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CONDITION SURVEY, MCCONNELL AIR FORCE BASE, KANSAS.(U)
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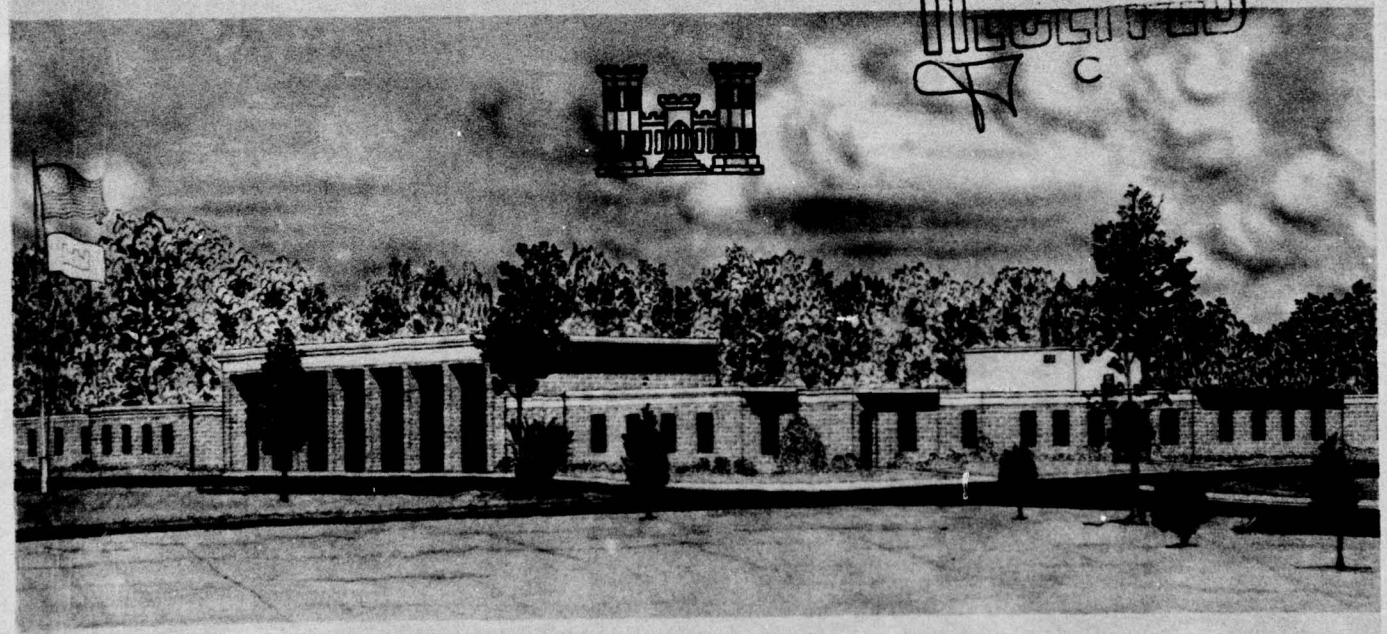
MISCELLANEOUS PAPER S-73-29

CONDITION SURVEY, McCONNELL AIR FORCE BASE, KANSAS

by

R. D. Jackson



May 1973

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Conducted by U. S. Army Engineer Waterways Experiment Station
Soils and Pavements Laboratory
Vicksburg, Mississippi

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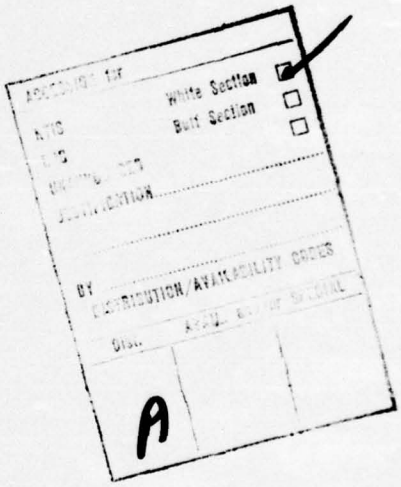
(9) MISCELLANEOUS PAPER S-73-29

CONDITION SURVEY, McCONNELL AIR FORCE BASE, KANSAS,

by

(10) R. D. Jackson

(12) 25p.



(11) May 1973

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Vicksburg, Mississippi

Foreword

The study reported herein was conducted under the general supervision of the Engineering Design Criteria Branch, Soils and Pavements Laboratory, of the U. S. Army Engineer Waterways Experiment Station (WES), Vicksburg, Mississippi. Personnel involved in the condition survey were Messrs. R. D. Jackson, K. A. O'Connor, and S. R. Rowland, Jr., of the WES and Mr. R. A. Eaton of the U. S. Army Cold Regions Research and Engineering Laboratory (CRREL), Hanover, New Hampshire. The main portion of this report was prepared by Mr. Jackson under the general supervision of Messrs. J. P. Sale, R. G. Ahlvin, R. L. Hutchinson, and P. J. Vedros of the Soils and Pavements Laboratory. The section of this report concerning frost action was prepared by Mr. Eaton and by Mr. G. D. Gilman of CRREL.

COL Ernest D. Peixotto, CE, was Director of the WES during the conduct of the study and preparation of the report. Mr. F. R. Brown was Technical Director.

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Conversion Factors, British to Metric Units of Measurement

British units of measurement used in this report can be converted to metric units as follows:

Multiply	By	To Obtain
inches	2.54	centimeters
feet	0.3048	meters
miles (U. S. statute)	1.609344	kilometers
square inches	6.4516	square centimeters
pounds (mass)	0.45359237	kilograms
pounds (force) per square inch	0.6894757	newtons per square centimeter
Fahrenheit degrees	*	Celsius or Kelvin degrees

* To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use the following formula: $C = (5/9)(F - 32)$. To obtain Kelvin (K) readings, use: $K = (5/9)(F - 32) + 273.15$.

CONDITION SURVEY, McCONNELL AIR FORCE BASE, KANSAS

Authority

1. Authority for conducting condition surveys at selected airfields is contained in amendment to FY 1972 RDTE Funding Authorization (MFS-MC-5, 16 February 1972), subject: "Air Force Airfield Pavement Research Program," from the Office, Chief of Engineers, U. S. Army, Directorate of Military Construction, dated 18 February 1972.

Purpose and Scope

2. The purpose of this report is to present the results of a condition survey performed at McConnell Air Force Base (MAFB), Kansas, during 8-12 May 1972. The following three major areas of interest were considered in this condition survey:

(1) The structural condition of the primary airfield pavements.

(2) The condition of pavement repairs and the types of maintenance materials that have been used at this airfield.

(3) Any detrimental effects of frost action to the pavement facilities.

3. This report is limited to a presentation of visual observations of the pavement conditions, discussion of these observations, and pertinent remarks with regard to the performance of the pavements. No physical tests of the pavements, foundations, or patching materials were performed during this survey.

