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PART XVI

AIRCRAFT GROUND-FLOTATION INVESTIGATION

PART XVI — DATA REPORT ON TEST SECTION 15

J. WATKINS and W. HILL, JR.

U. S. ARMY ENGINEER WATERWAYS EXPERIMENT STATION

TECHNICAL REPORT AFFDL-66-43, PART XVI

SEPTEMBER 1966

AIR FORCE FLIGHT DYNAMICS LABORATORY
RESEARCH AND TECHNOLOGY DIVISION
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

AIRCRAFT GROUND-FLOTATION INVESTIGATION

PART XVI — DATA REPORT ON TEST SECTION 15

J. WATKINS and W. HILL, JR.

FOREWORD

The investigation described herein constitutes one phase of studies conducted during 1964 and 1965 at the U. S. Army Engineer Waterways Experiment Station (WES) under U. S. Air Force Project No. 410-A, MIPR No. AS-4-177, "Development of Landing Gear Design Criteria for the CX-HLS Aircraft." (The CX-HLS is now designated C-5A.) This program was sponsored and directed by the Landing Gear Group, Air Force Flight Dynamics Laboratory, Research and Technology Division, Mr. R. J. Parker, Project Engineer.

These tests were conducted by personnel of the WES Flexible Pavement Branch, Soils Division, under the general supervision of Messrs. W. J. Turnbull, A. A. Maxwell, and R. G. Ahlvin, and the direct supervision of Mr. D. N. Brown. Other personnel actively engaged in this study were Messrs. C. D. Burns, D. M. Ladd, J. E. Watkins, H. H. Ulery, Jr., and W. J. Hill, Jr. This report was prepared by Messrs. Watkins and Hill.

Directors of WES during the conduct of this investigation and preparation of this report were Col. Alex G. Sutton, Jr., CE, and Col. John R. Oswalt, Jr., CE. Technical Director was Mr. J. B. Tiffany.

Publication of this technical documentary report does not constitute Air Force approval of the report's findings or conclusions. It is published only for the exchange and stimulation of ideas.

[illegible]ERLY H. DIGGES
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ABSTRACT

This data report describes work undertaken as part of an overall program to develop ground-flotation criteria for the C-5A aircraft. A test section was constructed to a width adequate for two similar test lanes. The test lanes were unsurfaced and each lane was divided into three items having different subgrade CBR values. Traffic was applied to both lanes using a 252,000-lb load (21,000 lb per wheel) on a 12-wheel (four abreast, three rows) tracking assembly. On the wheels were 20x20, 22-ply aircraft tires inflated to 55 psi. Wheel spacing for both lanes was 34-44-34 in. c-c abreast and 123 in. in tandem.

The information reported herein includes layout of the test lanes, characteristics and print dimensions of the load assembly tires, and data collected on soil strengths, surface deformations and deflections, and drawbar pull. The traffic-coverage level is given at which each test item was considered failed.

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ILLUSTRATIONS AND TABLES

SUMMARY

Tests on Section 15 are one phase of a comprehensive research program to develop ground-flotation criteria for heavy cargo-type aircraft. Section 15 consisted of two similar unsurfaced traffic lanes, lanes 33 and 34, each of which was divided into three items (figure 12) having different subgrade CBR values.

Traffic was applied to both lanes using a 252,000-lb load (21,000 lb per wheel) on a 12-wheel (four abreast, three rows) tracking assembly. On the wheels were 20x20, 22-ply aircraft tires inflated to 55 psi. Figure 13 gives tire-print dimensions and pertinent tire characteristics.

The lanes were trafficked to failure in accordance with the criteria designated in Part I of this report. Data were recorded throughout testing to give a behavior history of each item. Basic performance data are summarized in the following paragraphs.

Lane 33

Item 1

The item was considered failed due to rutting after 1 pass of the load vehicle. The rated CBR was 2.3.

Item 2

The item was considered failed due to excessive transverse and differential deformation after 25 coverages of the load vehicle. The rated CBR was 4.4.

Item 3

The item was considered failed due to excessive transverse and differential deformations after 59 coverages of the load vehicle. The rated CBR was 8.1.

Traffic results for item 3 are considered unreliable due to an unexplained variation in tire inflation pressure.

Lane 34

Item 1

The item was considered failed due to rutting after 1 pass of the load vehicle. The rated CBR was 2.5.

Item 2

The item was considered failed due to excessive differential deformation after 49 coverages of the load vehicle. The rated CBR was 4.7.

Item 3

The item was considered failed due to excessive differential deformations after 400 coverages of the load vehicle. The rated CBR was 7.0.

AIRCRAFT GROUND-FLOTATION INVESTIGATION

PART XVI DATA REPORT ON TEST SECTION 15

SECTION I: INTRODUCTION

The investigation reported herein is one phase of a comprehensive research program being conducted at the U. S. Army Engineer Waterways Experiment Station (WES), Vicksburg, Miss., as part of U. S. Air Force Project 410-A, MIPR No. AS-4-177, to develop ground-flotation criteria for the C-5A, a heavy cargo-type aircraft. Specifically, the tests reported herein were conducted to determine the degree of interaction of the wheels of multiple-wheel landing-gear assemblies on unsurfaced soils.

Prosecution of this investigation consisted of constructing two similar unsurfaced traffic lanes, lanes 33 and 34, and subjecting them to traffic of a 252,000-lb load on a 12-wheel (four abreast, three rows) tracking assembly, with each wheel equipped with a 20x20 aircraft tire inflated to 55 psi. After completion of tests on lane 33, it was evident that some error had been made in the conduct of that portion of the test performed on item 3 (failed at 59 coverages), since it was anticipated, on the basis of previous testing, that the item would sustain approximately 400 to 600 coverages of the test traffic prior to failure. After reviewing the test procedure and rechecking the CBR test values, it was discovered that the inflation pressure of the 12 tires on the test cart was not 55 psi as planned, but instead varied from 55 to 90 psi. No reasonable explanation as to how or why the inflation pressure was changed has been determined; therefore, the test data obtained from item 3 of traffic lane 33 will be ignored in analysis of the test data.

This report presents a description of the test section and wheel assemblies, and gives results of traffic. Equipment used, types of data and method of recording them, and general test criteria are summarized herein with more complete explanations and illustrations appearing in Part I of this report.

SECTION II: DESCRIPTION OF TEST SECTION AND LOAD VEHICLE

Description of Test Section

Test Section 15 (figure 12) was constructed within a roofed area in order to allow control of the subgrade CBR (California Bearing Ratio) in the test items. Section 15 was located on the same site as prior Test Sections 3, 5, and 13 in this series, the construction of which is described in Part IV of this report. The underlying subgrade was undisturbed by prior tests on the site so that in construction of Test Section 15 only the upper 24 in. of soil was excavated. The excavated area was backfilled to original grade in four compacted lifts with a heavy clay soil (buckshot; classified as CH according to the Unified Soil Classification System, MIL-STD-619). The fill material used was a local clay having a plastic limit of 27, liquid limit of 58, and plasticity index of 31. Gradation and classification data for the subgrade material are given in Part I.

Two unsurfaced traffic lanes, each divided into three items, were constructed in the test section. Different subgrade strengths were obtained in the items (figure 12) by controlling the water contents and compaction effort.

Load Vehicle

The load vehicle used in trafficking Section 15 is shown in figure 2. Further details on the load cart construction and operating characteristics are given in Part I. For trafficking lanes 33 and 34, a 252,000-lb load was used on a 12-wheel tracking assembly consisting of 20x20, 22-ply aircraft tires. Tire inflation pressure was 55 psi for both lanes, except in that portion of the test conducted on item 3 of lane 33 where there was a tire inflation pressure discrepancy. Tire-print data and pertinent tire characteristics are given in figure 13 for both test lanes.

SECTION III: APPLICATION OF TRAFFIC, FAILURE CRITERIA, AND DATA COLLECTED

Application of Traffic

Traffic was applied to the test lanes in a nonuniform pattern with intensity of traffic being varied within each lane. Traffic so distributed within a traffic lane simulates as nearly as feasible the bell-shaped traffic distribution curve which results from the wander of aircraft from the lane center line. The coverage levels referred to in the tables and text herein are the total number of coverages applied to the 100 percent coverage zone. The corresponding number of coverages applied to the outer traffic zones is proportional to the percentage factor for the respective zones as shown in figure 1. Each pass of the multiwheel assembly was equivalent to 1.25 coverages on lane 33 and to 1.33 coverages on lane 34.

