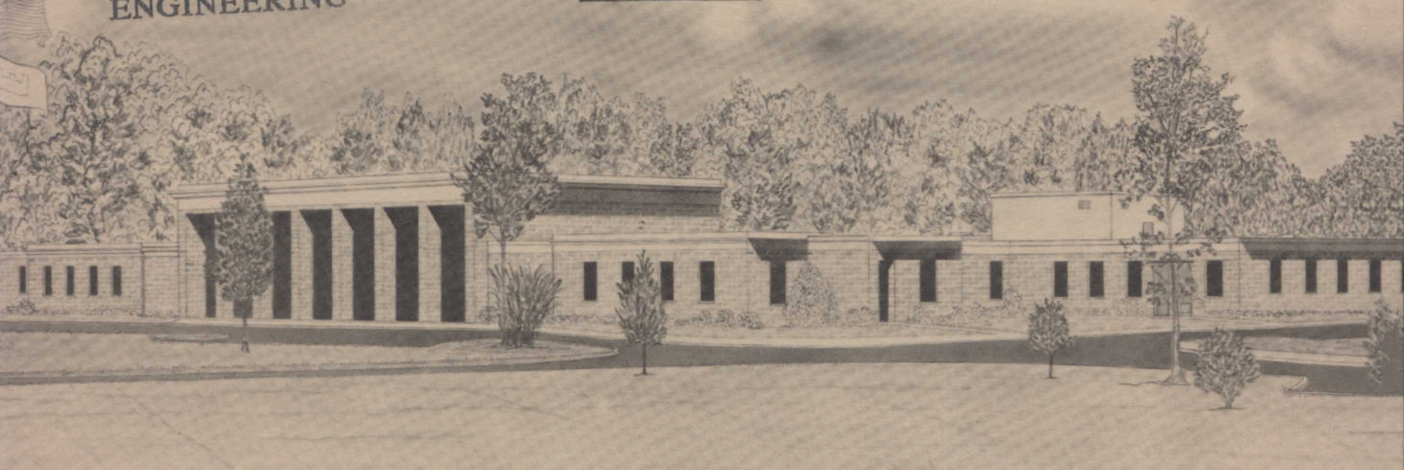
MISCELLANEOUS PAPER S-73-34

CONDITION SURVEY, PEASE AIR FORCE BASE, NEW HAMPSHIRE

by

R. D. Jackson



May 1973

Sponsored by Office, Chief of Engineers, U. S. Army

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

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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, P. S. McCaffrey, Jr., and W. J. McRay of the WES and Messrs. H. H. Baker and J. Razza of the U. S. Army Engineer Division, New England (NED), Waltham, Massachusetts. 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. That portion of the study pertaining to frost action was carried out by the U. S. Army Cold Regions Research and Engineering Laboratory (CRREL), Hanover, New Hampshire, with the assistance of the Foundations and Materials Branch, NED. The section of this report concerning frost action was prepared by Mr. Baker 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.

Contents

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	0.45359237	kilograms
pounds (force) per square inch	0.6894757	newtons per square centimeter

CONDITION SURVEY, PEASE AIR FORCE BASE, NEW HAMPSHIRE

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 Pease Air Force Base (PAFB), New Hampshire, during 14-18 August 1972. The inspection for effects of frost action was performed on 1 June 1972. The following three major areas of interest were considered in this condition survey:

- a. The structural condition of the primary airfield pavements.
- b. The condition of pavement repairs and the types of maintenance materials that have been used at this airfield.
- c. 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. PAFB is located in Rockingham County, New Hampshire,

approximately 2 miles* west of the city of Portsmouth, New Hampshire. A vicinity map is shown in plates 1 and 2.

5. In August 1972, the airfield facilities consisted of a NW-SE (16-34) runway, a parallel taxiway, parking aprons A and B, two warm-up aprons, taxiways connecting the runway to the parallel taxiway, a calibration hardstand, a taxiway through apron B, three maintenance access aprons, and two DC aprons. The NW-SE runway was 11,320 ft long and 300 ft wide; parking apron A was 8,745 ft long and 935 ft wide; parking apron B was 2,025 ft long and 925 ft wide; the parallel taxiway was 12,915 ft long and 75 ft wide; the two warm-up aprons were irregular in shape; the taxiways connecting the runway to the parallel taxiway were 900 ft long and 75 ft wide; the calibration hardstand was 137.5 ft in diameter; the taxiway through apron B was 2,025 ft long and 75 ft wide; and the maintenance access and DC aprons were of various sizes. A layout of the airfield is shown in plate 1. A pavement plan indicating the type pavement on each facility is shown in plate 2.

Previous reports

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

7. Condition survey reports:

a. Ohio River Division Laboratories, CE, "Condition Survey Report, Pease Air Force Base, New Hampshire," February 1962, Cincinnati, Ohio.

b. __________, "Condition Survey Report, Pease Air Force Base, New Hampshire," January 1964, Cincinnati, Ohio.

c. U. S. Army Engineer Waterways Experiment Station, CE, "Pavement Condition Survey Report, Pease Air Force Base, Portsmouth, New Hampshire," April 1967, Vicksburg, Mississippi.

8. Pavement evaluation report: U. S. Army Engineer Division, New England, CE, "Airfield Evaluation Report, Pease Air Force Base, Portsmouth, New Hampshire," May 1959, Waltham, Massachusetts.

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

History of Airfield Pavements

Design and construction history

9. Details of the design and construction history of the airfield pavements are presented in table 1. Pavement thicknesses, descriptions, and other details are presented in table 2.

Traffic history

10. A detailed traffic record was not available; however, based on the incomplete records for the period April 1957-June 1970, it is reasonable to assume that the airfield has received at least the following number of cycles* per type of aircraft: B-47's, 38,114 cycles; B-52's, 1,860 cycles; KC-97's, 18,165 cycles; KC-135's, 5,569 cycles; heavy cargo aircraft, 3,787 cycles; and all other aircraft, 31,018 cycles. In addition to this traffic, a portion of the airfield has been subjected to a number of alert taxiing movements. These movements consisted of taxiing from parking apron A to the taxiway through this apron, along taxiway A to the end of the runway, and then returning to apron A by the same route. The number of alert operations conducted using this pattern were as follows: B-47's, 97 movements; KC-97's, 307 movements; B-52's, 219 movements; and KC-135's, 645 movements. Gross aircraft loadings for the taxiing movements were as follows: B-47's, 190,000 lb; KC-97's, 175,000 lb; B-52's, 455,000 lb; and KC-135's, 290,000 lb. Approximately 75 percent of the takeoffs are from the SE end of the runway.