Pertinent Background Data

General description of airfield

4. MAFB is located in Sedgwick County, Kansas, approximately 5 miles* southeast of Wichita, Kansas. A vicinity map is shown in plate 1.

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* A table of factors for converting British units of measurement to metric units is presented on page vii.

5. In May 1972, the airfield facilities consisted of parallel NE-SW runways (18L-36R and 18R-36L), two parallel taxiways, an apron taxiway, connecting taxiways, three warm-up aprons, and a large parking apron. The 18L-36R runway was 300 ft wide and 12,000 ft long. The 18R-36L runway was 200 ft wide and 12,000 ft long. The taxiways were 75 ft wide and of various lengths. The parking apron was 775 ft wide and approximately 4,860 ft long. A layout of the airfield and a pavement plan indicating the type pavement on each facility are shown in plate 1.

Previous reports

6. Previous reports concerning the facilities at MAFB are listed below. Pertinent data were extracted from them for use in this condition survey report.

a. Condition survey reports:

(1) Ohio River Division Laboratories, CE, "Report on Rigid Pavement Condition Survey, McConnell AFB, Kansas," September 1956, Cincinnati, Ohio.

(2) Missouri River Division Laboratory, CE, "Rigid Pavement Condition Survey, McConnell AFB, Wichita, Kansas," 1959, Omaha, Nebraska.

b. Pavement evaluation reports.

(1) U. S. Army Engineer District, Kansas City, CE, "Evaluation Report, McConnell Air Force Base, Kansas," Kansas City, Missouri.

(2) _____, "Airfield Evaluation Report, McConnell Air Force Base, Wichita, Kansas," March 1959, Kansas City, Missouri.

History of Airfield Pavements

Design and construction history

7. Details of the construction history (since 1949) of the airfield pavements (extracted from the reports referenced in paragraph 6) are presented in table 1. Records of construction at the airfield prior to 1950 are incomplete; however, the previous reports indicate that the 10-in. portland cement concrete (PCC) pavements were constructed in 1943. Pavement thicknesses, descriptions, and other details are presented in table 2.

8. No record of the design criteria for the original pavements was available; however, the pavements constructed during 1943 were designed to support operations of the B-29 aircraft that were being produced at the Boeing plant. From the time of the construction and reconstruction in 1955, the airfield pavements have been designed to support a landing-gear loading of 100,000 lb supported on dual wheels spaced 37.5 in. center to center, with each wheel having a tire contact area of 267 sq in.

Traffic history

9. Since 1955, MAFB has been used primarily as a pilot training base. During the period 1955-58, the airfield received approximately 3,500 cycles* per month of B-47 traffic. During the next 5 yr (1958-63), there were approximately 2,800 cycles of B-47 traffic per month. Since July 1963, the airfield has been used primarily for fighter pilot training. The estimated number of monthly cycles for all aircraft since this time is 2,400. The heavier aircraft included in this number of cycles are B-52's, KC-135's, 707's, and 727's; however, the KC-135 is the only aircraft presently using the field to any great extent (120 cycles per month since July 1971). Traffic at the base is about equally divided between the two runways, and more than 50 percent of the take-offs and landings are from the north ends of the runways.

Conditions of Pavement Surfaces

Pavement inspection procedure

10. The following procedure was used in conducting the inspection of the rigid pavements. Representative features were selected for detailed inspection. The features were then inspected slab** by slab, and the defects were recorded. The locations of the individual pavement features, the inspection starting points, and the directions in which the pavements were inspected (shown by arrows) are indicated in plate 1.

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* A cycle of operation is one landing and one takeoff.

** A slab is the smallest unit, containing no joints, of a given pavement feature.

The results of the rigid pavement survey for those features that were inspected in detail are presented in table 3. This table shows a quantitative breakdown of the various types of defects and a condition rating for each pavement feature inspected in detail. The procedures used for determining the condition rating of a pavement are given in Appendix III of Department of the Army Technical Manual TM 5-827-3, "Rigid Airfield Pavement Evaluation," dated September 1965.

Runways

11. The 18L-36R runway was in very good to excellent condition, with only limited major defects recorded. This runway contained many spalls that were a result of "D" cracking* at the corners and edges of the slabs. The 18R-36L runway was also in very good to excellent condition based on the percentage of slabs containing no major defects.

Taxiways

12. All the primary taxiways were in very good condition; however, each contained numerous spalls that were results of "D" cracking.

Aprons

13. The aprons surveyed contained numerous spalls but were considered to be in very good to excellent condition.

14. Those pavements not surveyed in detail were considered to be in good to excellent condition. However, there were a considerable number of spalls in these areas, and practically all of the slabs contained some degree of "D" cracking.

Frost Action

Objectives of inspection

15. One member of the team inspected the pavement facilities for

* "D" cracking is defined in Bulletin 47 of the Highway Research Board, "Salvaging Old Pavement by Resurfacing," as follows: "A form of disintegration characterized by the successive formation of a series of fine cracks at rather close intervals paralleling edges, joints, and cracks and usually curving across slab corners, the initial cracks forming very close to slab edge and additional cracks progressively developing, each a little farther from the edge than the preceding one. Ordinarily the cracks are filled with a calcareous deposit."

evidence of detrimental frost effects. The objectives of the inspection were to determine:

a. Any adverse effects of frost heave to the pavements during the winter months.

b. Any traffic-induced failures that might be related to thaw weakening of the subgrades or base courses.

c. Any adverse effects of low-temperature contraction cracking to the flexible pavements.

Frost heave

16. Since the inspection was conducted during the period 8-11 May, which was approximately 3 months after the end of the 1971-72 thawing period, evidence of any adverse effects of differential frost heaving could be determined only by an inspection of the pavements for surface irregularities. All of the pavements, including the nontraffic areas, were inspected in this respect, but no evidence of marked differential frost heaving was observed. Personnel of the Base Civil Engineering Office reported that no undesirable pavement surface roughness had developed during the winter months.

Freezing indices

17. A design freezing index of 365 degree-days has been determined for MAFB. This value is based on temperature data from the Wichita, Kansas, Airport Weather Station and is the average of the three coldest winters in the past 30 years (1948-49, 1961-62, and 1962-63). In the design index determination, average monthly temperatures were used for months entirely within the freezing seasons and average daily temperatures were considered for the transition months at both ends of the freezing seasons.

18. Seasonal indices for Wichita since 1955, when B-47 aircraft began operations (approximately 3500 cycles per month), are tabulated below. These indices, which were determined entirely from average monthly temperatures, do not properly account for the below freezing portions of the two transition months and generally reflect somewhat lower numerical values than do indices which consider average daily temperatures for these two periods. The tabulated indices do, however, indicate the relative severity of winters during B-47 aircraft operations at MAFB.

