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THE KANSAS TEST TRACK
PART II - APPENDICES

NOVEMBER 1979
FINAL REPORT

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FEDERAL RAILROAD ADMINISTRATION
Office of Research and Development
Washington, D.C. 20590

01-Track & Structures

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16. Abstract

This report presents data obtained from an experimental project to compare the performance of different track support systems. Also, it describes instruments used for data measurement, their location in track, and test procedures.

Analysis and evaluation of test data are presented in Part I of the report.

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PREFACE

This report has been prepared as a part of a subcontract between the Atchison, Topeka, and Santa Fe Railroad and the Construction Technology Laboratories of the Portland Cement Association.

The report presents data obtained from the Kansas Test Track. Also, it describes instruments used for data measurement, their location in track, and test procedures. Analysis and evaluation of test data are presented in Part I of the report.

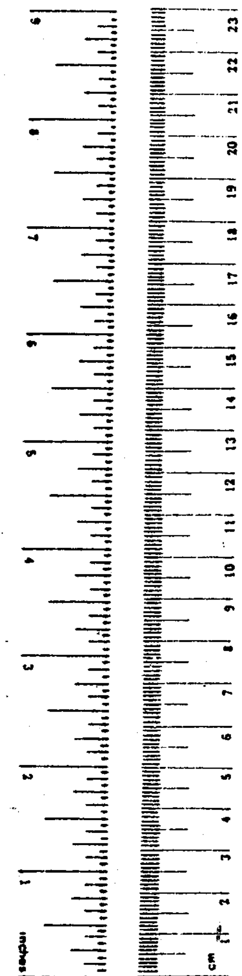
Work on the project was carried out by the Transportation Development Section under the direction of Bert E. Colley and the Structural Development Section under the direction of W. Gene Corley and Henry G. Russell. Particular recognition is given to Richard D. Ward, William Hummerich, Jr., George Fessler, and other project staff for their assistance and suggestions in the design, installation, and monitoring of the instrumentation.

Dr. R. M. McCafferty and Mr. W. B. O'Sullivan of FRA were the technical monitors for the work reported herein. Their cooperation and suggestions are gratefully acknowledged. Also, the cooperation and assistance provided by the Atchison, Topeka, and Santa Fe Railroad, in particular that of Mr. W. S. Tuinstra and W. S. Autrey is acknowledged.

METRIC CONVERSION FACTORS

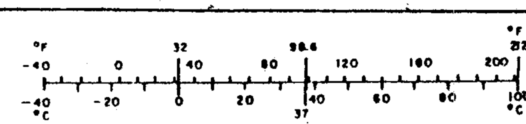
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
	AREA			
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
	MASS (weight)			
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
	VOLUME			
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
	TEMPERATURE (exact)			
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
	AREA			
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
	TEMPERATURE (exact)			
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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INTRODUCTION

In the early 1970's the Federal Railroad Administration (FRA) and the Atchison, Topeka and Santa Fe Railway Company (ATSF) jointly sponsored an investigation to evaluate the performance of different track support systems. For this purpose, a 1.8-mile long test track consisting of nine sections was constructed adjacent to the mainline track of the ATSF, between Aikman and Chelsea, Kansas. These test sections included continuously reinforced concrete slabs, reinforced concrete twin beams, prestressed concrete ties, stablized ballast, and standard wood-tie track sections. The site was chosen because of abundant rail traffic, a long tangential section of track, relatively flat uniform grade, and climatic conditions typical of vast areas in the continental United States.

The test track was designed and constructed by several organizations under sub-contract to ATSF, the project administrator. The Construction Technology Laboratories (CTL), a division of Portland Cement Association (PCA), was engaged to instrument the test track, obtain data periodically, reduce and analyze data, and submit a report covering the findings. The design, development, and preparation of installation specifications for a new rail fastening anchorage system, to replace the one originally installed in the slab and beam test sections, also was done by PCA.