Conditions of Pavement Surfaces

Pavement inspection procedure

11. 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

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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 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. 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.

Runway

12. The NW end of the runway (features R1A and R2B) was structurally in very good condition based on the percentage of slabs containing no major defects. A total of 26 major defects were noted in feature R1A, all of which were longitudinal cracks. Of the 26 defects, 12 were in the two outer lanes on each side, and the other 14 were about equally divided among the other 8 lanes. Feature R2B contained 46 major defects, 45 longitudinal cracks and 1 transverse crack. Twenty-eight of the defects were located in the two outer lanes on each side; the other 18 were about equally divided among the other eight lanes. The asphaltic concrete (AC) interior portion of the runway (feature R3C) between the 1000-ft portland cement concrete (PCC) ends was in only fair condition because of longitudinal cracking (photos 1 and 2) and slight rutting. (This feature should now be in good condition, since a 3/4-in. friction overlay has been applied.) The SE end of the runway (features R5A and R4B) was in a poor to failed condition based on the number of slabs containing major defects. These two features contained a total of 332 major defects, of which 209 were located in the two outer lanes on each side. Twenty-seven slabs are scheduled for replacement in these features. Photo 3 shows the condition of the PCC pavement at the junction of the AC pavement at the SE end of the runway. The general conditions of the PCC pavements in features R5A and R4B (SE end of the runway) are shown in photos 4 and 5.

Taxiways

13. Taxiways A, B, C, and D were in fair to good condition, even though there was some longitudinal cracking and slight rutting in the AC comprising them. The taxiway through parking apron A (feature T1A) was in fair condition based on the number of slabs containing major defects. This feature contained 521 major defects, of which 515 were longitudinal cracks. These longitudinal cracks appeared to be the result of channelized traffic, since 60 percent of them were in the center lane. The taxiway through parking apron B (feature T2A) was in poor condition. This feature contained 123 major defects, of which approximately 50 percent were in the center lane.

Aprons

14. The north warm-up apron (feature A1B) was in very good condition based on the percentage of slabs containing no major defects. Jet blast had caused scaling on approximately 10 percent of the slabs. Photo 6 shows some of the scaling in feature A1B. The south warm-up apron (feature A2B) was in fair condition. There were 110 major defects in this feature, of which 100 were longitudinal cracks. Most of the longitudinal cracks were of the type shown in photo 7. They appeared to be caused by the manner in which the pavement had been placed rather than by overloading. Scaling was also prevalent in this feature, with approximately 20 percent of the slabs containing this defect (photo 8). Parking aprons A and B (features A3B and A4B) were in very good condition based on the percentages of slabs containing no major defects. Approximately 10 percent of the slabs in these features contained longitudinal cracks, which were the predominant defect. A large percentage of these longitudinal cracks were of the type shown in photo 9, and they did not appear to be load related. Considerable expansion of these aprons has resulted in upheaval of the shoulder pavements (photo 10) and the removal of the PCC pavement around embedded features, such as the fueling hydrants and drainage structures (photo 11).

15. Those pavement features not specifically mentioned above were in very good to excellent structural condition.

Frost Action

Objectives of inspection

16. The airfield pavements at PAFB were inspected for evidence of detrimental frost effects on 1 June 1972 by a team from the New England Division. One member of this team also participated in the WES condition survey of 14-18 August 1972. The objectives of the frost effects inspections were to determine:

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

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

Frost heave

17. The airfield pavements were examined for surface irregularities indicative of differential frost heaving. Both of the frost action inspections were conducted long after the spring thaw at times when the effects of nonuniform frost heave would not be apparent except in severe cases. Inquiries were made of the base personnel regarding the development of undesirable surface roughness during the winter months.

18. The rigid pavement ends of the runway were free of detectable roughness of the type associated with frost heaving. The flexible pavement runway interior, which was smooth longitudinally, was noticeably uneven transversely as a result of shallow rutting. Except for certain of the shoulder pavements, the remaining airfield pavement features were found to be smooth. Base personnel reported that frost heaving had occurred in the west shoulder of taxiway D near sta 150+00. Although the heave had subsided completely by the time of the inspections, a crack pattern consistent with frost heaving was evident. It is significant that the area where the heave occurred was the only one in which groundwater was located within 5 ft of the pavement surface. The upheaval of the apron shoulders discussed in paragraph 14 was not considered to be frost related.

Freezing indices

19. A freezing index of 1000 degree-days was used for the design

of the airfield pavements. The basis for this index is not known, but it was probably based on the coldest winter of the preceding 10 years as indicated by temperature data from the Portsmouth, New Hampshire, Weather Station. On the basis of temperature records up to and including the 1971-72 season, a design freezing index of 1114 degree-days is representative of the coldest season in the past ten. Seasonal freezing indices since the 1957-58 winter are tabulated below:

Freezing Season	Freezing Index degree-days	Freezing Season	Freezing Index degree-days
1958-59	958	1965-66	583
1959-60	418	1966-67	826
1960-61	996	1967-68	973
1961-62	782	1968-69	664
1962-63	877	1969-70	791
1963-64	888	1970-71	1003
1964-65	816	1971-72	569

These tabulated indices were determined solely on the basis of average monthly temperatures. Indices thus determined are generally somewhat lower than those computed with consideration given to average daily temperatures for the transition months at both ends of the freezing season. For example, the index for 1970-71, which was determined on the basis of average monthly temperatures, is 1003 degree-days, whereas the design index computation, which was determined with consideration to the transition months, is 1114 degree-days. The tabulated seasonal indices, however, do indicate the relative severity of winters during the 1958-72 period.