Freezing Season	Freezing Index degree-days	Freezing Season	Freezing Index degree-days
1955-56	78	1964-65	25
1956-57	174	1965-66	115
1957-58	64	1966-67	0
1958-59	171	1967-68	0
1959-60	130	1968-69	99
1960-61	19	1969-70	146
1961-62	279	1970-71	189
1962-63	304	1971-72	155
1963-64	167		

19. The existing pavements at MAFB provide a maximum thickness of protection over the subgrade of 23 in., which is not sufficient to prevent subgrade frost penetration during a design year in excess of the depth allowable in accordance with limited subgrade frost-penetration design criteria. Most of the PCC pavements, which range from 13 to 17 in. in thickness, were constructed directly on the clay subgrade. Thus, frost penetration into this material occurs during most years, and a substantial amount of penetration probably occurs during the colder years. Therefore, pavement design and performance must be compared with the reduced subgrade strength design and evaluation criteria.

Groundwater

20. Personnel of the Base Civil Engineering Office reported that the groundwater table is located at a depth of approximately 8 ft during the fall and winter months.

Low-temperature contraction cracking

21. Although the winters in this vicinity are usually mild, the area is subject to frequent and abrupt temperature changes. While these changes generally prevent large freezing index accumulations, below zero readings are not uncommon. The extreme low temperature on record at the Wichita Weather Station is -22 F. Only the overruns and shoulders at MAFB are of flexible pavement construction (2-in. asphaltic concrete (AC)), and all of these areas had low-temperature contraction cracks. At the time of this survey, both overruns of the primary runway and the south overrun of runway 18L-36R had numerous longitudinal and transverse cracks. Cracking on the north overrun of runway 18L-36R was relatively minor. In most areas, the taxiway shoulders had transverse cracks

spaced at 6- to 8-ft intervals, with longitudinal cracks in the center.

Thaw weakening

22. The extent of thaw weakening of underlying materials could not be readily determined by inspection of pavements. Pavement failures usually are repaired or otherwise corrected as they occur and usually are not easily examined during a condition survey. At MAFB, the primary type of pavement distress noted was spalling, which was attributed to "D" cracking. Extensive repairs have been made to slab corners and longitudinal joints that have been affected by this type of distress (see paragraphs 11-14 and photos 1-3). Although "D" cracking cannot be related to thaw weakening, it is possible that some of the failures (such as corner breaking) were due to overloading during the thawing period. Under similar traffic conditions, distress due to overloading is accelerated during and following the thawing of underlying frost-susceptible materials. However, the absence of distress (other than low-temperature contraction cracking) on the shoulder pavements suggests that significant thaw weakening has not occurred at MAFB despite the presence of a frost-susceptible subgrade within the depth of the seasonal frost penetration.

23. Rigid pavements. The primary rigid pavement slab thicknesses are adequate for "normal" period operations of the present Air Force medium-load aircraft, except for a slight deficiency (1 in.) for traffic area A slabs (see plate 1). However, for frost condition operations under the same loadings, the traffic area A and B pavement slabs are from 3 to 5 in. deficient in thickness, while the area C pavements are still adequate (except for a portion of runway 18L-36R interior (feature R6C), which has 13-in.-thick slabs). The reduced subgrade strength design criteria specify, however, that, in areas where subgrade conditions are uniform and the design freezing index is less than 1000, a minimum base thickness of 4 in. must be used. Yet all of the rigid pavements at MAFB have been constructed directly on the subgrade, except for two taxiways (features T3A and T4A) and two aprons (features A1B and A2B), which have 6-in. sand bases. The field has not been subjected to B-52 traffic to any extent (see paragraph 9); and, as is indicated by

the capacities shown in table 4, operations of this aircraft at normal gross weights would significantly overload the pavements for either the normal or the frost-melting periods.

24. Flexible pavements. The 2-in. AC pavement of the overruns and shoulders is adequate for the loads imposed; however, the base course thicknesses (4 to 13 in.) are insufficient for either the limited subgrade frost-penetration design or reduced subgrade strength design. Despite the deficiency, however, no distress other than the low-temperature contraction cracking mentioned above was noted during this survey.

Maintenance

25. The pavements at MAFB require yearly maintenance to repair surface spalls that result from "D" cracking. The depth of the deteriorated pavement removed is usually about 2 in. near the interior of a slab tapering to a depth of approximately 6 to 8 in. at the edge of a slab. A slab is repaired using an epoxy cement and PCC to replace the deteriorated section. In most of the apron areas, the deteriorated pavement has been replaced with AC.

26. Maintenance costs at MAFB since FY 1957 are tabulated below:

Fiscal Year	Contract Costs	In-House Expenditures
1957	$ 28,000	Not available
1958	44,700	Not available
1959	229,000	Not available
1960	227,000	Not available
1961	119,800	Not available
1962	166,700	Not available
1963	136,100	Not available
1964	None	$ 82,200 (Estimated)
1965	None	68,700 (Estimated)
1966	175,000	70,800
1967	None	71,700
1968	None	104,595
1969	185,671	49,131
1970	345,780	52,955
1971	120,066	49,767
1972 (3 quarters)	61,927	46,874

27. Maintenance performed in addition to the repair of surface spalls has included replacing a considerable number of slabs, sealing joints, and slurry sealing the AC shoulder pavements.

Evaluation

28. A summary of the pavement evaluation is presented in table 4. Previously published pavement evaluations were updated to eliminate aircraft that are no longer in the Air Force inventory and to include aircraft that have been added to the inventory since the last pavement evaluation. The evaluation is based on the pavement thickness, flexural strength (PCC), base and subbase thickness and strength, strength of the subgrade (CBR or K value), and the structural condition of the pavement.

Conclusions

29. The following statements summarize the findings of this investigation:

a. The primary pavements were in very good to excellent condition based on the percentage of slabs containing no major defects.

b. Spalls caused by "D" cracking are a continuing maintenance problem.

c. Repair of spalls on the runways is accomplished using epoxy cement and PCC. Apron repairs are usually completed using AC.

d. Contraction cracks were noted in all AC pavements; however, the only AC pavements are shoulders and runway overruns, so the problem is not extensive.

e. Frost action has not been a major factor in causing pavement defects.

Table 1

Airfield Construction History*

Pavement Facility	Pavement Thickness in.	Pavement Type	Construction Year(s)
NE-SW (18L-36R) runway (150- by 2000-ft section of S end and 150- by 400-ft section of N end)	13 and 16	PCC	1950
NE-SW (18L-36R) runway (150- by 2000-ft section of S end)	15 and 17	PCC	1951
NE-SW (18L-36R) runway (reconstruction and widening to 300 ft	15 and 17	PCC	1955
NE-SW (18R-36L) runway	15 and 17	PCC	1953
NW-SE (12-30) runway	17-15	PCC	1953
Taxiways 3 and 8	17	PCC	1951
North and south taxiways	17	PCC	1951
Parking apron	17	PCC	1951
Parking apron extension	17	PCC	1957
Parking apron (reconstruction)	17	PCC	1954-55
Taxiway 1	17	PCC	1955
Taxiway 2	17	PCC	1954
Hangar aprons	17	PCC	1953
Nose dock aprons	15	PCC	1955

* Since 1949.

