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MISCELLANEOUS PAPER S-69-47

CONDITION SURVEY SIMMONS ARMY AIRFIELD FT. BRAGG, NORTH CAROLINA

by

P. J. Vedros
W. B. Abbott, Jr.



October 1969

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Office, Chief of Engineers
U. S. Army

Conducted by

U. S. Army Engineer Waterways Experiment Station
CORPS OF ENGINEERS
Vicksburg, Mississippi

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H. B. ZACKRISON, SR.
Chief, Engineering Division
Military Construction

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Foreword

Authority for performance of condition surveys at selected airfields is contained in Long Range Program - O&M, A FY 1969 Project Q6-1: "Engineering Criteria for Design and Construction - WES," dated April 1968.

The inspection of the facilities at Simmons Army Airfield was requested by the Office, Chief of Engineers, and was made in February 1969 by Messrs. P. J. Vedros and W. B. Abbott, Jr., of the Flexible Pavement Branch, U. S. Army Engineer Waterways Experiment Station (WES). This report was prepared by Messrs. Vedros and Abbott under the general supervision of Messrs. A. A. Maxwell, R. G. Ahlvin, and A. H. Joseph of the Soils Division, WES.

COL Levi A. Brown, CE, was Director of the WES during the conduct of the study and preparation of this 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:

<u>Multiply</u>	<u>By</u>	<u>To Obtain</u>
inches	2.54	centimeters
feet	0.3048	meters
miles	1.609344	kilometers
pounds	0.45359237	kilograms
pounds per square inch	0.070307	kilograms per square centimeter

CONDITION SURVEY, SIMMONS ARMY AIRFIELD

FT. BRAGG, NORTH CAROLINA

Purpose

1. The purpose of this report is to present the results of an inspection at Simmons Army Airfield (SAAF) in February 1969. The inspection was limited to visual observations, and no tests were conducted on the existing runways and taxiways. A layout of the airfield is shown in plate 1.

Pertinent Background Data

General description of airfield

2. SAAF is located on the reservation of Ft. Bragg approximately 12 miles* northwest of Fayetteville, North Carolina.

3. The airfield is located physiographically in the Sandy Hills area of the Atlantic Coastal Plain province. The surface soils in the airfield area consist of poorly graded silty and clayey sands. The topography of the immediate vicinity is typical of this region, with low rounded hills and shallow valleys.

4. In February 1969, the airfield consisted of facilities for both fixed- and rotary-wing aircraft. The fixed-wing facilities are located on the eastern portion of the airfield and consist of one runway, 3600 ft long and 100 ft wide, surfaced with asphaltic concrete; parking aprons, both asphaltic and portland cement concrete; and taxiways (see plate 1). Rotary-wing facilities are located on the western portion of the airfield and consist of two portland cement concrete runways, varying in length and width, and portland cement concrete connecting taxiways and dispersed parking areas.

Previous report

5. The latest evaluation report pertaining to the load-carrying

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

capabilities of the pavement at SAAF is as follows:

U. S. Army Engineer District, Wilmington, "Army Airfield Pavement Evaluation, Simmons Army Airfield, Fort Bragg, North Carolina," September 1960, Wilmington, N. C.

Construction History of Airfield Pavements

6. Major pavement facilities have been constructed over the period of years from 1953 to 1965. The construction history is shown in table 1. For clarification in this report, the facilities have been assigned arbitrary numbers.

Original construction

7. The original construction in 1953 consisted of placing the subgrade and base course for the fixed-wing runway, parking apron 1, and taxiways 1, 2, and 3. The runway and taxiway 3 were surfaced with a single bituminous surface treatment. A small portion of the apron was treated with a dust palliative.

1956 construction

8. In 1956, the runway, parking apron 1, and taxiways 1, 2, and 3 were all surfaced with hot-mix asphaltic concrete: the pavement of the first 800 ft at each end of the runway was 3-1/2 in. thick; the pavement on the runway interior, parking apron 1, and taxiways 1, 2, and 3 was 2-1/2 in. thick.