20. Since the airfield pavements at this base were constructed, the experienced freezing index has been near design magnitude (above ±900 degree-days) on four occasions. In view of this fact, the general absence of evidence of differential frost heaving is significant. For the design index, a combined pavement and base thickness of about 65 in. would be required for the prevention of subgrade freezing, and combined thicknesses of 45 to 48 in. would be needed to meet current criteria for limited subgrade frost penetration design. Since all of the primary pavements at this base meet the latter criteria, actual subgrade frost

penetrations of from 8 to 12 in. are presumed to have occurred during the colder winters. In view of the low frost susceptibility of the subgrade soils and the fact that groundwater levels generally occur more than 20 ft below the pavement surfaces, little or no frost heaving would be expected. The results of this survey bear this conclusion out. The only known instance of frost heaving at PAFB has occurred in a nontraffic feature (with only a 12-in. combined pavement thickness) in the only area of shallow groundwater depth. It is significant that the adjacent taxiway pavement (with 48-in. combined pavement thickness) showed no signs of differential frost heaving.

Thaw weakening

21. The extent of thaw weakening of the subgrade and base courses could not be readily determined by inspection of the pavements. Pavement failures usually are repaired soon after they occur and usually are not easily examined during a condition survey. However, even where examination is possible, it is often impossible to establish by visual observations whether a failure is the result of thaw weakening or of deficiencies in the thickness of the pavement components with respect to the "normal" period loadings. The depletion of the fatigue resistance of a pavement system is progressive under repeated loadings and, in frost areas, is related to thaw weakening in that the rate of depletion is greater during and directly following the frost-melting period. This rate of pavement weakening holds true whether the evidence of fatigue or failure becomes apparent during the melting period or at some other time. The degree of thaw weakening and its effects, if any, on the condition of the pavements at PAFB consequently could not be appraised solely by this inspection. Some limited perception of the severity of thaw weakening effects can be gained, however, by comparing the performance of certain pavement features with what might be expected in the light of current frost design criteria.

22. The primary flexible pavement features at this base are the runway interior (feature R3C), taxiway A (feature T3A), and taxiway D (feature T6A). All of these features have a combined pavement thickness of 48 in., which is adequate in accordance with the current

criteria for limited subgrade frost penetration design, and no reduction in the evaluations for frost condition operation is warranted (table 4). The runway interior pavement, however, is deficient by 3 in. in the thickness of the crushed-stone base course relative to current normal (nonfrost) heavy-load design criteria (265,000-lb gear loads). Similarly, the two taxiways are deficient by 1 in. in pavement thickness and by 4 in. in crushed-stone base course thickness. All of these pavements show some load-induced defects, principally shallow rutting and longitudinal cracking, as shown in photos 1 and 2. Rigid pavement slab thicknesses of primary pavements are also from 3 to 4 in. less than those required by current normal (nonfrost) heavy-load design criteria, and load-induced defects were noted in all of these features to degrees roughly proportional to exposure to traffic channelization (photo 5).

23. PAFB was designed for medium-load aircraft (100,000-lb gear loads), and the principal aircraft using the airfield (B-47's and KC-97's) have not overloaded the pavements. B-52 aircraft (which have applied approximately 2000 cycles of traffic and alert taxiing movements, paragraph 10), however, have significantly overloaded the traffic area A and B pavements (see plate 1). The performance of these pavements is consistent with what might be expected considering the design and traffic, and it does not appear that frost weakening has been a significant factor in the development of the defects observed.

Maintenance

24. Maintenance of the airfield pavements at PAFB generally has consisted of seal coating the AC pavements and sealing joints and patching spalls in the PCC pavements. However, continued movement of the PCC pavements of the aprons due to horizontal expansion has caused an increase in the cost of maintenance. This type of movement necessitates the removal of the PCC pavements around an embedded feature and replacement with a flexible material such as the AC shown in photo 11. As an experiment, polyurethane foam has been recently used as a fill material between embedded features and the PCC pavements. A tabulation

of the costs of contract maintenance of the airfield pavements is presented below for the period 1961-72.

Year	Amount	Year	Amount
1961	$58,726	1966	$ 13,363
1962	47,585	1968	16,800
1963	29,531	1969	81,902
1964	16,724	1971	32,524
1965	96,006	1972	360,000*

* Friction overlay.

The above amounts do not account for some maintenance that has been performed by base personnel.

Evaluation

25. 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

26. The following statements summarize the findings of this inspection:

a. Considerable longitudinal cracking in the PCC pavements of the runway and aprons was noted; however, this cracking did not appear to be load related.

b. The AC pavement of the runway interior was in only fair condition at the time of the survey because of cracking and rutting. Since the survey, a friction-type, 3/4-in. AC overlay has been applied to this feature that should upgrade its general condition to good.

c. The taxiways through parking aprons A and B contained numerous structural defects that appeared to have been caused by channelized traffic.

d. Expansion of the PCC pavements of the aprons had caused upheaval of the shoulder pavements and displacement of drainage structures and fueling facilities. The PCC pavement around some of these facilities had been removed and replaced with AC pavement.

e. Around some of the drainage structures, polyurethane foam was used to replace the PCC pavement.

f. Spall repair has generally been accomplished by removing the damaged pavements and replacing them with new PCC.

g. Evidence of detrimental effects of frost action was observed in only one area, the shoulder of taxiway D. (The water table in this area was within 5 ft of the pavement surface.)

Table 1

Airfield Design and Construction History

Pavement Facility	Dimensions: Length ft	Dimensions: Width ft	Pavement: Thickness in.	Pavement: Type	Construction: Year(s)	Construction: Agency	Design Criteria: Weight lb	Design Criteria: Gear Configuration
NW-SE runway interior	9300	300	4	AC	1954-56	CE*	100,000	Twin wheels spaced 37.5 in. c-c with 267-sq-in. tire contact area (tricycle)
Taxiway A	1570	75	4	AC	1954-56	CE	↓	↓
Taxiway B	900	75	4	AC	1954-56	CE	↓	↓
Taxiway C	900	75	4	AC	1954-56	CE	↓	↓
Taxiway D	2600	75	4	AC	1954-56	CE	↓	↓
NW-SE runway ends	1000	300	14	PCC	1954-56	CE	↓	↓
North warm-up apron	Varies	Varies	14	PCC	1954-56	CE	↓	↓
South warm-up apron	Varies	Varies	14	PCC	1954-56	CE	↓	↓
Parking apron A	8745±	935	14	PCC	1954-56	CE	↓	↓
Parallel taxiway through parking apron A	8745	75	14	PCC	1954-56	CE	↓	↓
Calibration hardstand and taxiway	Varies	Varies	14	PCC	1954-56	CE	↓	↓
Maintenance access apron 2	Varies	Varies	13	PCC	1954-56	CE	80,000	Twin wheels (tricycle)
Maintenance access apron 3	260	170	13	PCC	1954-56	CE	160,000	Twin-twin wheels (tricycle)
Maintenance access apron 5	Varies	Varies	13	PCC	1954-56	CE	80,000	Twin wheels (tricycle)
DC aprons (2)	Varies	Varies	13	PCC	1956	CE	100,000	Twin wheels
Parking apron B	2025±	925	13	PCC	1956	CE	100,000	Twin wheels
Taxiway through parking apron B	2025±	75	13-15-13	PCC	1956	CE	100,000	Twin wheels

* CE denotes Corps of Engineers.