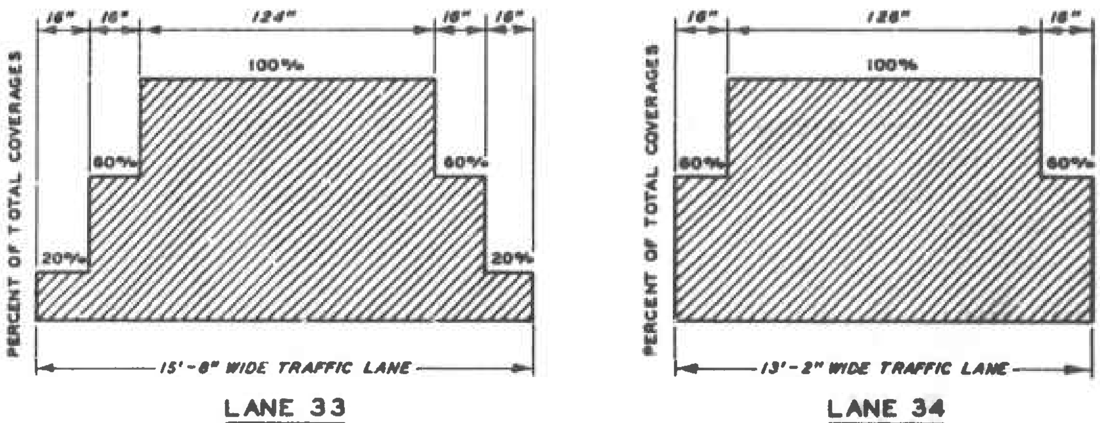


Figure 1. Traffic distribution patterns on Test Section 15

Failure Criteria and Data Collected

Failure criteria used in this investigation and descriptive terms used in presentation and discussion of data in all reports in this series are presented in Part I. A general outline of types of data collected is given in the following paragraphs. Details on apparatus and procedure for obtaining specific measurements are given in Part I.

CBR, water content, and dry density

CBR, water content, and dry density of the subgrade were measured for each test item prior to application of traffic, at intermediate coverage levels, and at failure. After traffic was concluded on an item, a measure of subgrade strength termed "rated CBR" was determined. Rated CBR is generally the average CBR value obtained from all the determinations made in the top 12 in. of soil during the test life of an item. In certain instances, extreme or irregular values may be ignored if the analyst decides that they are not properly representative.

Surface roughness, or differential deformation

Surface roughness, or differential deformation, measurements were made using a 10-ft straightedge at various traffic-coverage levels on all items. Rut depths were also measured.

Deformations

Deformations, defined as permanent cumulative surface changes in cross section or profile of an item, were charted by means of level readings at pertinent traffic-coverage levels.

Deflection

Deflection of the test surface under an individual static load of the tracking assembly was measured at various traffic-coverage levels. A pin and cap device directly beneath a load wheel provided deflection data. Both total (for a single loading) and elastic (recoverable) deflections were measured.

Rolling resistance

Rolling resistance, or drawbar pull, measurements were performed with the load vehicle over each test item at designated coverage levels. Two types of drawbar measurements were taken: (a) average force required to maintain a constant speed once the load vehicle is in motion, termed "rolling DBP"; and (b) maximum force obtained during the constant speed run, termed "peak DBP."

SECTION IV: BEHAVIOR OF ITEMS UNDER TRAFFIC AND TEST RESULTS

Lane 33

Behavior of items under traffic

Item 1. Item 1 prior to traffic is shown in figure 3. The item rutted severely at 1 pass of the load vehicle and was considered failed (figure 4). The rated CBR for the item was 2.3.

Item 2. Item 2 prior to traffic is shown in figure 5. At 25 coverages, the item was considered failed due to roughness (figure 6). The rated CBR for the item was 4.4.

Item 3. Item 3 prior to traffic is shown in figure 7. The surface held up well under traffic until 59 coverages when the item was considered failed due to excessive roughness (figure 8). The rated CBR for the item was 8.1. Data recorded on item 3 are considered unreliable due to an unexplained variation in tire inflation pressure.

Test results

Table 1 summarizes traffic data recorded on each item of lane 33 during testing. Soil test data are given in table 2.

Item 1. Item 1 was considered failed due to severe rutting after 1 pass of the load vehicle. The following information was obtained from traffic tests on item 1.

a. Roughness. No differential deformations were recorded on the item. Severe rutting occurred during the initial traffic pass with an average rut depth of 9.2 in. (table 1).

b. Deformation. Cross-sectional deformations are shown in figure 14 at two stations along the item. The severe ruts and ridges produced by 1 pass of the load vehicle are evident. The profile deformation plot for 1 pass shown in figure 16 indicates the increasingly severe settlement that occurred as the load vehicle progressed along the item.

c. Deflection. The elastic subgrade deflection for the single pass on the item was 0.10 in. (table 1).

d. Rolling resistance. Table 1 shows rolling and peak drawbar pulls of 38.1 and 48.8 kips, respectively, at 1 pass of the load vehicle.

Item 2. Item 2 was considered failed due to roughness at 25 coverages. The following information was obtained from traffic tests on item 2.

a. Roughness. At failure, transverse and diagonal differential deformations exceeded rut depths with average values of 5.19 and 5.47 in., respectively, versus an average rut depth of 2.66 in. (table 1).

b. Deformation. Figure 14 shows cross-section deformations at three stations along the item after 25 coverages. Ruts and ridges dominate the cross section with no tendency for uniform settlement evident. The center-line profile at 25 coverages (figure 16) along one of the rut paths illustrates the relatively smooth surface of the wheel tracks.

c. Deflection. Average total and elastic subgrade deflections at 1 pass and at 25 coverages are shown in table 1. Elastic deflection was unchanged with traffic and total deflection increased from 1.4 to 2.0 in.

d. Rolling resistance. Drawbar pull values increased significantly with traffic (table 1). Measurements at 1 pass and at 25 coverages gave peak drawbar pulls of 11.0 and 19.1 kips, respectively. Rolling drawbar pull increased from 8.4 to 12.3 kips over the same traffic interval.

Item 3. Item 3 was considered failed due to roughness at 59 coverages. The following information was obtained from traffic tests on item 3.

a. Roughness. Differential deformations and rut depths for 25 and 59 coverages are shown in table 1. Average transverse and diagonal differential deformations were 3.25 and 3.38 in. at failure, while the average rut depth was 2.00 in.

b. Deformation. Considerable increase in cross-section deformations between 25 and 59 coverages is evident at the five locations shown in figure 14. Toward the end of the item (sta 0+95 and sta 1+05), deformations were less severe.

c. Deflection. Total and elastic deflections shown for several coverage levels are erratic and show no apparent trend (table 1).

d. Rolling resistance. Drawbar pull increased irregularly with traffic (table 1). Peak drawbar pull increased overall with traffic from 8.7 to 9.3 kips and rolling drawbar pull increased from 6.6 to 8.0 kips.

Lane 34

Behavior of items under traffic

Item 1. Item 1 prior to traffic was similar in appearance to item 1, lane 33 (figure 3). The item rutted severely and was considered failed after 1 pass of the load vehicle (figure 9). The rated CBR for the item was 2.5.

Item 2. Item 2 prior to traffic was similar in appearance to item 2, lane 33 (figure 5). At 49 coverages, the item was considered failed due to roughness (figure 10). The rated CBR for the item was 4.7.

Item 3. Item 3 prior to traffic was similar in appearance to item 3, lane 33 (figure 7). The item settled somewhat under traffic, but roughness was slow in developing. At 400 coverages the item was considered failed due to excessive roughness (figure 11). The rated CBR for the item was 7.0.

Test results

Table 1 summarizes traffic data recorded on each item of lane 34 during testing. Soil test data are given in table 2.