1956-1957 construction

9. During this phase, parking apron 2, taxiways, and heliport runways were constructed of 8-in. portland cement concrete on a compacted subgrade. Flexible pavement shoulders were also constructed consisting of 1-in. asphaltic concrete and 6-in. stabilized base. The fixed-wing facilities constructed during this period were designed for a load of 22,000 lb on a single-wheel gear. The heliport facilities were designed for a load of 15,000 lb on a 200-psi single-wheel gear. All pavements were designed in accordance with the Engineering Manual for Military Construction, Part XII, Chapter 3 (now designated as TM 5-823-3).

1960 construction

10. In 1960, the existing parking apron 2 was extended, connecting

taxiways were widened, warm-up pads were constructed, and 15 dispersal parking pads were added; all were designed for strength comparable to that of existing pavement.

1963-1965 construction

11. In 1963, an 8-in. portland cement concrete hangar apron placed on a compacted subgrade was constructed adjacent to the future location of parking apron 3. Heliport facilities were enlarged in 1964. This included constructing a hangar apron area, lengthening and widening runway (6-24), and adding connecting taxiways, all constructed of 8-in. concrete on compacted subgrade. In 1965, parking apron 3 was constructed and consisted of 6-in. portland cement concrete placed over a compacted 6-in. clayey sand base.

Condition of Pavement Surfaces

12. A visual inspection in February 1969 indicated that the airfield pavements were generally in good condition. The surface of the 3600-ft-long asphalt concrete fixed-wing runway was slightly weathered, with unsealed longitudinal shrinkage cracks appearing on the surface at a few locations (photographs 1 and 2). The asphaltic concrete parking apron 1 and adjacent taxiways had recently been slurry-sealed (photograph 3). These areas are performing well, and little or no signs of deterioration were noted. The asphaltic concrete shoulder areas bordering the portland cement concrete heliport facilities had also been slurry-sealed. These areas showed little or no signs of deterioration (photograph 4). The joints between the asphalt and concrete pavements were generally well sealed.

13. A brief inspection was made of the portland cement concrete portions of the airfield. The concrete slabs appeared to be in good condition with only a minimum of cracking. The joints seemed to be adequately sealed and performing well (photograph 5).

Evaluation

14. Information on the strength properties of the pavements and

underlying materials was not available; therefore, no evaluation of the facilities could be made. It is understood that an evaluation of all pavement facilities is scheduled to be performed in the near future.