Table 2

SUMMARY OF PHYSICAL PROPERTY DATA

FACILITY Pease AFB, Portsmouth, N. H. — FACILITY NUMBER AND IDENTIFICATION		LENGTH FT	WIDTH FT	OVERLAY PAVEMENT THICK. IN.	OVERLAY PAVEMENT DESCRIPTION	OVERLAY PAVEMENT FLEX. STR PSI	PAVEMENT THICK. IN.	PAVEMENT DESCRIPTION	PAVEMENT FLEX. STR PSI	BASE THICK. IN.	BASE CLASSIFICATION	BASE CBR OR K	SUBGRADE CLASSIFICATION	SUBGRADE CBR OR K	GENERAL CONDITION OF AREA CONSIDERED
R1A	NW-SE runway, NW end; sta 150+00 to 155+00	500	300				14	Portland cement concrete	675	8 26	Sand (SW-SM) NFS Sand (SP-SM) NFS subbase	425	Sand (SP) F2		Very good
R2B	NW-SE runway, NW end; sta 145+00 to 150+00	500	300				14	Portland cement concrete	675	8 26	Sand (SW-SM) NFS Sand (SP-SM) NFS	425	Sand (SP) F2		Very good
R3C	NW-SE runway interior	9300	300				4	Asphaltic concrete		6 8 30	Crushed stone (GP) NFS Gravelly sand (SW-SM) NFS Gravelly sand (SW-SM) NFS	90 50 30	Silty sand (SM) F2 Sand (SP) F2 Sand (SP) F2	Compacted 15 Natural 10	
R4B	NW-SE runway, SE end; sta 46+80 to 51+80	500	300				14	Portland cement concrete	675	8 26	Sand (SW-SM) NFS Sand (SP-SM) NFS	425	Sand (SP) F2		Poor
R5A	NW-SE runway, SE end; sta 41+80 to 46+80	500	300				14	Portland cement concrete	675	8 26	Sand (SW-SM) NFS Sand (SP-SM) NFS	425	Sand (SP) F2		Poor to failed
T1A	Parallel taxiway through parking apron A	8745	75				14	Portland cement concrete	650	8 26	Sand (SW-SM) NFS Sand (SP-SM) NFS	425	Sand (SP) F2		Fair
T2A	Taxiway through parking apron B	2025	75				15	Portland cement concrete (13 in.-15 in.- 13 in.)	600	8 25	Sand (SW-SM) NFS Sand (SP-SM) NFS	425	Sand (SP) F2		Poor
T3A T4C T5C T6A	Taxiway A (connecting) Taxiway B (cutoff) Taxiway C (cutoff) Taxiway D (connecting)	1570 900 900 2600	75 75 75 75				4	Asphaltic concrete		6 10 28	Crushed stone (GP-GM) NFS Sand (SW-SM) NFS Sand (SP-SM) NFS	90 50 30	Sand (SM) F2	15	
A1B	North warm-up apron	Irregular	Irregular				14	Portland cement concrete	650	8 26	Sand (SW-SM) NFS Sand (SP-SM) NFS	425	Sand (SM) F2		Very good
A2B	South warm-up apron	Irregular	Irregular				14	Portland cement concrete	650	8 26	Sand (SW-SM) NFS Sand (SP-SM) NFS	425	Sand (SM) F2		Fair
A3B	Parking apron A	8745±	935				14	Portland cement concrete	650	8 26	Sand (SW-SM) NFS Sand (SP-SM) NFS	425	Sand (SM) F2		Very good
A4B	Parking apron B	2025±	925				13	Portland cement concrete	625	8 27	Sand (SW-SM) NFS Sand (SP-SM) NFS	425	Sand (SM) F2		Very good
A5B	Maintenance access apron 2	300	230				13	Portland cement concrete	625	8 27	Sand (SW-SM) NFS Sand (SP-SM) NFS	400	Sand (SM) F2		Excellent
A6B	Maintenance access apron 3	150	100				13	Portland cement concrete	625	8 27	Sand (SW-SM) NFS Sand (SP-SM) NFS	400	Sand (SM) F2		Excellent
A7B	DC hangar aprons	300 300	150 150				13	Portland cement concrete	625	8 27	Sand (SW-SM) NFS Sand (SP-SM) NFS	400	Sand (SM) F2		Very good
A8B	Maintenance access apron 5	300	230				13	Portland cement concrete	625	8 27	Sand (SW-SM) NFS Sand (SP-SM) NFS	400	Sand (SM) F2		Very good

Table 2 (Continued)

SUMMARY OF PHYSICAL PROPERTY DATA

FACILITY Pease AFB, Portsmouth, N. H.				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	
A9C	Calibration hardstand (137.5 ft diam) and taxiway	625	75				14	Portland cement concrete	675	8 26	Sand (SW-SM) NFS Sand (SP-SM) NFS	425	Sand (SM) F2		Excellent
R6X	NW-SE runway blast pads	150	300				2	Asphaltic concrete		6 4	Sand (SW-SM) NFS Sand (SP-SM) NFS	50 30	Sand (SM) F2	15	Good
R7X	NW-SE runway overruns ends	850	350					Double bituminous surface treatment		6	Graded crushed stone	80	Sand (SP-SM)	30	Fair

WES FORM 1000 MAR 1958

Table 3

DATE: August 1972

SUMMARY OF DATA - RIGID PAVEMENT CONDITION SURVEY

AIRFIELD: Pease AFB Portsmouth, N. H.