Item 1. Item 1 was considered failed due to severe rutting after 1 pass of the load vehicle. The following information was obtained from traffic tests on item 1.

a. Roughness. No differential deformations were recorded on the item. The average rut depth after 1 pass was 9.7 in. (table 1).

b. Deformation. The severe ruts produced by 1 pass of the load vehicle are evident in the cross-section plots in figure 15. Figure 16 shows a profile along a rut path near the lane center line. The profile deformation increased steadily in the first 25 ft of the item and decreased thereafter.

c. Deflection. The deflection measurement pin was badly bent due to severe rutting and no usable measurements were obtained on item 1.

d. Rolling resistance. Peak and rolling drawbar pulls for 1 pass of the load vehicle were 38.0 and 28.3 kips, respectively.

Item 2. Item 2 was considered failed due to roughness at 49 coverages. The following information was obtained from traffic tests on item 2.

a. Roughness. Average transverse and diagonal differential deformations were 5.35 and 5.00 in., respectively, at 49 coverages. Ruts were less severe with an average depth of 3.28 in. (table 1).

b. Deformation. Figure 15 shows cross-section deformations for three stations along the item at 49 coverages. Profile deformations at the same coverage level are shown in figure 16. The subgrade settled relatively uniformly along the item.

c. Deflection. Total and elastic subgrade deflections were 0.9 and

0.6 in., respectively, at 1 pass and at 49 coverages, showing no change with traffic (table 1).

d. Rolling resistance. Drawbar pull values measured at 1 pass and at 49 coverages showed substantial increases with traffic (table 1). Peak drawbar pull increased from 9.4 to 15.8 kips while rolling drawbar pull increased from 8.2 to 14.8 kips.

Item 3. Item 3 was considered failed due to roughness at 400 coverages. The following information was obtained from traffic tests on item 3.

a. Roughness. Transverse and diagonal differential deformations were the principal roughness factors with average values of 4.50 and 4.68 in., respectively, at failure. Average rut depth was 2.44 in. (table 1).

b. Deformation. Cross-section deformations in figure 15 show the extent of surface deterioration at failure. General settlement along the item length is indicated in the profile deformation plot in figure 16 for 400 coverages.

c. Deflection. Total and elastic subgrade deflections at several coverage levels showed a tendency to increase (table 1). From 1 pass to 400 coverages, total deflection increased from 0.4 to 0.6 in. and elastic deflection from 0.2 to 0.5 in.

d. Rolling resistance. Drawbar pull values at 1 pass, 49 coverages, and 400 coverages are shown in table 1. Peak drawbar pull increased steadily from 7.4 to 11.9 kips, while rolling drawbar pull increased from 6.2 to 9.0 kips after a slight decrease at the intermediate coverage level.

SECTION V: PRINCIPAL FINDINGS

From the foregoing discussion, the principal findings relating test load, wheel assembly, tire inflation pressure, subgrade CBR, and traffic coverages are as follows:

Load, Wheel Assembly, and Tire Pressure	Test Item*	Rated Subgrade CBR	Coverages at Failure
	Lane 33		
252,000-lb load; 12-wheel assembly; 20x20, 22-ply tires at 55-psi inflation pressure	1	2.3	1.25 (1 pass)
	2	4.4	25
	Lane 34		
	1	2.5	1.33 (1 pass)
	2	4.7	49
	3	7.0	400

Note: Traffic results from item 3, lane 33, are omitted because of the unreliable data resulting from an unexplained variation in tire inflation pressure during testing.

* All test items were unsurfaced.

TABLE 1

SUMMARY OF TRAFFIC DATA, TEST SECTION 15

Test Item	Coverages	Rated CBR	Differential Deformation (in.) Longitudinal Max	Longitudinal Avg	Transverse Max	Transverse Avg	Diagonal Max	Diagonal Avg	Rut Depths (in.) Max	Rut Depths (in.) Avg	Drawbar Pull (kips) Peak	Drawbar Pull (kips) Rolling	Total Subgrade Deflection (in.)	Elastic Subgrade Deflection (in.)	Remarks
Lane 33															
1	1 pass	2.3	--	--	--	--	--	--	10.50	9.20	48.8	38.1	--	0.1	Failure due to rutting after 1 pass
2	1 pass	4.4	--	--	--	--	--	--	--	--	11.0	8.4	1.4	0.3	Failure due to roughness at 25 coverages
	25		0.63	0.53	5.50	5.19	5.75	5.47	3.00	2.66	19.1	12.3	2.0	0.3	
3	1 pass	8.1	--	--	--	--	--	--	--	--	8.7	6.6	0.4	0.4	Failure due to roughness at 59 coverages. (Data for item 3 are unreliable due to an unexplained variation in tire inflation pressure that occurred during traffic tests.)
	25		0.75	0.60	1.63	1.44	1.63	1.44	1.63	0.88	8.0	6.0	0.9	0.9	
	59		0.88	0.69	3.50	3.25	3.75	3.38	2.13	2.00	9.3	8.0	0.8	0.5	
Lane 34															
1	1 pass	2.5	--	--	--	--	--	--	11.0	9.70	38.0	28.3	--	--	Failure due to rutting after 1 pass
2	1 pass	4.7	--	--	--	--	--	--	--	--	9.4	8.2	0.9	0.6	Failure due to roughness at 49 coverages
	49		0.38	0.31	6.00	5.35	6.38	5.00	3.63	3.28	15.8	14.8	0.9	0.6	
3	1 pass	7.0	--	--	--	--	--	--	--	--	7.4	6.2	0.4	0.2	Failure due to roughness at 400 coverages
	49		0.25	0.22	1.00	0.78	1.13	0.88	1.00	0.82	8.6	6.0	0.3	0.3	
	133		0.63	0.56	3.00	2.66	2.50	2.25	1.38	1.10	--	--	--	--	
	313		0.63	0.53	4.13	3.75	4.25	3.97	3.00	2.44	--	--	0.5	0.4	
	400		0.63	0.56	5.00	4.50	5.25	4.68	3.00	2.44	11.9	9.0	0.6	0.5	

Note: For trafficking lanes 33 and 34, a 12-wheel assembly (four abreast, three rows) with 20x20, 22-ply tires inflated to 55 psi was used. A 252,000-lb load was used on both lanes, and the wheel spacing for the assembly was 34-44-34 in. c-c abreast and 123 in. in tandem.

TABLE 2

SUMMARY OF CBR, DENSITY, AND WATER CONTENT DATA, TEST SECTION 15

Test Item	Coverages	Depth (in.)	CBR	Water Content %	Dry Density lb/cu ft
		Lane 33			
1	0	0	1.8	30.9	87.9
		6	2.1	30.1	88.1
		12	2.2	30.1	90.1
	1 pass	0	2.2	30.5	88.8
		6	2.4	30.3	89.1
		12	2.9	30.9	88.4
2	0	0	3.8	29.8	89.9
		6	4.0	29.9	88.8
		12	4.6	29.7	89.4
	25	0	5.1	28.7	90.4
		6	4.5	31.6	86.8
		12	4.1	31.3	87.6
3	0	0	7.5	24.5	93.3
		6	8.0	27.0	94.4
		12	10.0	25.5	94.1
	59	0	8.0	26.2	94.3
		6	6.3	26.2	94.9
		12	9.0	26.0	96.0
		Lane 34			
1	0	0	2.2	30.0	88.8
		6	2.4	29.0	91.1
		12	2.8	29.9	89.4
2	0	0	5.1	28.7	90.4
		6	4.5	31 6	86.8
		12	4.1	31.3	87.6
	49	0	4.9	27.6	91.7
		6	4.8	29.4	89.3
		12	4.9	27.4	92.0
3	0	0	8.0	26.2	94.3
		6	6.3	26.2	94.9
		12	9.0	26.0	96.0
	400	0	8.0	24.7	99.9
		6	5.1	[illegible]	98.5
		12	5.6	27.1	94.9

Note: Subgrade material was a heavy clay (buckshot; classified as CH) in all items.