Analysis and evaluation of data obtained from instrumentation installed in the different test sections are presented in Part I of this report. Details of instruments used for data measurement and their location in track, test procedures, and test data are presented in this report.

APPENDIX A
DETAILS OF INSTRUMENTATION

General details of the instrumentation layout for the test sections is presented in this appendix. Also included is information on the design and instrumentation details of the load cell ties and rail load sensors. Details of the other instrumentation are presented in Appendix F.

Instrumentation of Cross Tie Track Sections

Instrument locations in cross tie track sections are shown in Figures A1 to A4.

Strain gages were placed longitudinally on a rail cross section at positions shown in Figure A5. Strain gage locations were marked on the rail using the sheet metal jig. A typical installation is shown in Figure A6.

Strain gages were placed on concrete and timber ties at cross sections directly under the rail seat and tie midlength at positions shown in Figure A7. General views of strain gages on ties are shown in Figure A8.

Linear variable differential transformers (LVDT) with one inch stroke were used to sense rail and tie deflections. The LVDT's were placed so as not to obstruct train movements. The LVDT assemblies are shown in Figures A9 and A10.

Instrumentation of Beam and Slab Sections

Instrument locations in beam Sections 4 and 7, and slab Sections 5 and 5-1, are shown in Figures A11 and A12, respectively. Instrumentation in beam Section 4-1 is shown in Figure A13. All main array instrumentation was located within a 10 ft track section. The only exception was single-position vertical extensometers which were installed by Sannon and Wilson, Inc. 100-, 200-, and 300-ft east, and 100-ft west of the main multi-position extensometers.

Deflectometers were installed on the north side of the slab and beams at middistance between joints, and at both sides of the west joint as shown in Figures A11 and A12. In Section