Table 2

SUMMARY OF PHYSICAL PROPERTY DATA

FACILITY			OVERLAY PAVEMENT			PAVEMENT			BASE			SUBGRADE		GENERAL CONDITION OF AREA CONSIDERED
FACILITY NUMBER AND IDENTIFICATION	LENGTH FT	WIDTH FT	THICK. IN.	DESCRIPTION	FLEX. STR PSI	THICK. IN.	DESCRIPTION	FLEX. STR PSI	THICK. IN.	CLASSIFICATION	CBR OR K	CLASSIFICATION	CBR OR K	
Runway 18L-36R, SW end; 1st 500 ft R1A	500	300				17	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 K_{25}	Excellent
Runway 18L-36R, SW end; 2nd 500 ft R2B	500	300				17	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 K_{25}	Excellent
Runway 18L-36R interior R3C	10,000	Varies				15	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 K_{25}	Excellent to very good
Runway 18L-36R interior R4C	500	150				16	Portland cement concrete	730				Clay (CH) Frost group F3	75 K_{25}	Very good
Runway 18L-36R interior R5C	2,000	50				16	Portland cement concrete	730				Clay (CL) Frost group F3	75 K_{25}	Very good
Runway 18L-36R interior R6C	2,000	100				13	Portland cement concrete	730				Clay (CL) Frost group F3	75 K_{25}	Very good
Runway 18L-36R, NE end; 1st 500 ft R8A	500	Varies				17	Portland cement concrete	730				Clay (CL) Frost group F3	75 K_{25}	Very good
Runway 18L-36R, NE end; 1st 500 ft R9A	400	150				16	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 K_{25}	Very good
Runway 18L-36R, NE end; 2nd 500 ft R10B	500	300				17	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 K_{25}	Good
Runway 12-30 R7C	8,000	200				17-15	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 K_{25}	Good
Runway 18R-36L, SW end; 1st 500 ft R11A	500	200				17	Portland cement concrete	730				Clay (CL) Frost group F3	75 K_{25}	
Runway 18R-36L, SW end; 2nd 500 ft R12B	500	200				17	Portland cement concrete	730				Clay (CL) Frost group F3	75 K_{25}	
Runway 18R-36L interior R13C	10,000	200				15	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 K_{25}	
Runway 18R-36L, NE end; 1st 500 ft R14A	500	200				17	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 K_{25}	
Runway 18R-36L, NE end; 2nd 500 ft R15B	500	200				17	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 K_{25}	

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MAR 1958

Table 2 (Continued)

SUMMARY OF PHYSICAL PROPERTY DATA

FACILITY			OVERLAY PAVEMENT			PAVEMENT			BASE			SUBGRADE		GENERAL CONDITION OF AREA CONSIDERED
FACILITY NUMBER AND IDENTIFICATION	LENGTH FT	WIDTH FT	THICK. IN.	DESCRIPTION	FLEX. STR PSI	THICK. IN.	DESCRIPTION	FLEX. STR PSI	THICK. IN.	CLASSIFICATION	CBR OR K	CLASSIFICATION	CBR OR K	
Taxiway 1 T1A	5,140	75				10-17-10-15-17	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 $K_{\infty}25$	Very good
Taxiway 3 T2A	3,380	Varies				17	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 $K_{\infty}25$	Very good
South taxiway and taxiway 8 T3A	6,720	Varies				17	Portland cement concrete	730	6	Sand		Clay (CL) Frost group F3	75 $K_{\infty}35$	Very good
Taxiway 5 T4A	5,925	75				17	Portland cement concrete	730	6	Sand		Clay (CL-CH) Frost group F3	75 $K_{\infty}35$	Excellent
North taxiway T5A	1,550	Varies				17	Portland cement concrete	730				Clay (CL) Frost group F3	75 $K_{\infty}25$	Very good
Taxiway 2 (center lane) T6A	6,090	Varies				17	Portland cement concrete	730				Clay (CL) Frost group F3	75 $K_{\infty}25$	
Taxiway 2 (outside lanes) T7A	8,800	25				10-15	Portland cement concrete	730				Clay (CL) Frost group F3	75 $K_{\infty}25$	
Parking apron A1B	4,935	775				17	Portland cement concrete	730	6	Sand		Clay (CL-CH) Frost group F3	75 $K_{\infty}35$	Excellent
South warm-up apron C A2B	1,000	225				17	Portland cement concrete	730	6	Sand		Clay (CL) Frost group F2	75 $K_{\infty}35$	Very good
South warm-up apron B A3B	440	250				17	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 $K_{\infty}25$	Excellent
North warm-up apron A A4B	280	250				17	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 $K_{\infty}25$	Excellent
Hangar apron A5B	200	115				15	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 $K_{\infty}25$	Excellent
Hangar apron A6B	225	150				15	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 $K_{\infty}25$	
Hangar apron A7B	700	520				17	Portland cement concrete	730				Clay (CL-CH) Frost group F3	75 $K_{\infty}25$	

Table 3

DATE: 9 May 1972

SUMMARY OF DATA - RIGID PAVEMENT CONDITION SURVEY

AIRFIELD: McConnell AFB, Kansas

FEATURE NO.	FEATURE DESIGNATION	SLAB SIZE FT	APPROX NO. OF SLABS	PAVE. THICK. IN.	NO. OF SLABS CONTAINING INDICATED DEFECTS																% OF SLABS NO DEFECTS	% OF SLABS NO MAJOR DEFECTS	CONDITION
					I	—	\	Δ	*	K	~	S	J	↓	J	⊕	M	P	O	C	D			
R1A	Runway 18L-36R, SW end; 1st 500 ft	25x25	240	17		1	1	1			1	1	3	1	8		2		26			82.5	99.2	Excel-lent
R2B	Runway 18L-36R, SW end; 2nd 500 ft	25x25	240	17	1			1			2		2		4				15			90.4	99.2	Excel-lent
R3C	Runway 12-30 (now part of runway 18L-36R*)	25x25	168	15				1				3	4	1	6				16			81.5	99.4	Excel-lent
R3C R4C R5C R6C	Runway 18L-36R interior	25x25	4692	13,15, and 16	73	12	40	12			24	2	8	17	121				359	1		86.5	97.3	Very good
R8A R9A	Runway 18L-36R, NE end; 1st 500 ft	25x25	240	17 16	3	1	2	1					1	2	11				15			86.3	97.5	Very good
R10B	Runway 18L-36R, NE end; 2nd 500 ft	25x25	240	17	7	3					3		2	3	3				13			89.2	97.1	Very good
R14A	Runway 18R-36L, NE end; 1st 500 ft	25x25	160	17	1		1				2		1		6		2		25			85.4	98.8	Excel-lent
R15B	Runway 18R-36L, NE end; 2nd 500 ft	25x25	160	17							1		1	1	9				14			87.9	100.0	Excel-lent
R13C	Runway 18R-36L interior	25x25	3200	15	62	1		12			55	1	7	23	159		18		154			88.0	97.7	Very good
R11A	Runway 18R-36L, SW end; 1st 500 ft	25x25	160	17	1			1			3			1	6				3			90.6	98.8	Excel-lent

REMARKS: * Eight replaced slabs.