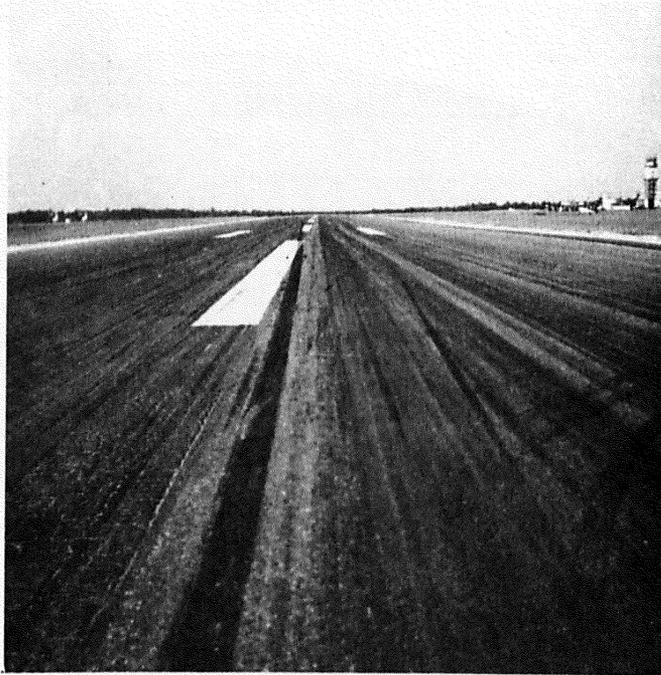
Table 1

Construction History

<u>Pavement Facility</u>	<u>Pavement Construction</u>			
	<u>Thickness</u> <u>in.</u>	<u>Type</u>	<u>Completion</u> <u>Date</u>	<u>Agency</u>
<u>Airfield</u>				
E-W (9-27) runway (first 500-ft ends)	19	AC	1956	Troop built
E-W (9-27) runway (interior portion)	17-1/2	AC	1956	Troop built
Taxiways 1, 2, and 3	17-1/2	AC	1956	Troop built
Parking apron 1	17-1/2	AC	1956	Troop built
Warm-up aprons	8	PCC	1960	CE
Parking apron 2	8	PCC	1957	CE
Parking apron extension (adjacent to parking apron 2)	8	PCC	1960	CE
Parking apron 3	6	PCC	1965	CE
Hangar apron (adjacent to parking apron 2)	8	PCC	1957	CE
Hangar apron (adjacent to parking apron 3)	8	PCC	1963	CE

Table 1 (Concluded)

<u>Pavement Facility</u>	<u>Pavement Construction</u>			<u>Agency</u>
	<u>Thickness</u> <u>in.</u>	<u>Type</u>	<u>Completion</u> <u>Date</u>	
	<u>Heliport</u>			
Runways and taxiways	8	PCC	1957	CE
Runway (6-24) lengthen	8	PCC	1964	CE
Taxiway widening	8	PCC	1960	CE
Dispersed parking pads (along south taxiway)	8	PCC	1957	CE
Dispersed parking pads (along north taxiway)	8	PCC	1960	CE
Hangar apron	8	PCC	1964	CE



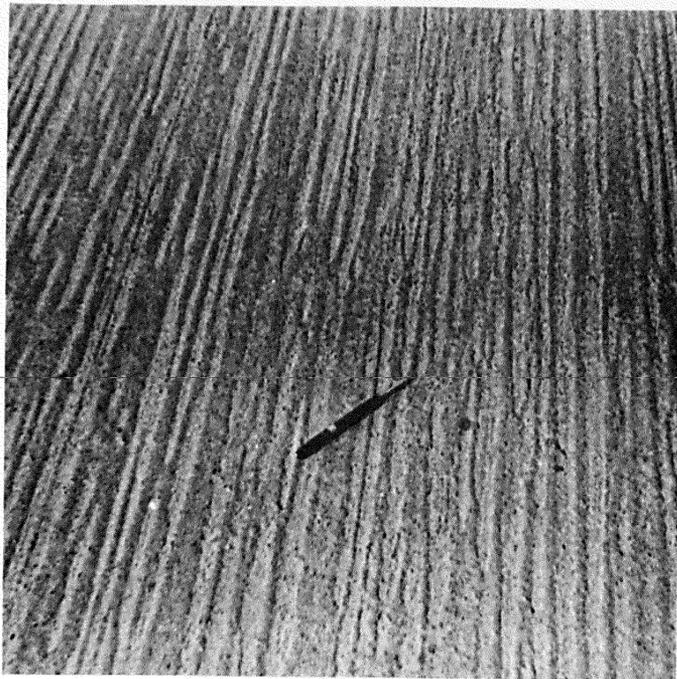
Photograph 1. General condition of the asphaltic concrete-fixed-wing runway