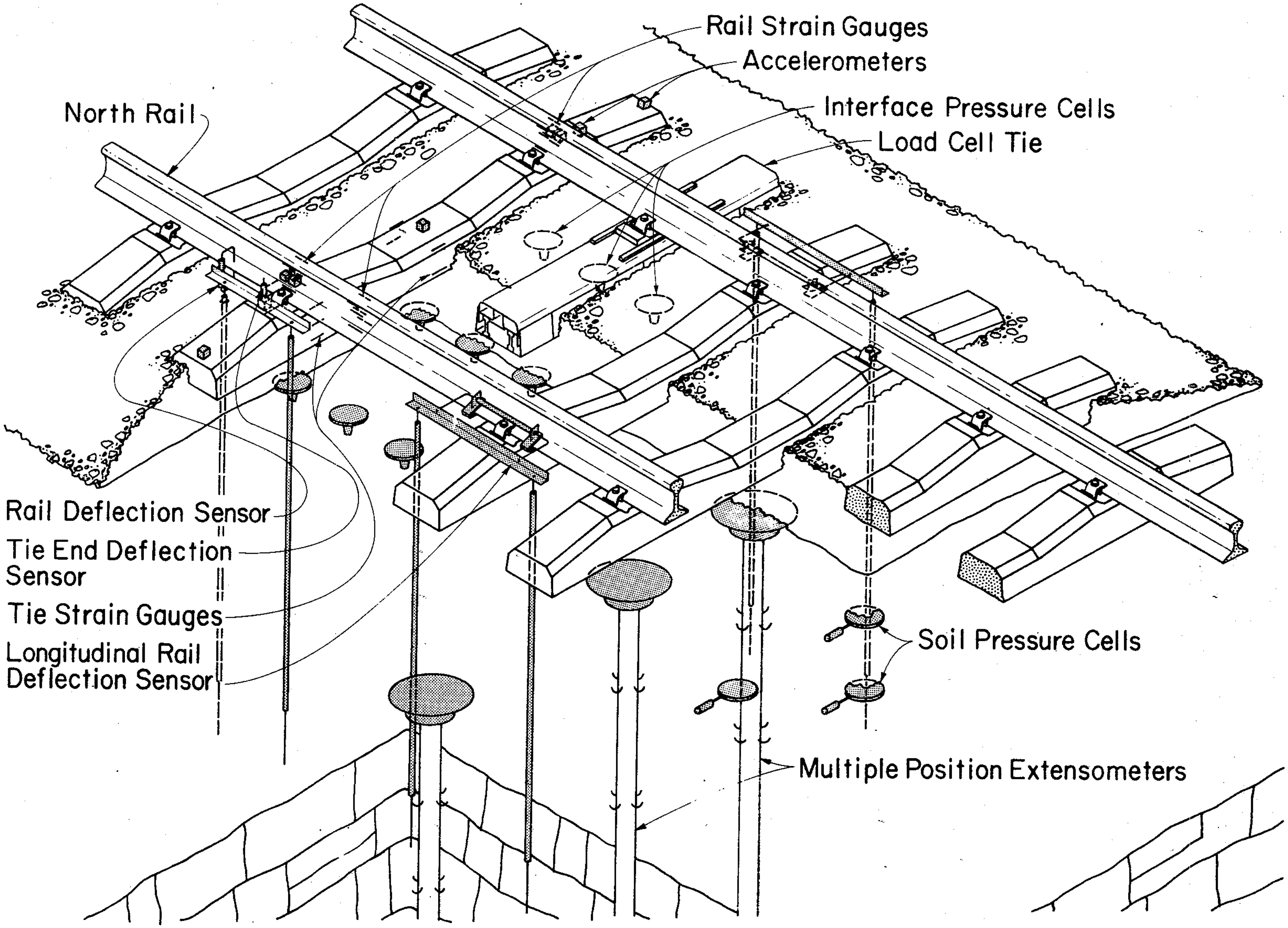


FIGURE A1 - INSTRUMENTS AT MAIN ARRAY

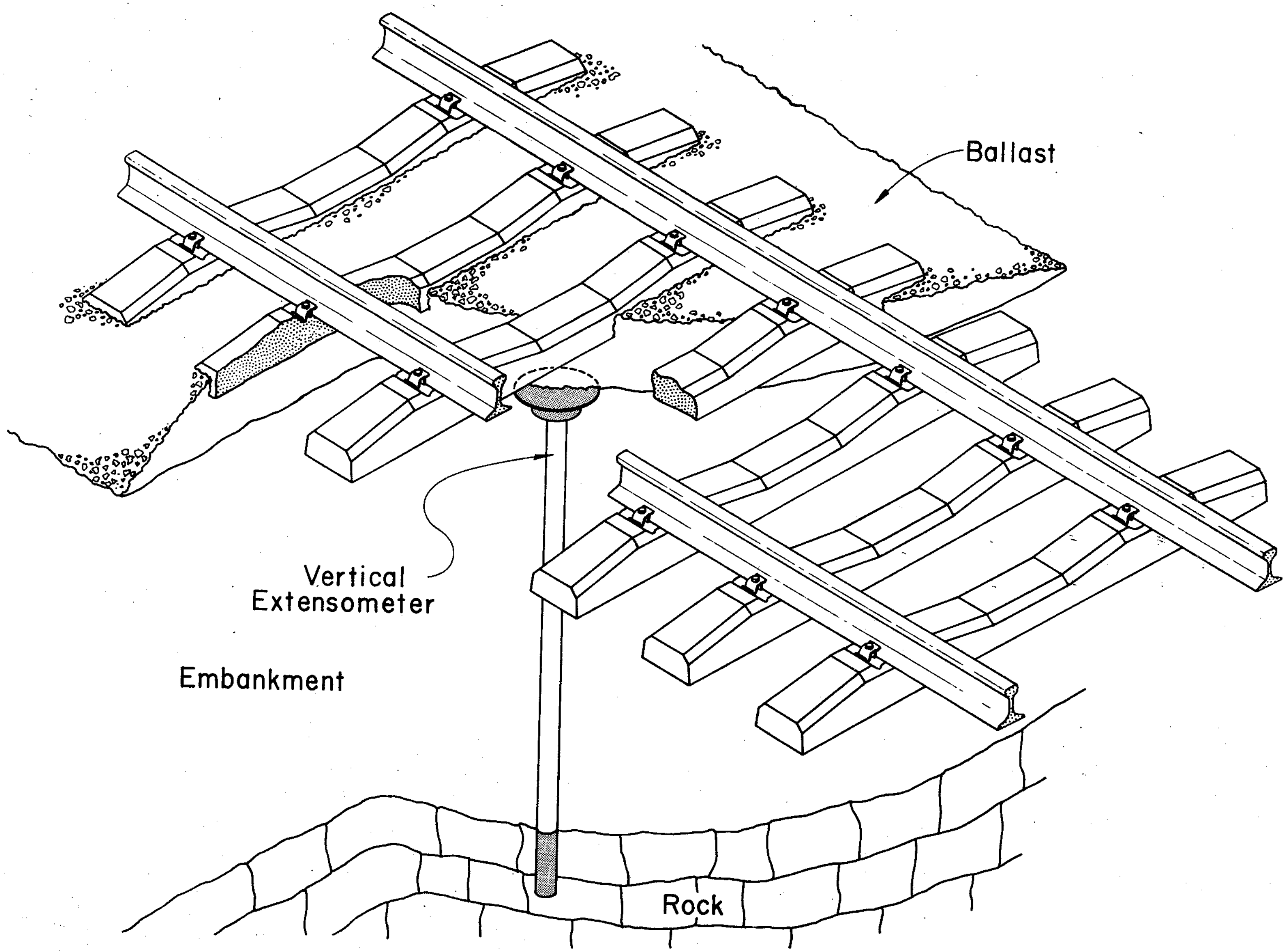