LEGEND:

I	LONGITUDINAL CRACK	~	SHRINKAGE CRACK	M	MAP CRACKING
—	TRANSVERSE CRACK	S	SCALING	P	PUMPING JOINT
\	DIAGONAL CRACK	J	SPALL ON TRANSVERSE JOINT	O	POP-OUT
Δ	CORNER BREAK	↓	SPALL ON LONGITUDINAL JOINT	C	UNCONTROLLED CONTRACTION CRACK
*	SHATTERED SLAB	J	CORNER SPALL	D	"D" CRACKING
K	KEYED JOINT FAILURE	⊕	SETTLEMENT		

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JUN 1972

(1 of 3 sheets)

Table 3 (Continued)

DATE: 9 May 1972

SUMMARY OF DATA - RIGID PAVEMENT CONDITION SURVEY

AIRFIELD: McConnell AFB, Kansas

FEATURE NO.	FEATURE DESIGNATION	SLAB SIZE FT	APPROX NO. OF SLABS	PAVE. THICK. IN.	NO. OF SLABS CONTAINING INDICATED DEFECTS																	% OF SLABS NO DEFECTS	% OF SLABS NO MAJOR DEFECTS	CONDITION
					I	—	\	Δ	*	K	~	S	J	↓	J	⊕	M	P	O	C	D			
R12B	Runway 18R-36L, SW end; 2nd 500 ft	25x25	160	17	1						1				4				8			91.3	99.4	Excel-lent
T1A	Taxiway 1	25x25	1595	10-17-10-15-17	14	15	7	21			12	1	14	29	168		5		77	10		75.4	95.8	Very good
T2A	Taxiway 3	25x25	387	17	12	4	3	5			8		22	17	43		1		60			80.5	93.8	Very good
T3A	South taxiway and taxiway 8	25x25	1114	17	25	2	7	21			22		10	51	155				63			77.9	96.4	Very good
T4A	Taxiway 5	25x25	711	17	2		1	3			6		14	49	43				21			82.4	99.2	Excel-lent
T5A	North taxiway	25x25	188	17	7	1		8			4		4	22	28				10	1		81.4	93.6	Very good
A1B	Parking apron	25x25	5549	17	32	8	16	15			115	5	68	29	407		201		384	2		79.8	98.7	Excel-lent
A2B	South warm-up apron C	25x25	361	17	2	7	5	4			9		2	1	39				36			73.1	95.3	Very good
A3B	South warm-up apron B	25x25	216		1			1					1	6	35				28	2		72.7	99.1	Excel-lent
A4B	North warm-up apron A	25x25	145	17	1	1					1		13		15				6	1		76.6	98.6	Excel-lent

REMARKS:

LEGEND:

I	LONGITUDINAL CRACK	~	SHRINKAGE CRACK	M	MAP CRACKING
—	TRANSVERSE CRACK	S	SCALING	P	PUMPING JOINT
\	DIAGONAL CRACK	J	SPALL ON TRANSVERSE JOINT	O	POP-OUT
Δ	CORNER BREAK	↓	SPALL ON LONGITUDINAL JOINT	C	UNCONTROLLED CONTRACTION CRACK
*	SHATTERED SLAB	J	CORNER SPALL	D	"D" CRACKING
K	KEYED JOINT FAILURE	⊕	SETTLEMENT		

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JUN 1972

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Table 3 (Continued)

DATE: 9 May 1972

SUMMARY OF DATA - RIGID PAVEMENT CONDITION SURVEY

AIRFIELD: McConnell AFB, Kansas

FEATURE NO.	FEATURE DESIGNATION	SLAB SIZE FT	APPROX NO. OF SLABS	PAVE. THICK. IN.	NO. OF SLABS CONTAINING INDICATED DEFECTS																% OF SLABS NO DEFECTS	% OF SLABS NO MAJOR DEFECTS	CONDITION
					I	—	\	Δ	*	K	~	S	J	↓	J	⊕	M	P	O	C	D			
A5B	Hangar apron	25x25	140	15 to 17				1					3	6	16				7			76.4	99.3	Excel-lent

REMARKS:

LEGEND:

I	LONGITUDINAL CRACK	~	SHRINKAGE CRACK	M	MAP CRACKING
—	TRANSVERSE CRACK	S	SCALING	P	PUMPING JOINT
\	DIAGONAL CRACK	J	SPALL ON TRANSVERSE JOINT	O	POP-OUT
Δ	CORNER BREAK	↓	SPALL ON LONGITUDINAL JOINT	C	UNCONTROLLED CONTRACTION CRACK
*	SHATTERED SLAB	J	CORNER SPALL	D	"D" CRACKING
K	KEYED JOINT FAILURE	⊕	SETTLEMENT		

WES FORM NO. 2004
JUN 1972

(3 of 3 sheets)