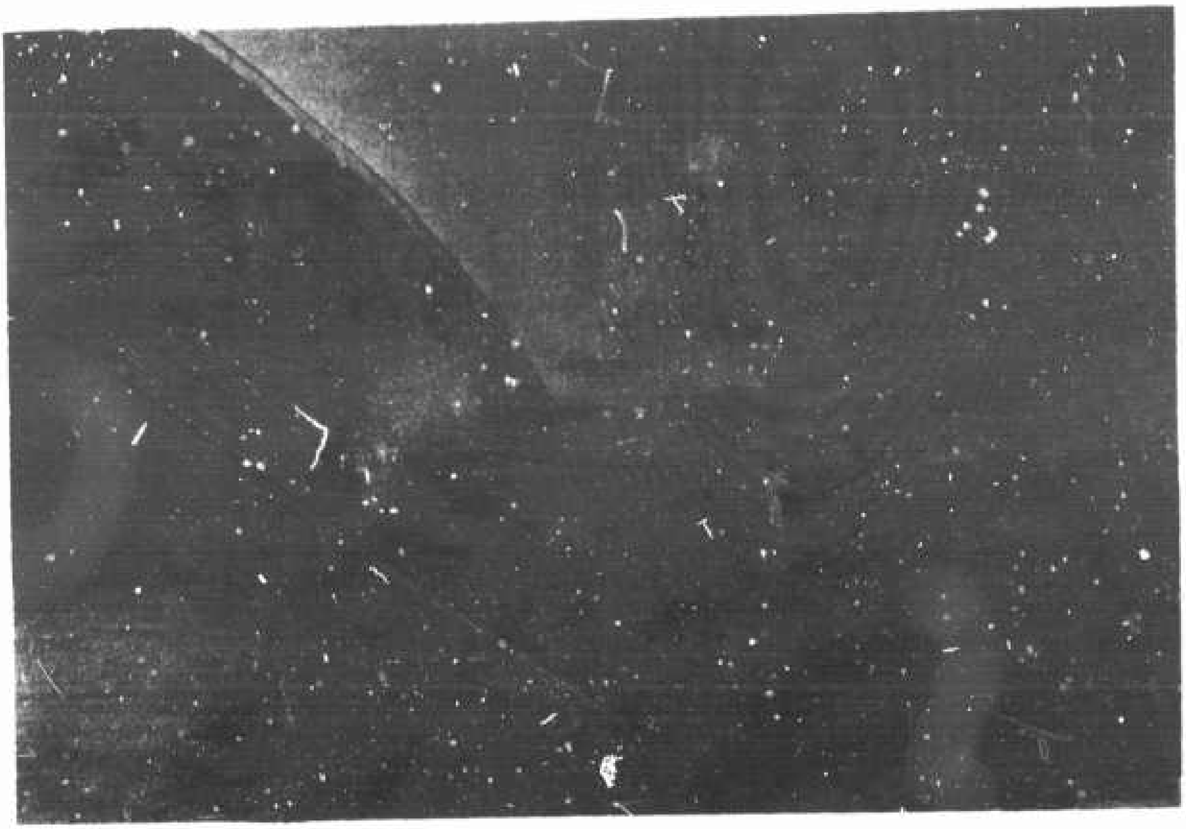


Figure 2. Test load vehicle

Figure 3. Item 1, lane 33, prior to traffic

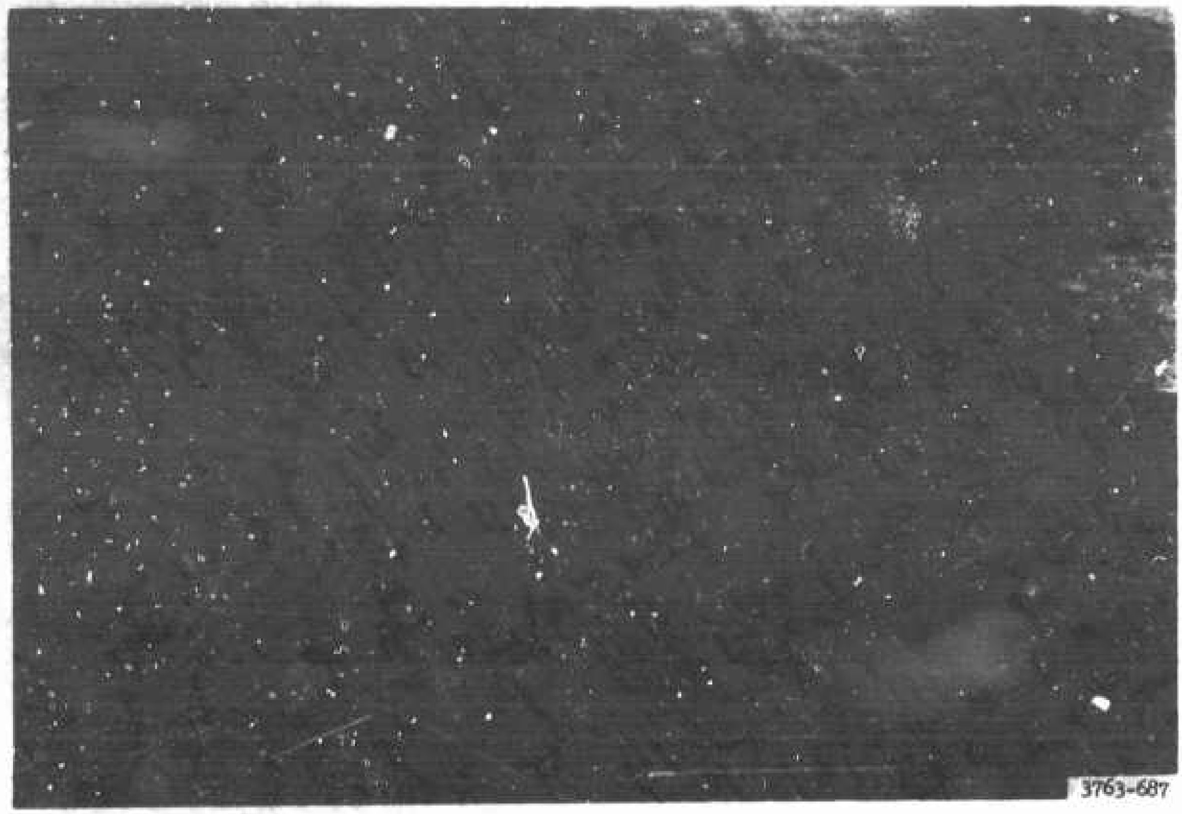


Figure 4. Item 1, lane 33, at 1 pass (failure)