FIGURE A2 - INSTRUMENTS AT "A" LOCATIONS

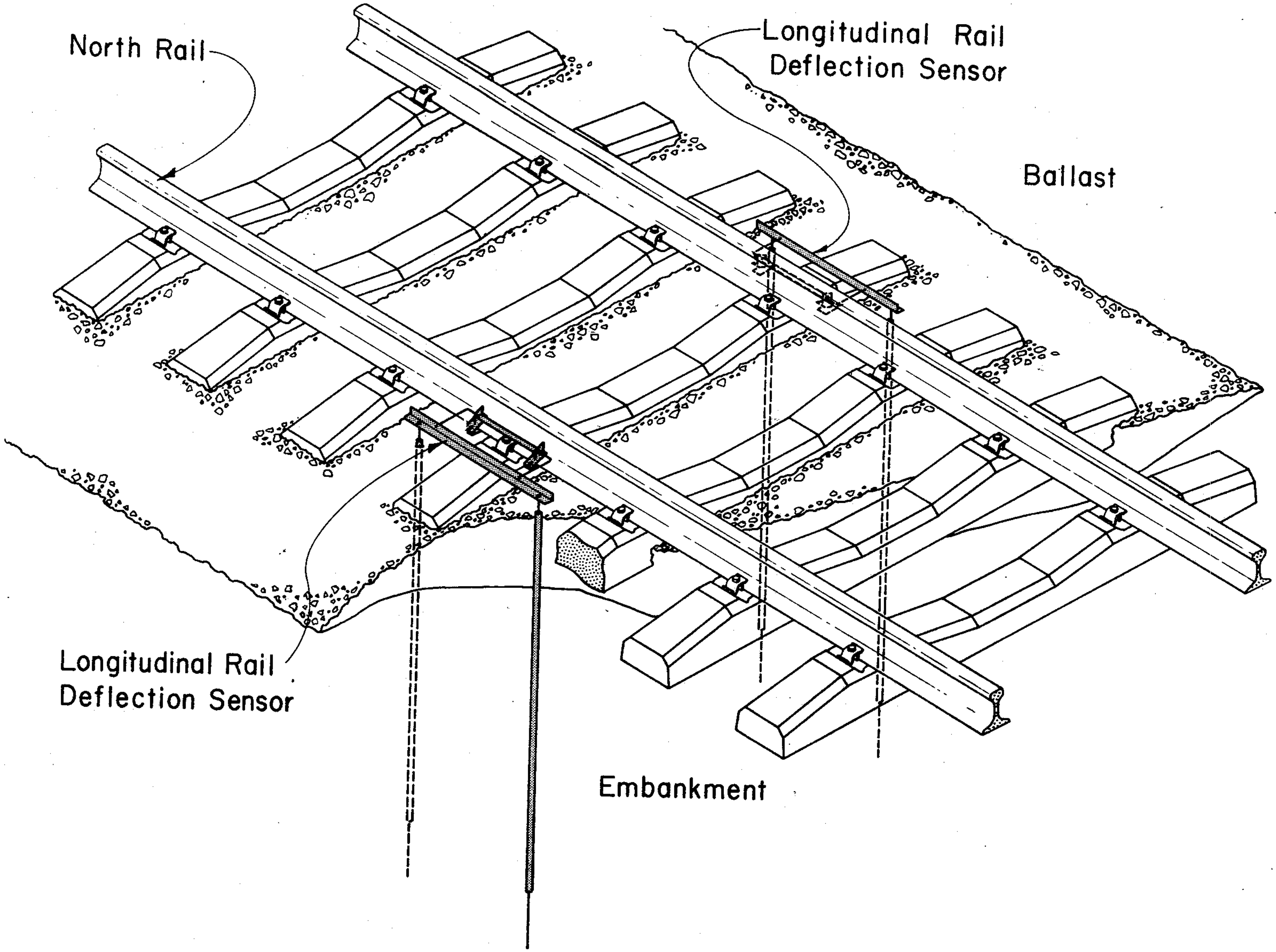