Table 4

SUMMARY OF PAVEMENT EVALUATION

NAME OF AIRFIELD: McConnell AFB

DATE OF EVALUATION MONTH: May YR: 1972

FEATURE NO.	FEATURE DESIGNATION	PAVEMENT OPERATIONAL USE	LOAD-CARRYING CAPACITY IN LB OF GROSS PLANE LOAD FOR INDICATED LANDING GEAR TYPES AND CONFIGURATIONS										REMARKS
			TRICYCLE ARRANGEMENT									BICYCLE	
			SINGLE 100-PSI TIRE PRESSURE	SINGLE 100-SQ-IN. CONTACT AREA	SINGLE 241-SQ-IN. CONTACT AREA	TW 28-IN. C-C 226-SQ-IN. CONTACT AREA EACH TIRE	SINGLE TANDEM 60-IN. SPACING 400-SQ-IN. CONTACT AREA	TW 37-IN. C-C 267-SQ-IN. CONTACT AREA EACH TIRE	TW 44-IN. C-C 630-SQ-IN. CONTACT AREA EACH TIRE	TWIN TANDEM 33 IN. × 48 IN. 208-SQ-IN. CONTACT AREA EACH TIRE	C-5A GEAR CONFIGURATION	TWIN TWIN SPCG 37-62-37 267-SQ-IN. CONTACT AREA EACH TIRE	
			1	2	3	4	5	6	7	8	9	10	
R1A	Runway 18L-36R, SW end; 1st 500 ft	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	200,000	230,000+	330,000	800,000+	295,000	
		Frost capacity	140,000	85,000+	155,000	185,000	200,000+	200,000	230,000	300,000	800,000+	250,000	
R2B	Runway 18L-36R, SW end; 2nd 500 ft	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	240,000	230,000+	380,000+	800,000+	310,000	
		Frost capacity	140,000	85,000+	155,000+	185,000	200,000+	200,000	230,000+	300,000	800,000+	250,000	
R3C	Runway 18L-36R interior (15-in. PCC)	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	270,000	230,000+	380,000+	800,000+	350,000	
		Frost capacity	150,000	85,000+	155,000+	200,000	200,000+	220,000	230,000+	340,000	800,000+	280,000	
R4C R5C	Runway 18L-36R interior (16-in. PCC)	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	290,000	230,000+	380,000+	800,000+	380,000	
		Frost capacity	155,000+	85,000+	155,000	220,000	200,000+	245,000	230,000+	370,000	800,000+	310,000	
R6C	Runway 18L-36R interior (13-in. PCC)	Capacity	140,000	85,000+	155,000+	195,000	200,000+	220,000	230,000+	370,000	800,000+	290,000	
		Frost capacity	120,000	85,000+	155,000+	165,000	200,000+	180,000	225,000	285,000	800,000+	230,000	
R8A	Runway 18L-36R, NE end; 1st 500 ft (17-in. PCC)	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	200,000	230,000+	330,000	800,000+	295,000	
		Frost capacity	140,000	85,000+	145,000	185,000	200,000+	170,000	210,000	255,000	740,000	235,000	
R9A	Runway 18L-36R, NE end; 1st 500 ft (16-in. PCC)	Capacity	145,000	85,000+	155,000	200,000	200,000+	185,000	230,000	300,000	800,000+	270,000	
		Frost capacity	130,000	85,000+	130,000	170,000	200,000	155,000	190,000	235,000	690,000	(a)	
R10B	Runway 18L-36R, SW end; 2nd 500 ft	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	240,000	230,000+	380,000+	800,000+	310,000	
		Frost capacity	140,000	85,000+	155,000+	185,000	200,000+	200,000	230,000+	300,000	800,000+	250,000	
R7C	Runway 12-30	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	270,000	230,000+	380,000+	800,000+	350,000	
		Frost capacity	140,000	85,000+	155,000+	200,000	200,000+	220,000	230,000+	340,000	800,000+	280,000	
R11A	Runway 18R-36L, SW end; 1st 500 ft	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	200,000	230,000+	330,000	800,000+	295,000	
		Frost capacity	140,000	85,000+	155,000+	185,000	200,000+	200,000	230,000+	300,000	800,000+	250,000	

Note: + sign denotes allowable gross loading greater than maximum gross weight of any existing aircraft having indicated gear configuration.
(a) denotes allowable gross loading less than minimum gross weight of any existing aircraft having indicated gear configuration.

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Table 4 (Continued)

SUMMARY OF PAVEMENT EVALUATION

NAME OF AIRFIELD: McConnell AFB DATE OF EVALUATION MONTH: May YR: 1972			LOAD-CARRYING CAPACITY IN LB OF GROSS PLANE LOAD FOR INDICATED LANDING GEAR TYPES AND CONFIGURATIONS										
			TRICYCLE ARRANGEMENT									BICYCLE	
FEATURE		PAVEMENT OPERATIONAL USE	SINGLE 100-PSI TIRE PRESSURE	SINGLE 100-SQ-IN. CONTACT AREA	SINGLE 241-SQ-IN. CONTACT AREA	TW 28-IN. C-C 226-SQ-IN. CONTACT AREA EACH TIRE	SINGLE TANDEM 60-IN. SPACING 400-SQ-IN. CONTACT AREA	TW 37-IN. C-C 267-SQ-IN. CONTACT AREA EACH TIRE	TW 44-IN. C-C 630-SQ-IN. CONTACT AREA EACH TIRE	TWIN TANDEM 33 IN. × 48 IN. 208-SQ-IN. CONTACT AREA EACH TIRE	C-5A GEAR CONFIGURATION	TWIN TWIN SPCG 37-62-37 267-SQ-IN. CONTACT AREA EACH TIRE	REMARKS
NO.	DESIGNATION		1	2	3	4	5	6	7	8	9	10	
R12B	Runway 18R-36L, SW end; 2nd 500 ft	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	240,000	230,000+	380,000+	800,000+	310,000	
		Frost capacity	140,000	85,000+	155,000+	185,000	200,000+	200,000	230,000+	300,000	800,000+	250,000	
R13C	Runway 18R-36L interior	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	270,000	230,000+	380,000+	800,000+	350,000	
		Frost capacity	150,000	85,000+	155,000+	200,000	200,000+	220,000	230,000+	340,000	800,000+	280,000	
R14A	Runway 18R-36L NE end; 2nd 500 ft	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	200,000	230,000+	330,000	800,000+	295,000	
		Frost capacity	140,000	85,000+	145,000	185,000	200,000+	170,000	210,000	255,000	740,000	235,000	
R15B	Runway 18R-36L NE end; 2nd 500 ft	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	240,000	230,000+	380,000+	800,000+	310,000	
		Frost capacity	140,000	85,000+	155,000+	185,000	200,000+	200,000	230,000+	300,000	800,000+	250,000	
T1A	Taxiway 1 15-in. PCC	Capacity	155,000+	85,000+	140,000	220,000	200,000+	200,000	230,000+	330,000	800,000+	295,000	
		Frost capacity	140,000	85,000+	120,000	185,000	200,000+	170,000	210,000	255,000	740,000	235,000	
T1A	Taxiway 1 17-in. PCC	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	270,000	230,000+	380,000+	800,000+	350,000	
		Frost capacity	150,000	85,000+	145,000	200,000	200,000+	220,000	230,000+	340,000	800,000+	280,000	
T2A	Taxiway 3	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	200,000	230,000+	330,000	800,000+	295,000	
		Frost capacity	140,000	85,000+	145,000	185,000	200,000+	170,000	210,000	255,000	740,000	235,000	
T3A	South taxiway and taxiway 8	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	200,000	230,000+	330,000	800,000+	295,000	
		Frost capacity	155,000+	85,000+	155,000+	195,000	200,000+	200,000	230,000+	330,000	800,000+	270,000	
T4A	Taxiway 5	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	200,000	230,000+	330,000	800,000+	295,000	
		Frost capacity	155,000+	85,000+	155,000+	195,000	200,000+	200,000	230,000+	330,000	800,000+	270,000	
T5A	North taxiway	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	200,000	230,000+	330,000	800,000+	295,000	
		Frost capacity	140,000	85,000+	145,000	185,000	200,000+	170,000	210,000	255,000	740,000	235,000	