FEATURE NO.	FEATURE DESIGNATION	SLAB SIZE FT	APPROX NO. OF SLABS	PAVE. THICK. IN.	NO. OF SLABS CONTAINING INDICATED DEFECTS: I	—	\	Δ	✱	K	~	S	J	Ɉ	J	⊕	M*	P	O	C	D	% OF SLABS NO DEFECTS	% OF SLABS NO MAJOR DEFECTS	CONDITION
R1A	NW-SE runway NW end, 1st 500 ft	25 by 25	240	14	26						11								1			85.4	89.2	Very good
R2B	NW-SE runway NW end, 2nd 500 ft	25 by 25	240	14	45	1					2		3						1			78.3	80.8	Very good
R4B	NW-SE runway SE end, 2nd 500 ft	25 by 25	240	14	144				7		25	2	10	3	3				6	1		50.4	59.2	Poor
R5A	NW-SE runway SE end, 1st 500 ft	25 by 25	240	14	170	2		3	6		35	1	12		4				10	2		19.2	32.5	Poor to failed
T1A	Taxiway through parking apron A	25 by 25	1,057	14	515	1		5			190		42	8	9				7			52.0	65.5	Fair
T2A	Taxiway through parking apron B	25 by 25	284	13-15-13	121	1	1				114		1	1	2				1			37.0	57.7	Poor
A1B	N warm-up apron	25 by 25	250	14	38	9	6		1		82	25	5	6	2				8			56.0	85.3	Very good
A2B	S warm-up apron	25 by 25	250	14	100	9	1				98	55	7	1	4				9	1		35.6	68.4	Fair
A3B	Parking apron A	25 by 25	12,025	14	1,633	30	15	8	5		751	36	188	27	65				26	7		80.9	89.4	Very good
A4B	Parking apron B	25 by 25	3,286	13	474	41	16	3			451	40	40	6	13				5	1		76.8	88.2	Very good

REMARKS: * Practically all slabs contained map cracking to some degree.

LEGEND:

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

WES FORM NO. 2004
JUN 1972

(1 of 2 sheets)

Table 3 (Continued)

DATE: August 1972

SUMMARY OF DATA - RIGID PAVEMENT CONDITION SURVEY

AIRFIELD: Pease AFB Portsmouth, N. H.

FEATURE NO.	FEATURE DESIGNATION	SLAB SIZE FT	APPROX NO. OF SLABS	PAVE. THICK. IN.	I	—	\	Δ	✱	K	〰	S	J	⇃	J	⊕	M	P	O	C	D	% OF SLABS NO DEFECTS	% OF SLABS NO MAJOR DEFECTS	CONDITION
A5B	Maintenance access apron 2	25 by 25	521	13	2	1					1		8	2	5							96.4	99.4	Excellent
A6B	Maintenance access apron 3*	25 by 25	77	13																				Excellent
A7B	DC apron	25 by 25	627	13	74	5		3			24		5		8							83.6	88.3	Very good
A8B	Maintenance access apron 5*	25 by 25	353	13	44	2	4				11		5		1					3		82.2	87.0	Very good
A9C	Calibration hardstand and taxiway	25 by 25	120	14																				Excellent

REMARKS: * Not surveyed in detail.

LEGEND:

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

WES FORM NO. 2004
JUN 1972

(2 of 2 sheets)

Table 4

SUMMARY OF PAVEMENT EVALUATION

NAME OF AIRFIELD: Pease AFB

DATE OF EVALUATION MONTH: August 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 — TRICYCLE ARRANGEMENT: SINGLE 100-PSI TIRE PRESSURE (1)	SINGLE 100-SQ-IN. CONTACT AREA (2)	SINGLE 241-SQ-IN. CONTACT AREA (3)	TW 28-IN. C-C 226-SQ-IN. CONTACT AREA EACH TIRE (4)	SINGLE TANDEM 60-IN. SPACING 400-SQ-IN. CONTACT AREA (5)	TW 37-IN. C-C 267-SQ-IN. CONTACT AREA EACH TIRE (6)	TW 44-IN. C-C 630-SQ-IN. CONTACT AREA EACH TIRE (7)	TWIN TANDEM 33 IN. x 48 IN. 208-SQ-IN. CONTACT AREA EACH TIRE (8)	C-5A GEAR CONFIGURATION (9)	BICYCLE: TWIN TWIN SPCG 37-62-37 267-SQ-IN. CONTACT AREA EACH TIRE (10)	REMARKS
R1A R5A	NW-SE runway 1st 500 ft NW end 1st 500 ft SE end	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	240,000	330,000	380,000+	800,000+	380,000	
R2B R4B	NW-SE runway 2nd 500 ft NW-end 2nd 500 ft SE end	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	380,000+	800,000+	410,000	
R3C	NW-SE runway interior	Capacity	155,000+	85,000+	155,000+	215,000	200,000+	330,000	330,000+	380,000+	800,000+	540,000	
T1A	Taxiway through parking apron A	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	230,000	320,000	380,000+	800,000+	370,000	
T2A	Taxiway through parking apron B	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	235,000	320,000	380,000+	800,000+	370,000	
T3A T6A	Taxiway A (connecting) Taxiway D (connecting)	Capacity	155,000+	60,000	130,000	160,000	200,000+	225,000	275,000	320,000	800,000+	380,000	
T4C T5C	Taxiway B (cutoff) Taxiway C (cutoff)	Capacity	155,000+	85,000+	155,000+	215,000	200,000+	330,000	330,000+	380,000+	800,000+	540,000	
A1B A2B A3B	North and south warm-up aprons Parking apron A	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	275,000	330,000+	380,000+	800,000+	390,000	
A4B	Parking apron B	Capacity	140,000	85,000+	155,000+	210,000	200,000+	240,000	320,000	380,000+	800,000+	340,000	

Note: + sign denotes allowable gross loading greater than maximum gross weight of any existing aircraft having indicated gear configuration. Frost evaluations are not shown, since combined pavement thicknesses are adequate for limited subgrade frost penetration criteria.