FIGURE A3 - INSTRUMENTS AT "B" LOCATIONS

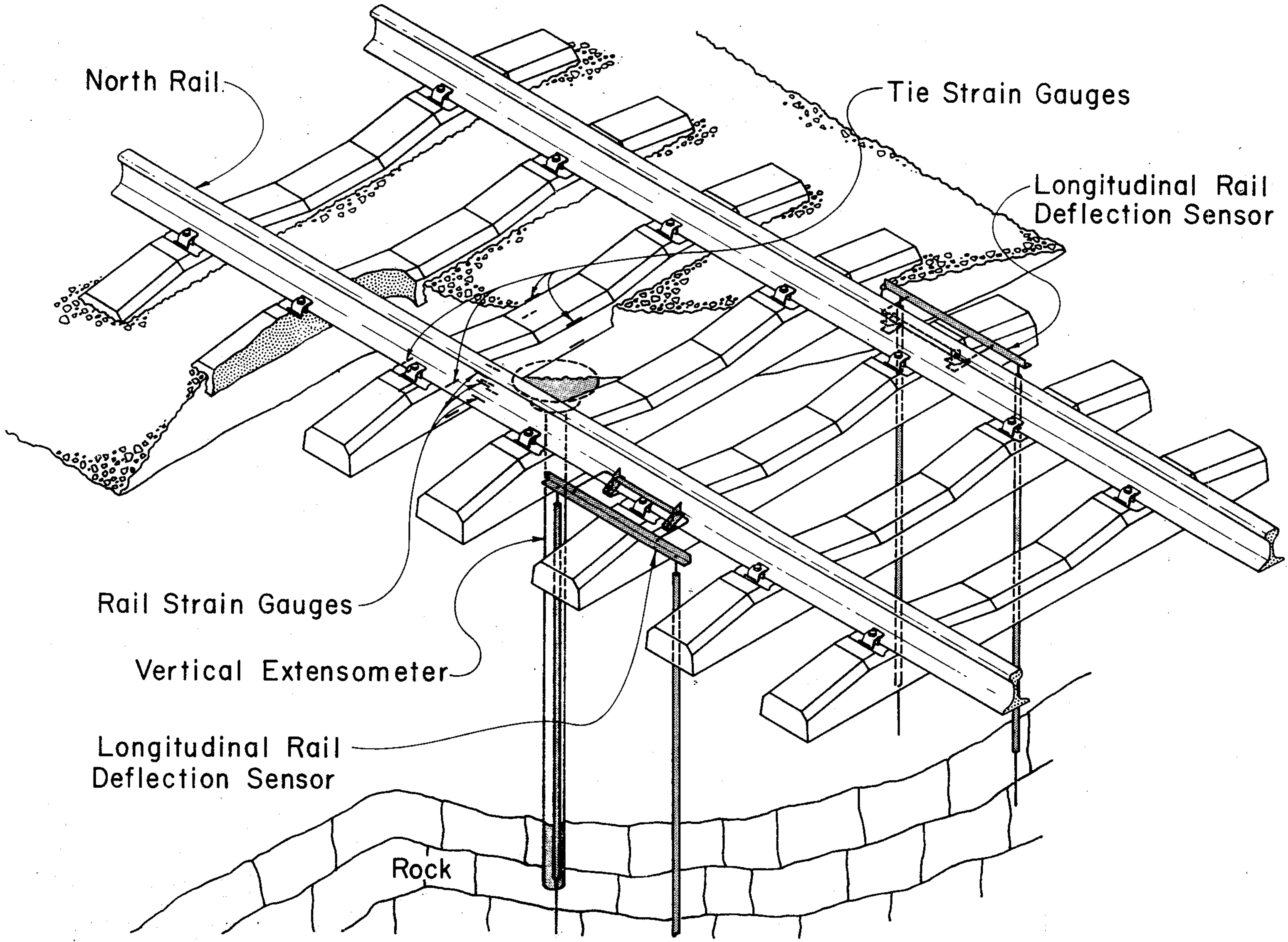


FIGURE A4 - INSTRUMENTS