Table 4 (Continued)

SUMMARY OF PAVEMENT EVALUATION

NAME OF AIRFIELD: McConnell AFB DATE OF EVALUATION MONTH: May YR: 1972			LOAD-CARRYING CAPACITY IN LB OF GROSS PLANE LOAD FOR INDICATED LANDING GEAR TYPES AND CONFIGURATIONS										
			TRICYCLE ARRANGEMENT									BICYCLE	
FEATURE		PAVEMENT OPERATIONAL USE	SINGLE 100-PSI TIRE PRESSURE	SINGLE 100-SQ-IN. CONTACT AREA	SINGLE 241-SQ-IN. CONTACT AREA	TW 28-IN. C-C 226-SQ-IN. CONTACT AREA EACH TIRE	SINGLE TANDEM 60-IN. SPACING 400-SQ-IN. CONTACT AREA	TW 37-IN. C-C 267-SQ-IN. CONTACT AREA EACH TIRE	TW 44-IN. C-C 630-SQ-IN. CONTACT AREA EACH TIRE	TWIN TANDEM 33 IN. × 46 IN. 208-SQ-IN. CONTACT AREA EACH TIRE	C-5A GEAR CONFIGURATION	TWIN TWIN SPCG 37-62-37 267-SQ-IN. CONTACT AREA EACH TIRE	REMARKS
NO.	DESIGNATION		1	2	3	4	5	6	7	8	9	10	
A1B	Parking apron	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	240,000	230,000+	380,000+	800,000+	310,000	
		Frost capacity	155,000+	85,000+	155,000+	195,000	200,000+	220,000	230,000+	350,000	800,000+	270,000	
A2B	South warm-up apron C	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	240,000	230,000+	380,000+	800,000+	310,000	
		Frost capacity	155,000+	85,000+	155,000+	195,000	200,000+	220,000	230,000+	350,000	800,000+	270,000	
A3B	South warm-up apron B	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	240,000	230,000+	380,000+	800,000+	310,000	
		Frost capacity	140,000	85,000+	155,000+	185,000	200,000+	200,000	230,000+	300,000	800,000+	250,000	
A4B	North warm-up apron A	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	240,000	230,000+	380,000+	800,000+	310,000	
		Frost capacity	140,000	85,000+	155,000+	185,000	200,000+	200,000	230,000+	300,000	800,000+	250,000	
A5B	Hangar apron	Capacity	130,000	85,000+	155,000+	180,000	200,000+	200,000	230,000+	320,000	800,000+	260,000	
		Frost capacity	115,000	85,000+	140,000	150,000	200,000+	165,000	200,000	255,000	730,000	(a)	
A6B	Hangar apron	Capacity	130,000	85,000+	155,000+	180,000	200,000+	200,000	230,000+	320,000	800,000+	260,000	
		Frost capacity	115,000	85,000+	140,000	150,000	200,000+	165,000	200,000	255,000	730,000	(a)	
A7B	Hangar apron	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	240,000	230,000+	380,000+	800,000+	310,000	
		Frost capacity	140,000	85,000+	155,000+	185,000	200,000+	200,000	230,000+	300,000	800,000+	250,000	

WES FORM NO. 999
JUNE 1972

EDITION OF AUG 1960 IS OBSOLETE.