Figure 5. Item 2, lane 33, prior to traffic

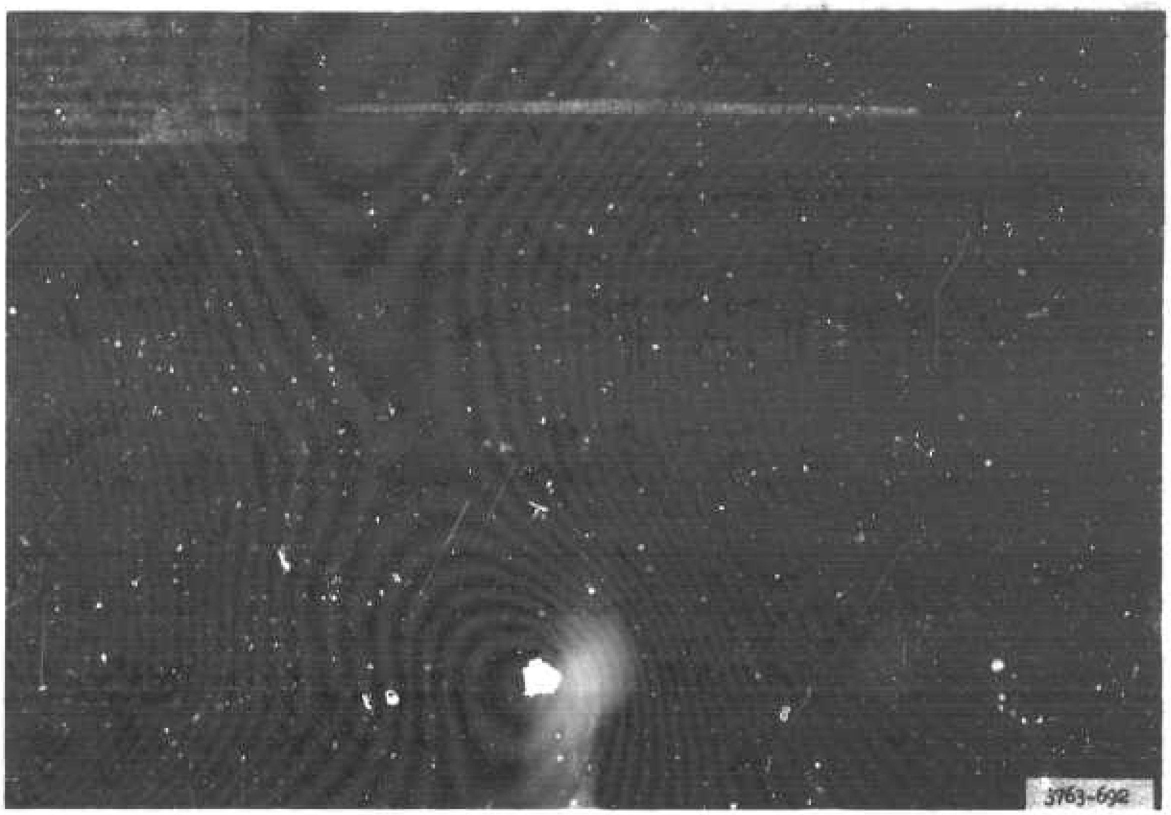


Figure 6. Item 2, lane 33. Transverse straightedge shows roughness at 25 coverages (failure)

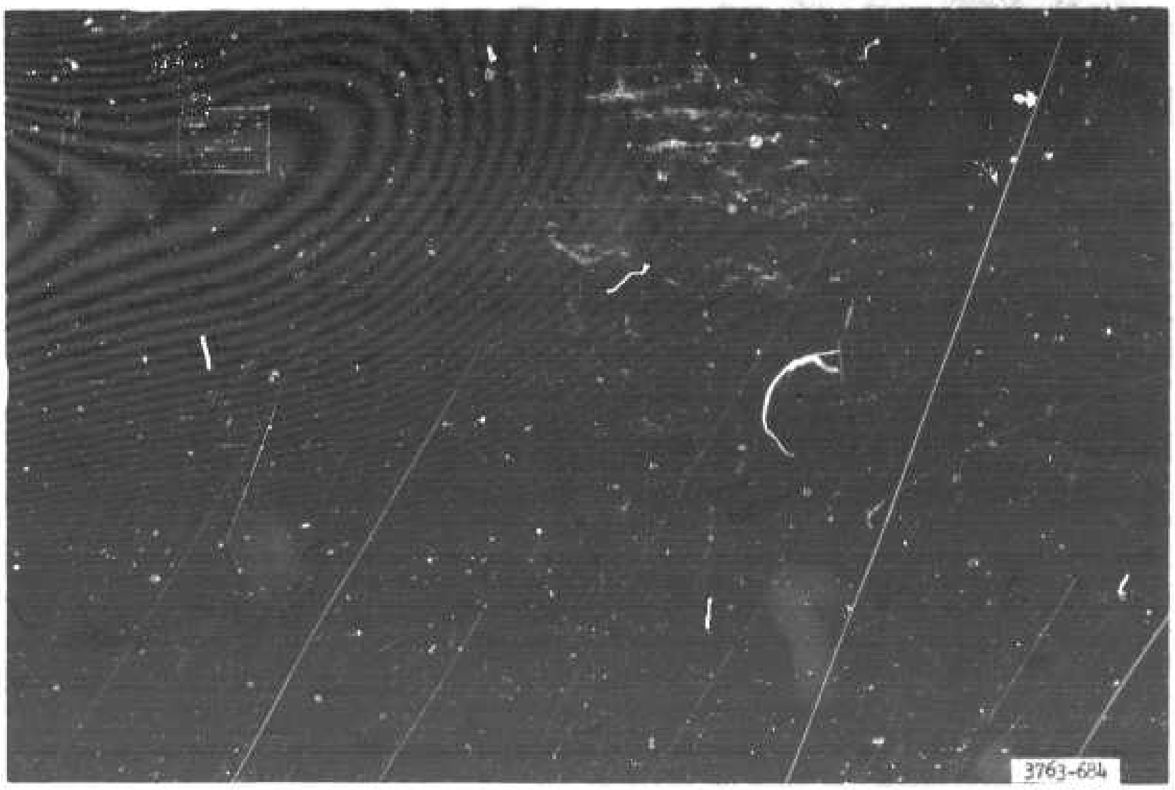


Figure 7. Item 3, lane 33, prior to traffic

Figure 8. Item 3, lane 33. Transverse straightedge shows roughness at 59 coverages (failure)

Figure 9. Item 1, lane 34. Transverse straightedge shows roughness at 1 pass (failure)