Photograph 2. Unsealed crack in pavement of fixed-wing runway



Photograph 3. General condition typical
of the slurry-sealed taxiways



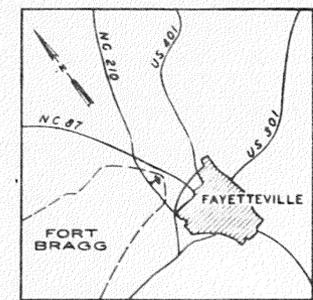
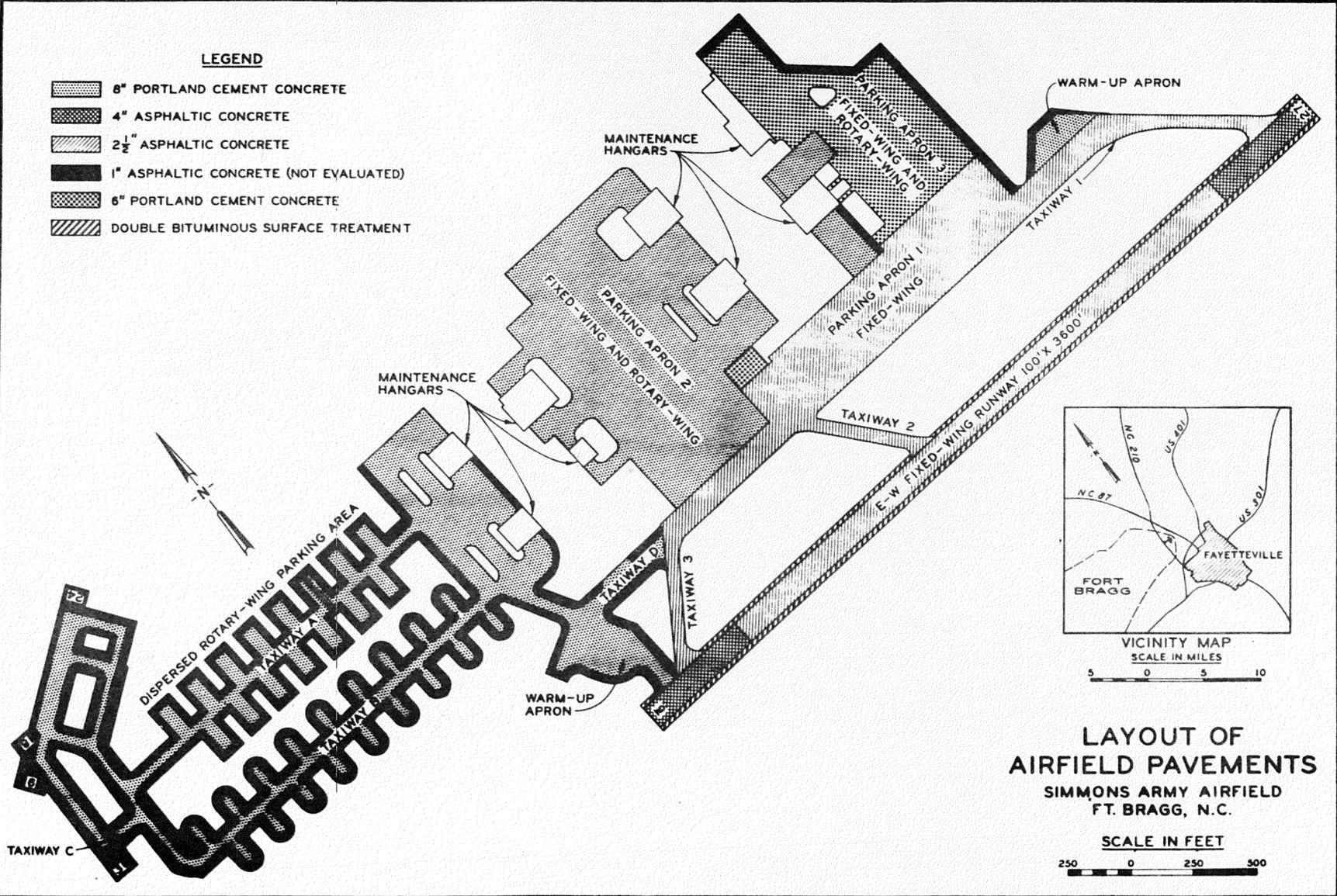
Photograph 4. Typical view of the
slurry-sealed shoulder area



Photograph 5. View of concrete rotary-wing
runway (6-24)

LEGEND

-  6" PORTLAND CEMENT CONCRETE
-  4" ASPHALTIC CONCRETE
-  2 1/2" ASPHALTIC CONCRETE
-  1" ASPHALTIC CONCRETE (NOT EVALUATED)
-  6" PORTLAND CEMENT CONCRETE
-  DOUBLE BITUMINOUS SURFACE TREATMENT



VICINITY MAP
SCALE IN MILES



**LAYOUT OF
AIRFIELD PAVEMENTS
SIMMONS ARMY AIRFIELD
FT. BRAGG, N.C.**

SCALE IN FEET