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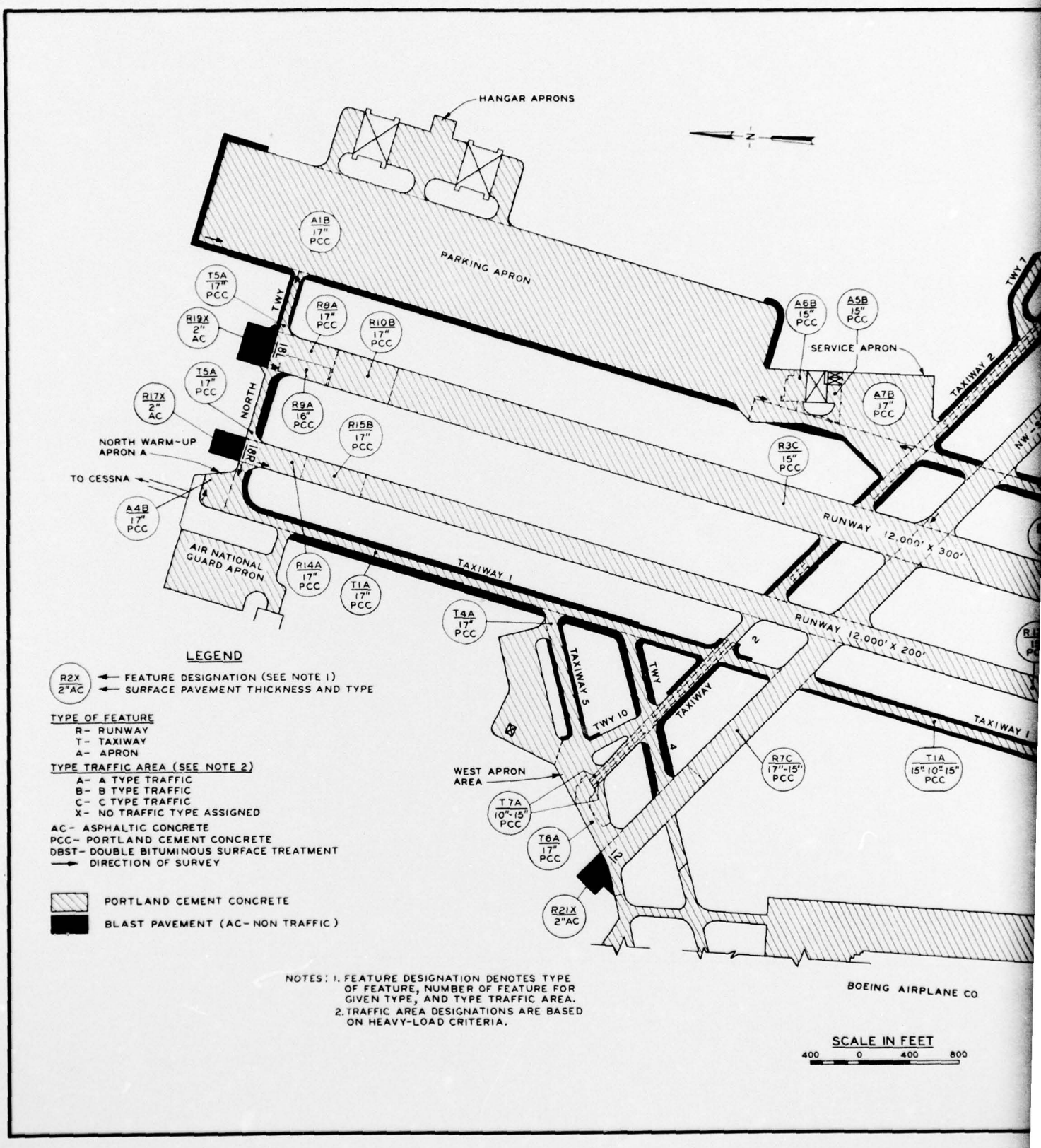
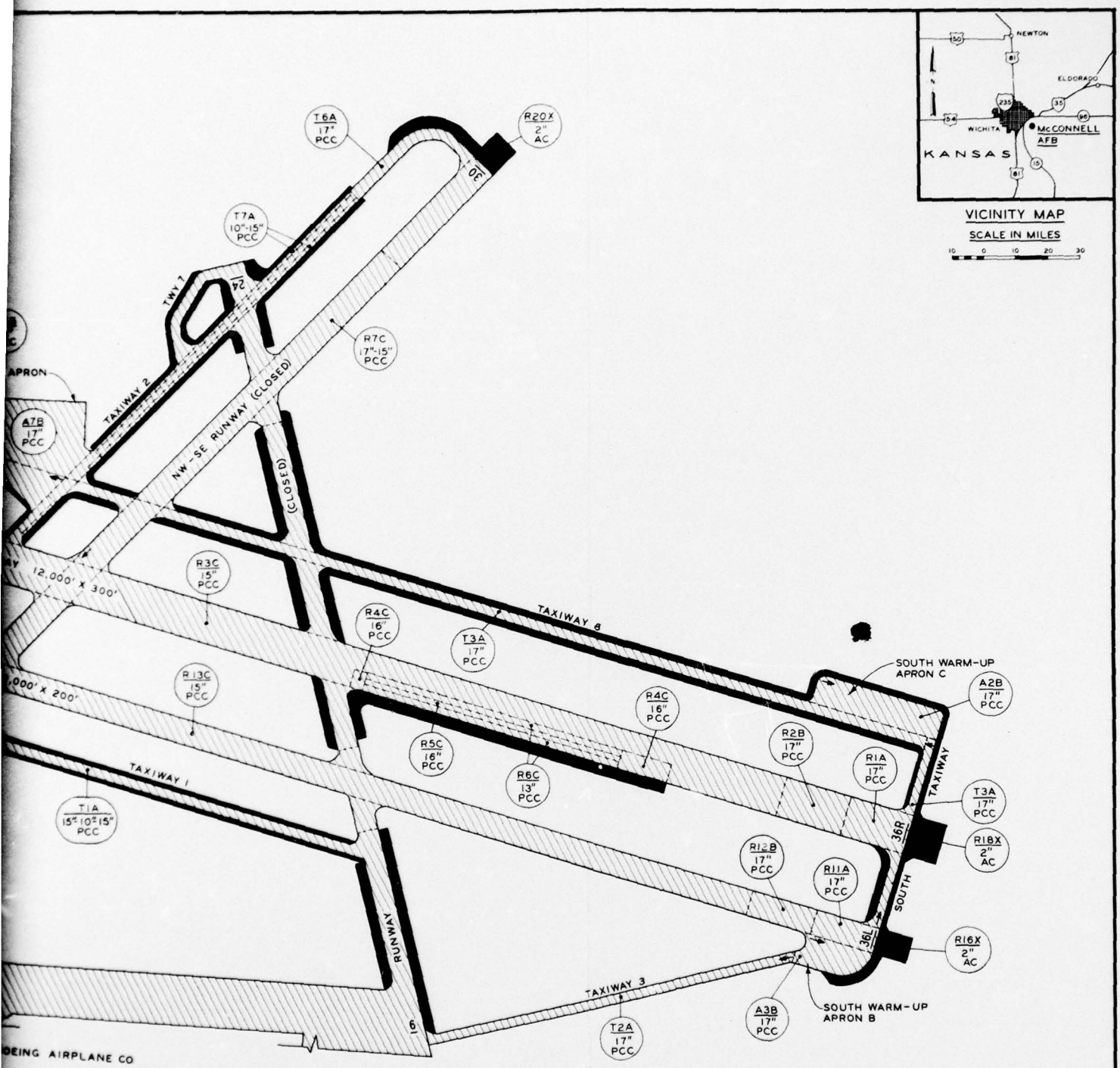

HANGAR APRONS
N
A1B 17" PCC
PARKING APRON
T5A 17" PCC
TWY
R8A 17" PCC
R10B 17" PCC
R19X 2" AC
T8I
T5A 17" PCC
NORTH
R9A 16" PCC
R15B 17" PCC
R17X 2" AC
NORTH WARM-UP APRON A
T8R
TO CESSNA
A4B 17" PCC
AIR NATIONAL GUARD APRON
R14A 17" PCC
T1A 17" PCC
TAXIWAY 1
T4A 17" PCC
A6B 15" PCC
A5B 15" PCC
SERVICE APRON
TWY 7
TAXIWAY 2
A7B 17" PCC
R3C 15" PCC
RUNWAY 12,000' X 300'
RUNWAY 12,000' X 200'
TAXIWAY 5
TWY 10
TWY
TAXIWAY
TAXIWAY 1
WEST APRON AREA
T7A 10"-15" PCC
T6A 17" PCC
R7C 17"-15" PCC
T1A 15"-10"-15" PCC
R21X 2" AC
LEGEND
R2X / 2" AC ← FEATURE DESIGNATION (SEE NOTE 1) ← SURFACE PAVEMENT THICKNESS AND TYPE
TYPE OF FEATURE
R- RUNWAY
T- TAXIWAY
A- APRON
TYPE TRAFFIC AREA (SEE NOTE 2)
A- A TYPE TRAFFIC
B- B TYPE TRAFFIC
C- C TYPE TRAFFIC
X- NO TRAFFIC TYPE ASSIGNED
AC- ASPHALTIC CONCRETE
PCC- PORTLAND CEMENT CONCRETE
DBST- DOUBLE BITUMINOUS SURFACE TREATMENT
→ DIRECTION OF SURVEY
PORTLAND CEMENT CONCRETE
BLAST PAVEMENT (AC- NON TRAFFIC)
NOTES: 1. FEATURE DESIGNATION DENOTES TYPE OF FEATURE, NUMBER OF FEATURE FOR GIVEN TYPE, AND TYPE TRAFFIC AREA.
2. TRAFFIC AREA DESIGNATIONS ARE BASED ON HEAVY-LOAD CRITERIA.
BOEING AIRPLANE CO
SCALE IN FEET
400 0 400 800



McCONNELL AFB

AIRFIELD LAYOUT AND PAVEMENT PLAN

PLATE 1

2