AT "C" LOCATION

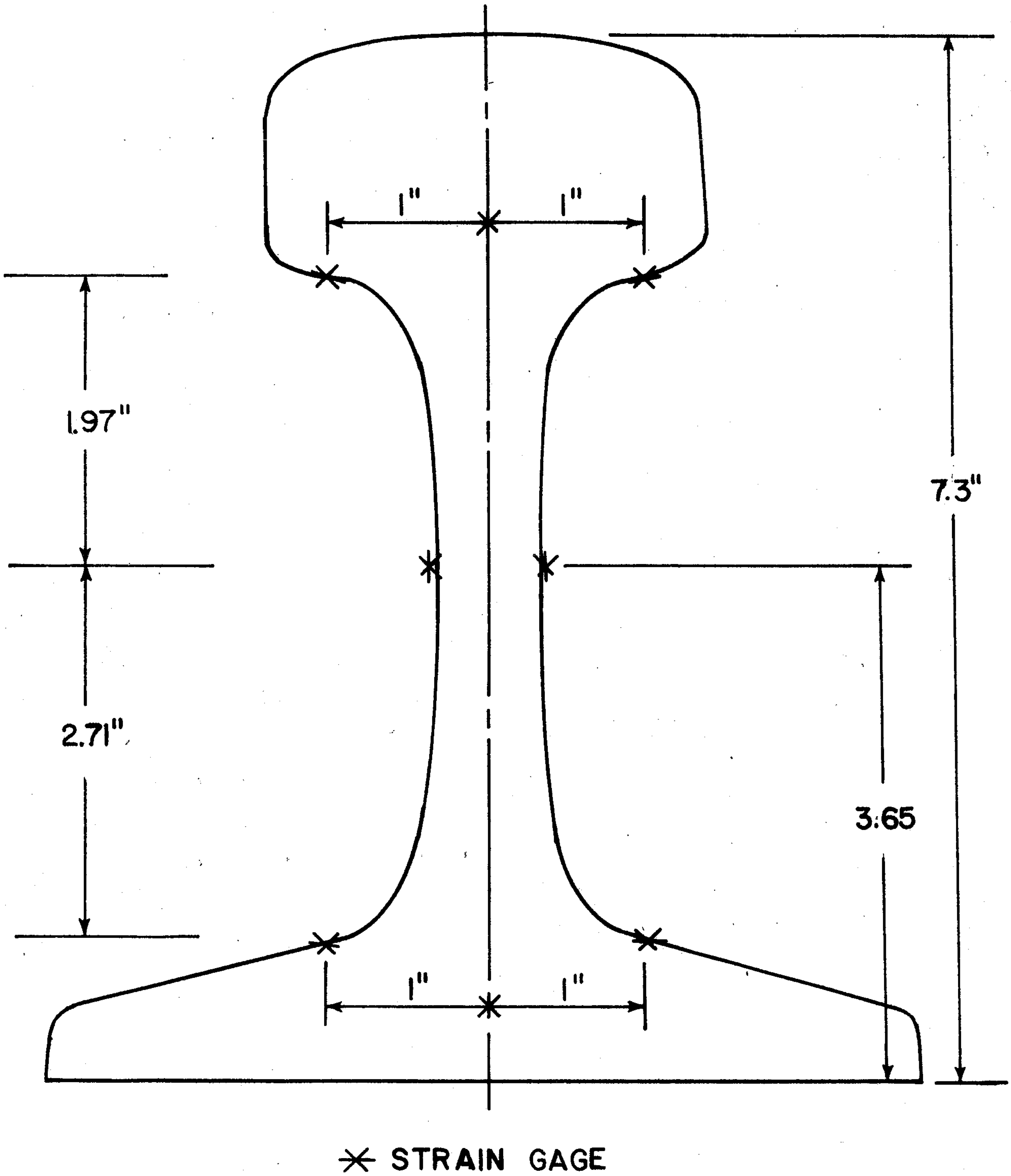


FIGURE A5 - LOCATION OF STRAIN GAGES ON RAIL CROSS SECTION