Table 4 (Continued)

SUMMARY OF PAVEMENT EVALUATION

NAME OF AIRFIELD: Pease AFB

DATE OF EVALUATION MONTH: August YR: 1972

LOAD-CARRYING CAPACITY IN LB OF GROSS PLANE LOAD FOR INDICATED LANDING GEAR TYPES AND CONFIGURATIONS

FEATURE NO.	FEATURE DESIGNATION	PAVEMENT OPERATIONAL USE	TRICYCLE ARRANGEMENT: SINGLE 100-PSI TIRE PRESSURE (1)	SINGLE 100-SQ-IN. CONTACT AREA (2)	SINGLE 241-SQ-IN. CONTACT AREA (3)	TW 28-IN. C-C 226-SQ-IN. CONTACT AREA EACH TIRE (4)	SINGLE TANDEM 60-IN. SPACING 400-SQ-IN. CONTACT AREA (5)	TW 37-IN. C-C 267-SQ-IN. CONTACT AREA EACH TIRE (6)	TW 44-IN. C-C 530-SQ-IN. CONTACT AREA EACH TIRE (7)	TWIN TANDEM 33 IN. × 48 IN. 208-SQ-IN. CONTACT AREA EACH TIRE (8)	C-5A GEAR CONFIGURATION (9)	BICYCLE: TWIN TWIN SPCG 37-62-37 267-SQ-IN. CONTACT AREA EACH TIRE (10)	REMARKS
A5B A6B A7B A8B	Maintenance access apron 2 Maintenance access apron 3 DC hangar aprons Maintenance access apron 5	Capacity	135,000	85,000+	155,000+	200,000	200,000+	225,000	310,000	380,000+	800,000+	320,000	
A9C	Calibration hardstand and taxiway	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	380,000+	800,000+	550,000	

WES FORM NO. 999 JUNE 1972 EDITION OF AUG 1960 IS OBSOLETE.

(2 of 2 sheets)