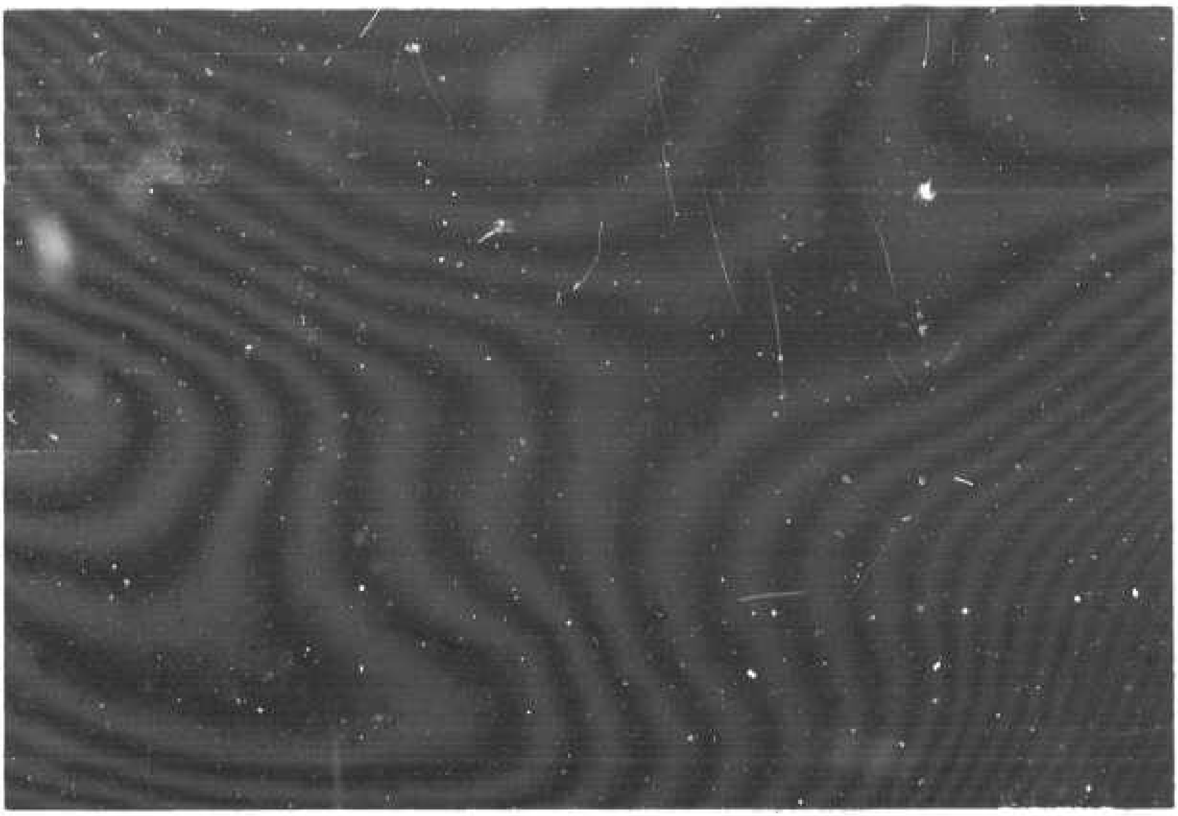
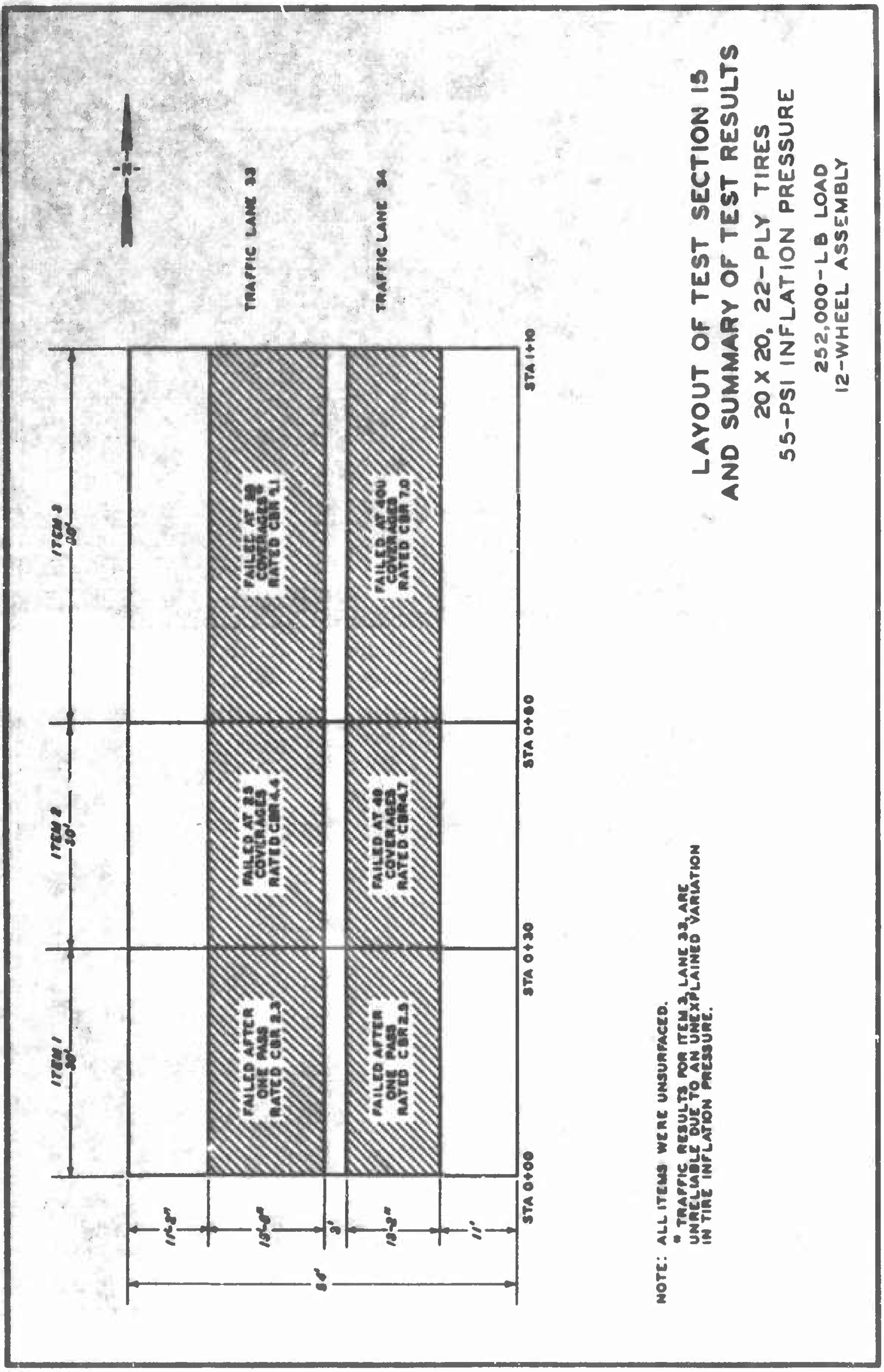


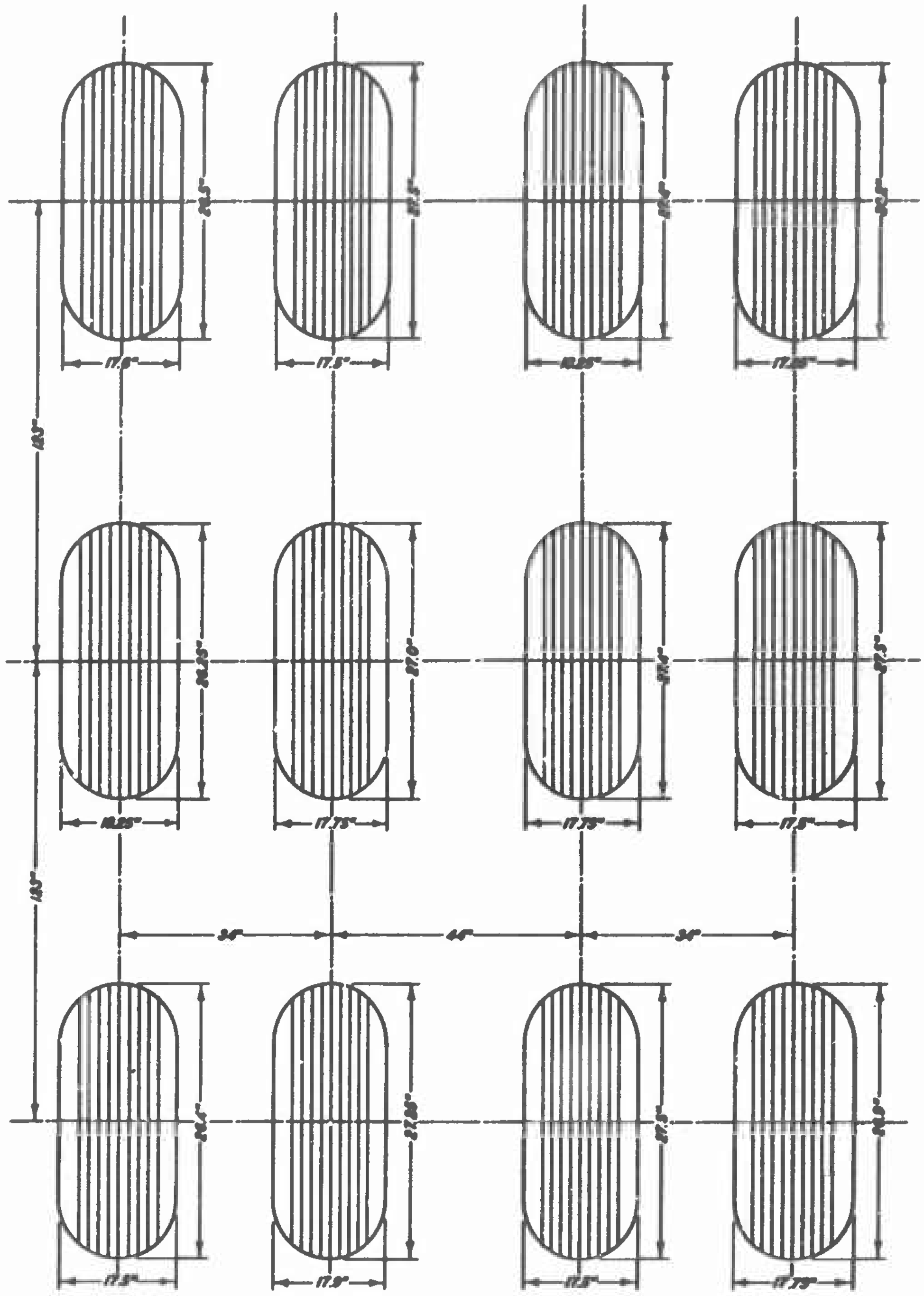
Figure 10. Item 2, lane 34. Transverse straightedge shows roughness at 49 coverages (failure)

Figure 11. Item 3, lane 34. Transverse straighedge shows roughness at 400 coverages (failure)



LAYOUT OF TEST SECTION 15
AND SUMMARY OF TEST RESULTS
20 X 20, 22-PLY TIRES
55-PSI INFLATION PRESSURE
252,000-LB LOAD
12-WHEEL ASSEMBLY
TRAFFIC LANE 33
TRAFFIC LANE 34
ITEM 1 30'
ITEM 2 30'
ITEM 3
FAILED AFTER ONE PASS RATED CBR 2.3
FAILED AFTER ONE PASS RATED CBR 2.8
FAILED AT 25 COVERAGES RATED CBR 4.4
FAILED AT 48 COVERAGES RATED CBR 4.7
FAILED AT 400 COVERAGES RATED CBR 7.0
STA 0+00
STA 0+30
STA 0+60
NOTE: ALL ITEMS WERE UNSURFACED.
* TRAFFIC RESULTS FOR ITEM 3, LANE 33, ARE UNRELIABLE DUE TO AN UNEXPLAINED VARIATION IN TIRE INFLATION PRESSURE.