FIGURE A6 - STRAIN GAGES ON RAIL

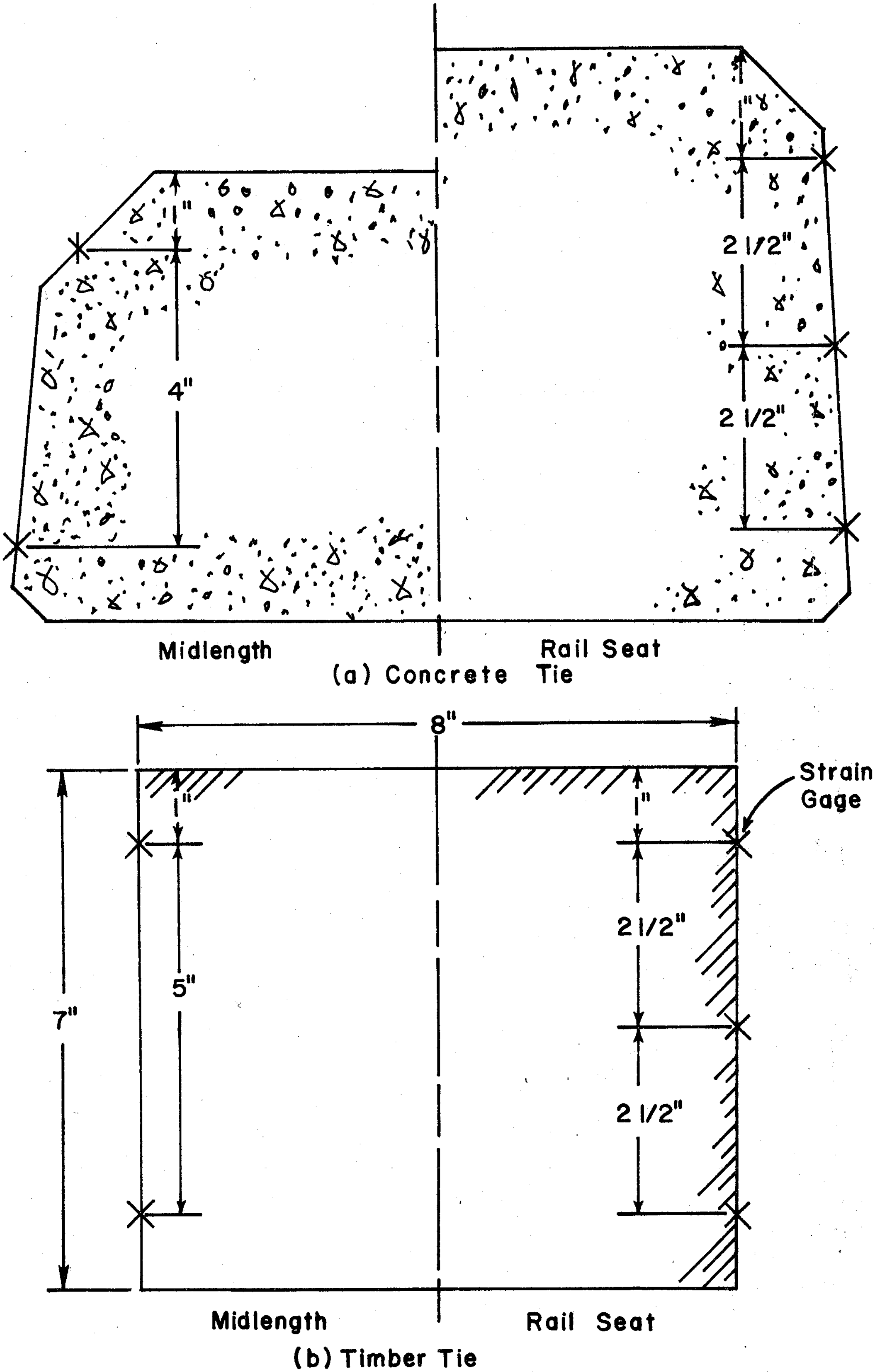