Photo 1. General view of cracking on runway approximately 2500 ft from NW end

Photo 2. General view of runway near SE end of AC pavement

Photo 3. Pavement condition at junction of PCC and AC at SE end of runway

Photo 4. AC surface patches on PCC pavement at SE end of runway

Photo 5. General view of PCC pavement at SE end of runway

Photo 6. Scaling of slabs in north warm-up apron

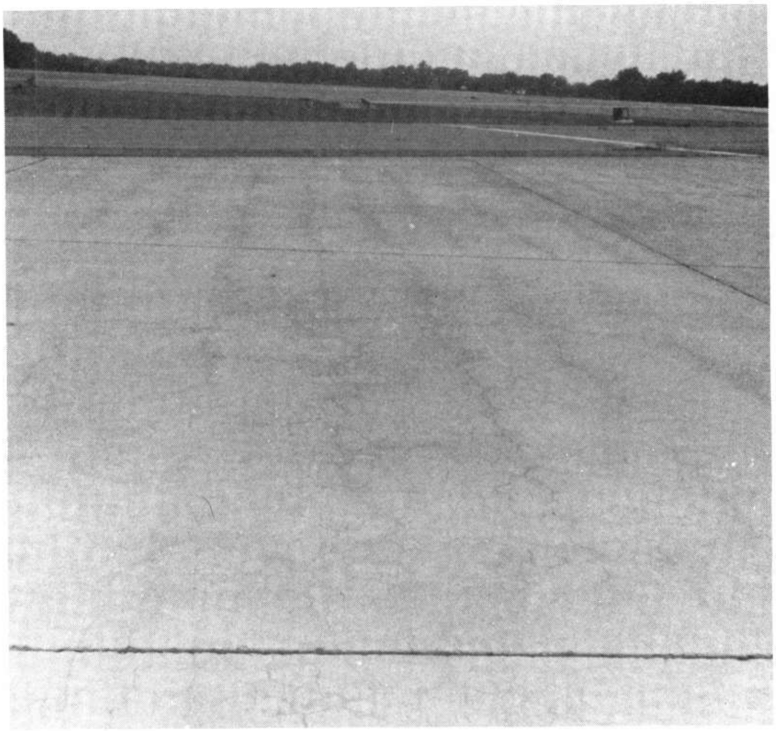

Photo 7. Longitudinal cracks in south warm-up apron

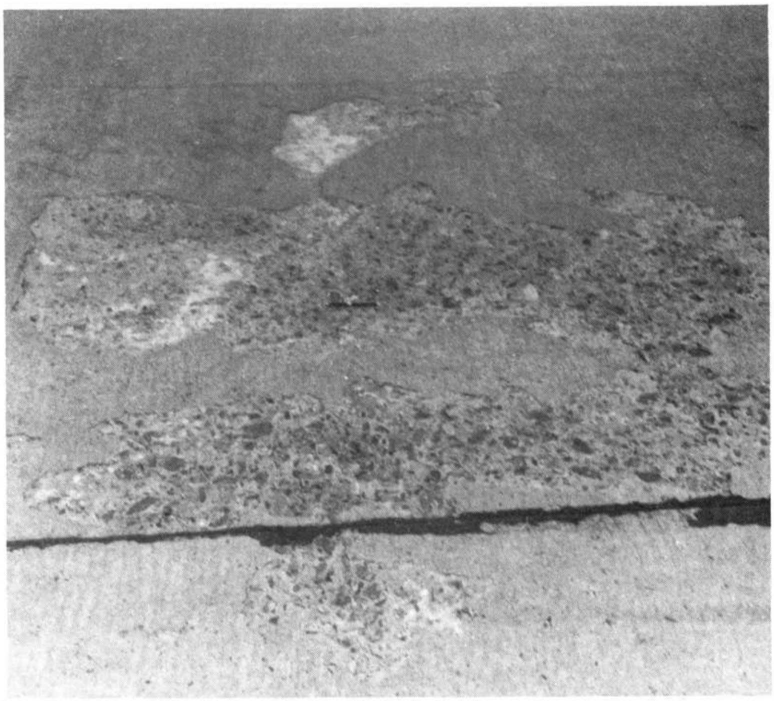

Photo 8. Scaling of slabs in south warm-up apron

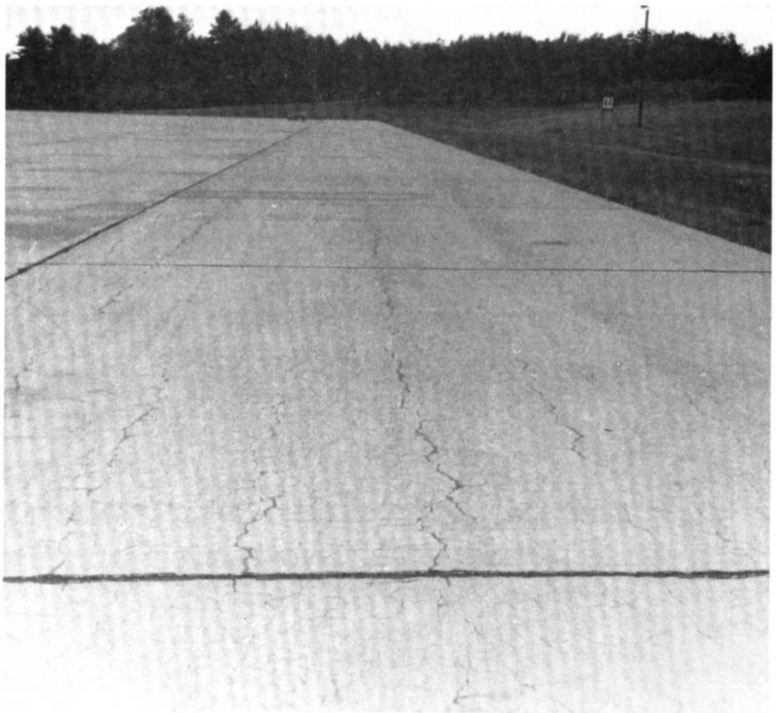

Photo 9. Typical longitudinal cracking
(as in parking aprons A and B)

Photo 10. Upheaval of shoulder pavement at
north end of parking apron A

Photo 11. AC replacement of PCC pavement at drainage structure

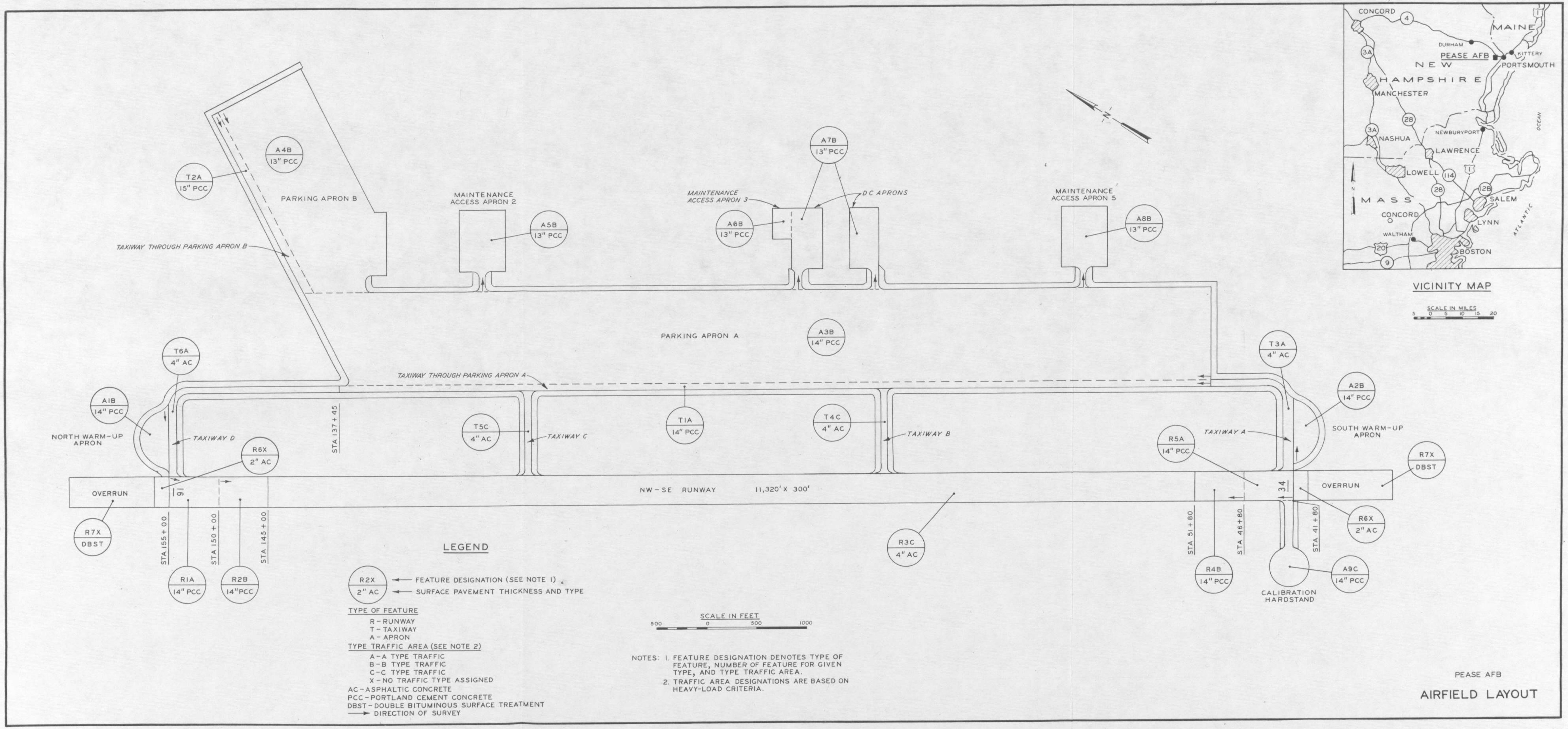
CONCORD
MAINE
DURHAM
PEASE AFB
KITTERY
PORTSMOUTH
NEW HAMPSHIRE
MANCHESTER
NASHUA
NEWBURYPORT
OCEAN
LAWRENCE
LOWELL
MASS
SALEM
CONCORD
LYNN
ATLANTIC
WALTHAM
BOSTON
VICINITY MAP
SCALE IN MILES
5 0 5 10 15 20
T2A 15" PCC
A4B 13" PCC
PARKING APRON B
MAINTENANCE ACCESS APRON 2
A5B 13" PCC
MAINTENANCE ACCESS APRON 3
A6B 13" PCC
A7B 13" PCC
D C APRONS
MAINTENANCE ACCESS APRON 5
A8B 13" PCC
TAXIWAY THROUGH PARKING APRON B
PARKING APRON A
A3B 14" PCC
T6A 4" AC
A1B 14" PCC
TAXIWAY THROUGH PARKING APRON A
T3A 4" AC
A2B 14" PCC
NORTH WARM-UP APRON
TAXIWAY D
R6X 2" AC
STA 137 + 45
T5C 4" AC
TAXIWAY C
T1A 14" PCC
T4C 4" AC
TAXIWAY B
R5A 14" PCC
TAXIWAY A
SOUTH WARM-UP APRON
R7X DBST
OVERRUN
16
NW - SE RUNWAY 11,320' X 300'
34
OVERRUN
R7X DBST
STA 155 + 00
STA 150 + 00
STA 145 + 00
R1A 14" PCC
R2B 14" PCC
R3C 4" AC
STA 51 + 80
STA 46 + 80
STA 41 + 80
R6X 2" AC
R4B 14" PCC
A9C 14" PCC
CALIBRATION HARDSTAND
LEGEND
R2X ← FEATURE DESIGNATION (SEE NOTE 1)
2" AC ← 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
SCALE IN FEET
500 0 500 1000
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.
PEASE AFB
AIRFIELD LAYOUT