Figure 12



TIRE SIZE	20.00-20
NO. OF PLYS	22
AVERAGE CONTACT AREA, SQ IN.	[illegible]
AVERAGE CONTACT PRESSURE, PSI	53
INFLATION PRESSURE, PSI	55
AVERAGE DEFLECTION, %	36
GROSS ASSEMBLY LOAD = 252,000 LB	

TIRE-PRINT DIMENSIONS AND TIRE CHARACTERISTICS

TEST SECTION 15
LANES 33 AND 34

Figure 13

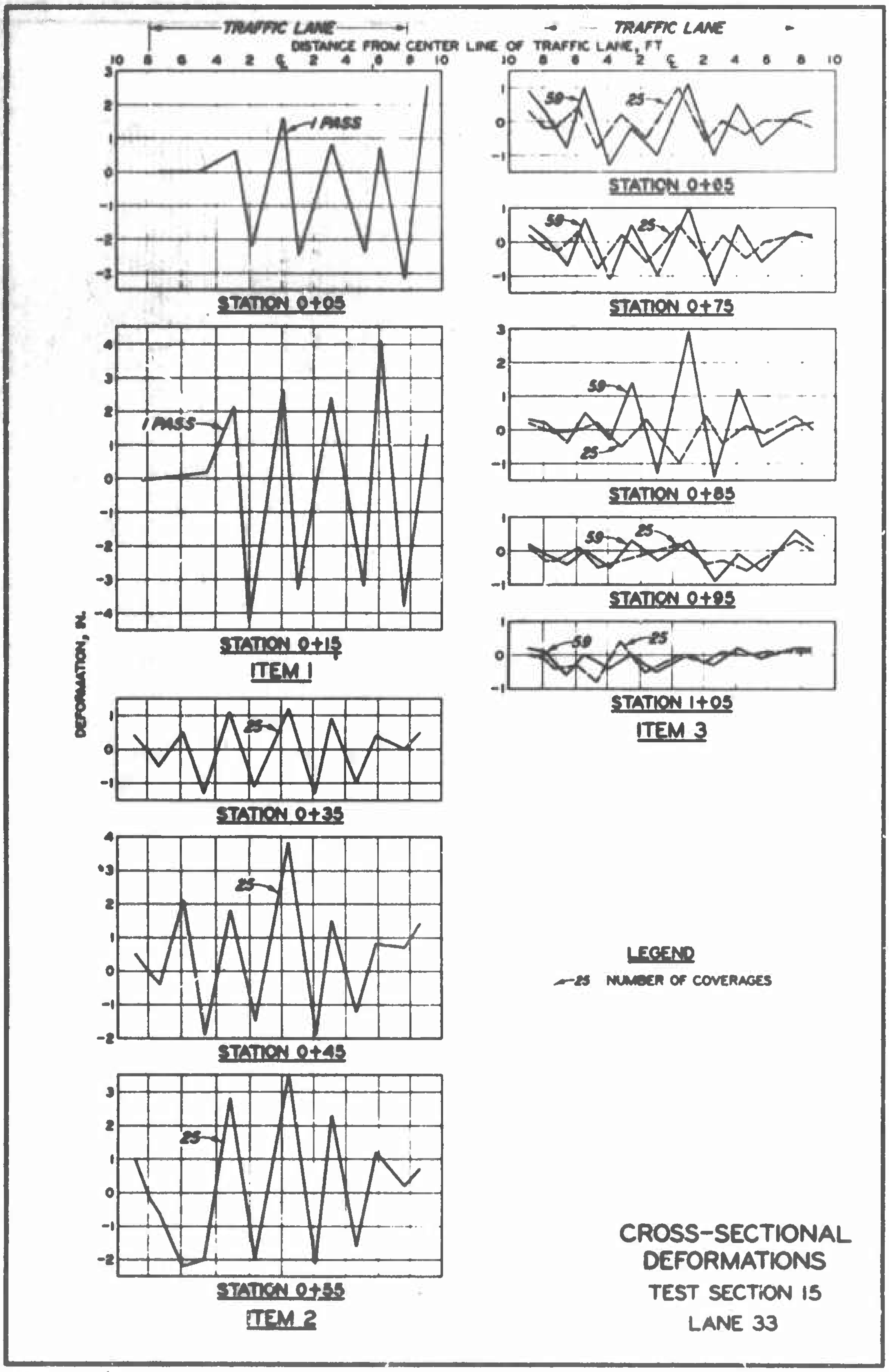
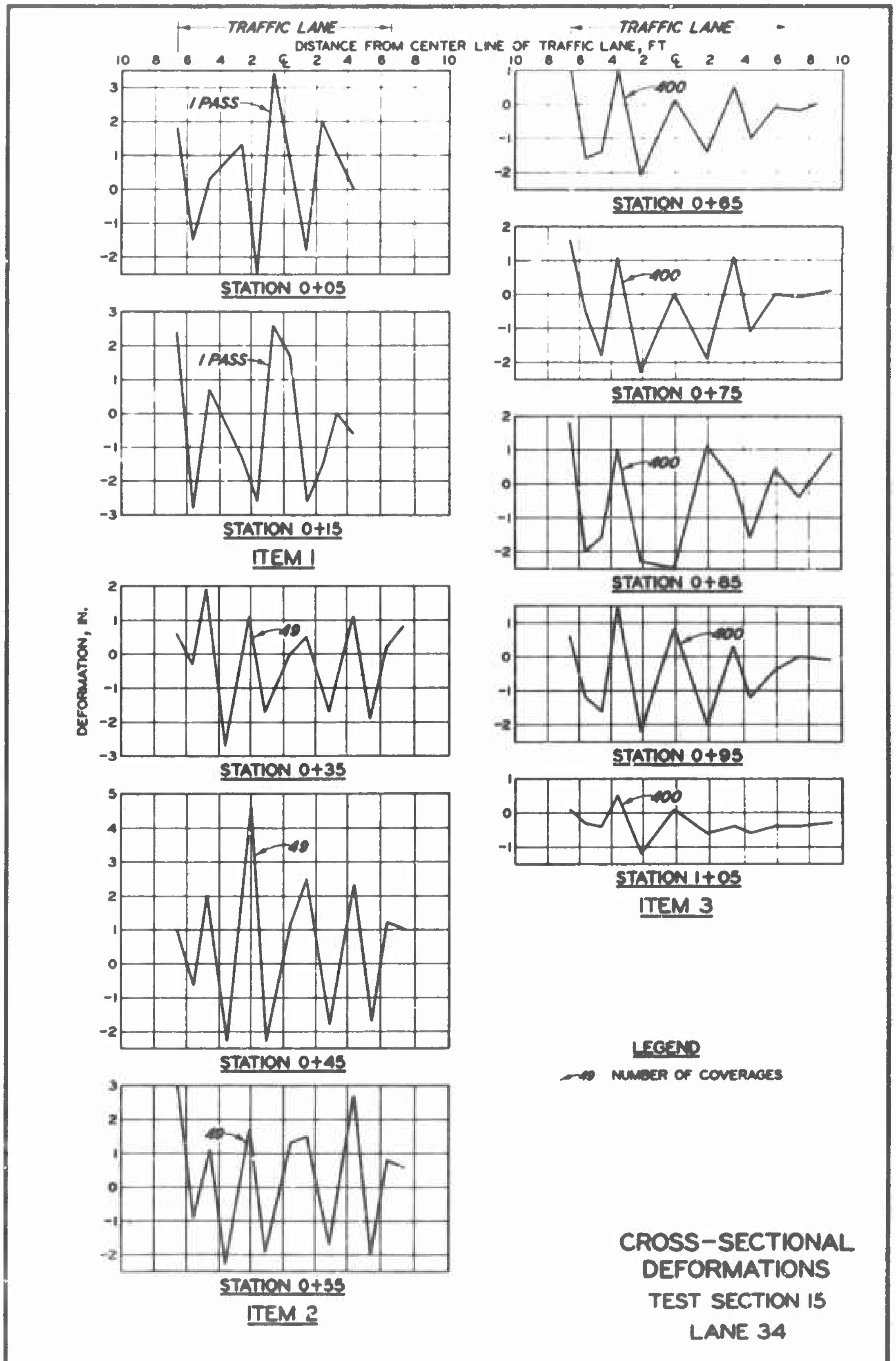

TRAFFIC LANE
DISTANCE FROM CENTER LINE OF TRAFFIC LANE, FT
DEFORMATION, IN.
1 PASS
STATION 0+05
STATION 0+15
ITEM 1
25
STATION 0+35
STATION 0+45
STATION 0+55
ITEM 2
50
STATION 0+65
STATION 0+75
STATION 0+85
STATION 0+95
STATION 1+05
ITEM 3
LEGEND
25 NUMBER OF COVERAGES
CROSS-SECTIONAL
DEFORMATIONS
TEST SECTION 15
LANE 33

Figure 14



TRAFFIC LANE
TRAFFIC LANE
DISTANCE FROM CENTER LINE OF TRAFFIC LANE, FT
DEFORMATION, IN.
1 PASS
STATION 0+05
1 PASS
STATION 0+15
ITEM 1
49
STATION 0+35
49
STATION 0+45
49
STATION 0+55
ITEM 2
400
STATION 0+65
400
STATION 0+75
400
STATION 0+85
400
STATION 0+95
400
STATION 1+05
ITEM 3
LEGEND
49 NUMBER OF COVERAGES
CROSS-SECTIONAL DEFORMATIONS
TEST SECTION 15
LANE 34

Figure 15

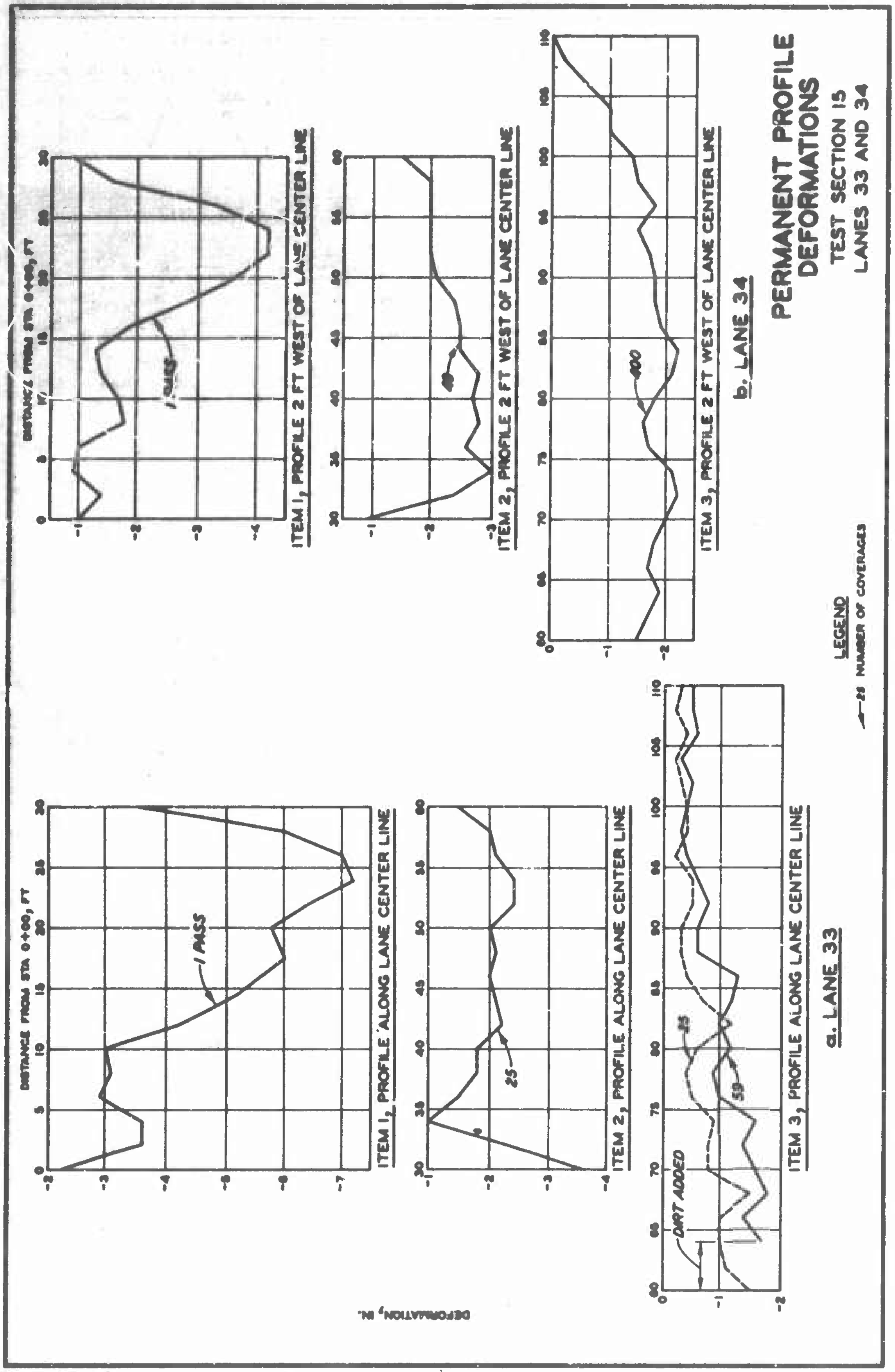

PERMANENT PROFILE DEFORMATIONS
TEST SECTION 15
LANES 33 AND 34
ITEM 1, PROFILE ALONG LANE CENTER LINE
ITEM 2, PROFILE ALONG LANE CENTER LINE
ITEM 3, PROFILE ALONG LANE CENTER LINE
a. LANE 33
ITEM 1, PROFILE 2 FT WEST OF LANE CENTER LINE
ITEM 2, PROFILE 2 FT WEST OF LANE CENTER LINE
ITEM 3, PROFILE 2 FT WEST OF LANE CENTER LINE
b. LANE 34
DEFORMATION, IN.
DISTANCE FROM STA 0+00, FT
1 PASS
DIRT ADDED
LEGEND
NUMBER OF COVERAGES

Figure 16

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R&D		
(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)		
1. ORIGINATING ACTIVITY (Corporate author) U. S. Army Engineer Waterways Experiment Station	2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	2b. GROUP
3. REPORT TITLE Aircraft Ground-Flotation Investigation Part XVI Data Report on Test Section 15		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Final Technical Report		
5. AUTHOR(S) (Last name, first name, initial) Watkins, J. E. Hill, W. J., Jr.		
6. REPORT DATE September 1966	7a. TOTAL NO. OF PAGES 22	7b. NO. OF REFS
8a. CONTRACT OR GRANT NO. MIPR AS-4-177 b. PROJECT NO. 410A c. d.	9a. ORIGINATOR'S REPORT NUMBER(S) AFFDL-TR-66-43, Part XVI. 9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) None	
10. AVAILABILITY/LIMITATION NOTICES This document is subject to special export controls and each transmittal to foreign governments or foreign nationals may be made only with prior approval of the Air Force Flight Dynamics Laboratory (FDFM), Wright-Patterson AFB, Ohio 45433.		
11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY Air Force Flight Dynamics Laboratory Research and Technology Division AF Systems Command, WPAFB, Ohio	
13. ABSTRACT This data report describes the results of work undertaken as part of an overall program to develop ground-flotation criteria for the C-5A aircraft.		

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Security Classification

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14. KEY WORDS	LINK A ROLE	LINK A WT	LINK B ROLE	LINK B WT	LINK C ROLE	LINK C WT
Aircraft Ground Flotation Rolling Resistance Rear Area Airfields Support Area Airfields Forward Area Airfields Vehicle Mobility						

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