PLATE 1

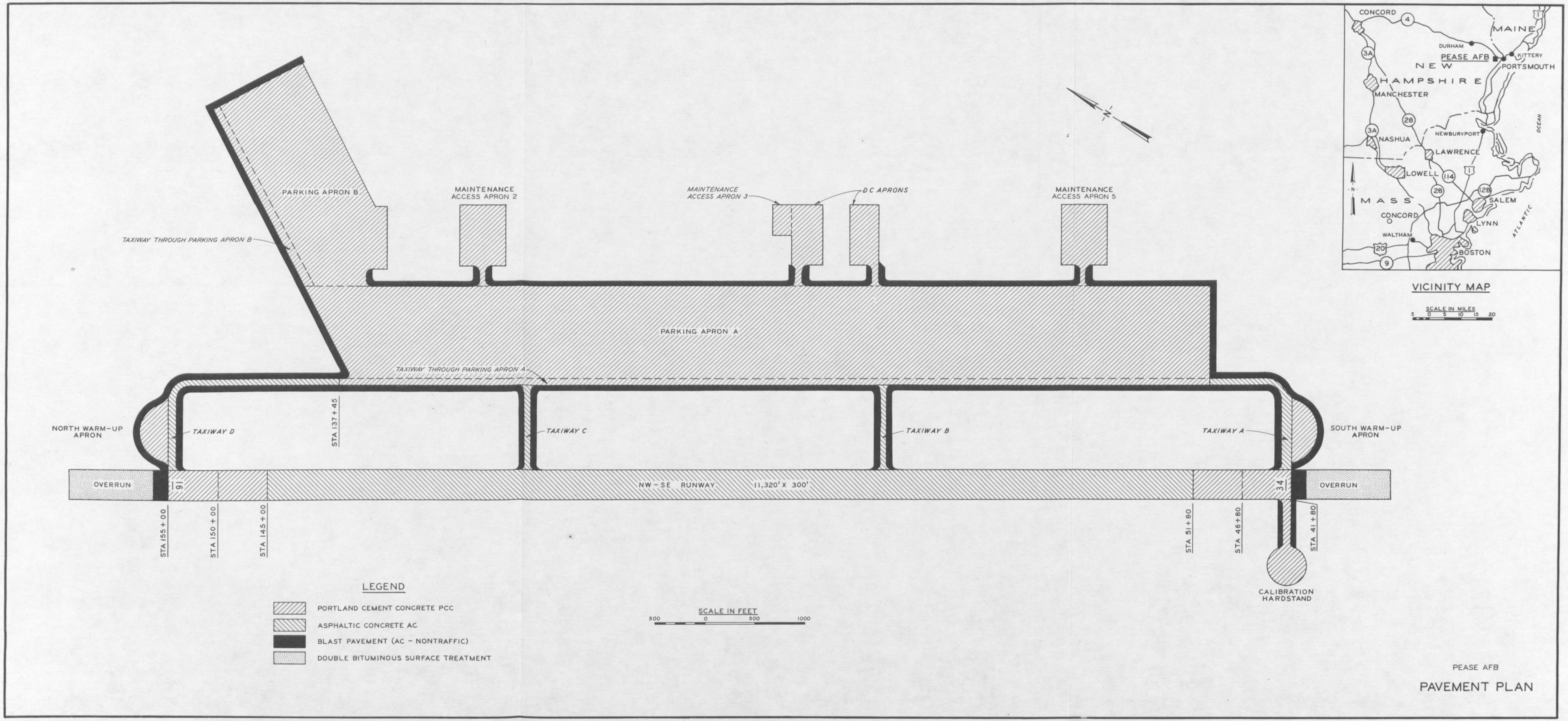
PARKING APRON B
TAXIWAY THROUGH PARKING APRON B
MAINTENANCE ACCESS APRON 2
MAINTENANCE ACCESS APRON 3
D C APRONS
MAINTENANCE ACCESS APRON 5
PARKING APRON A
TAXIWAY THROUGH PARKING APRON A
NORTH WARM-UP APRON
TAXIWAY D
STA 137 + 45
TAXIWAY C
TAXIWAY B
TAXIWAY A
SOUTH WARM-UP APRON
OVERRUN
16
NW – SE RUNWAY 11,320' X 300'
34
OVERRUN
STA 155 + 00
STA 150 + 00
STA 145 + 00
STA 51 + 80
STA 46 + 80
STA 41 + 80
CALIBRATION HARDSTAND
N
LEGEND
PORTLAND CEMENT CONCRETE PCC
ASPHALTIC CONCRETE AC
BLAST PAVEMENT (AC – NONTRAFFIC)
DOUBLE BITUMINOUS SURFACE TREATMENT
SCALE IN FEET
500 0 500 1000
CONCORD
MAINE
DURHAM
KITTERY
PEASE AFB
PORTSMOUTH
NEW HAMPSHIRE
MANCHESTER
NASHUA
NEWBURYPORT
OCEAN
LAWRENCE
LOWELL
MASS
CONCORD
SALEM
LYNN
ATLANTIC
WALTHAM
BOSTON
VICINITY MAP
SCALE IN MILES
5 0 5 10 15 20
PEASE AFB
PAVEMENT PLAN

PLATE 2