FIGURE A7 - STRAIN GAGE LOCATIONS ON TIES

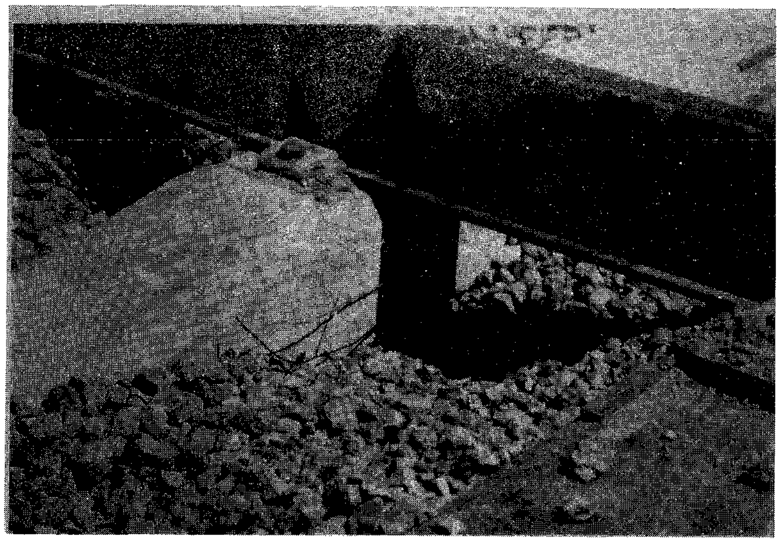


FIGURE A8 - STRAIN GAGES ON TIES

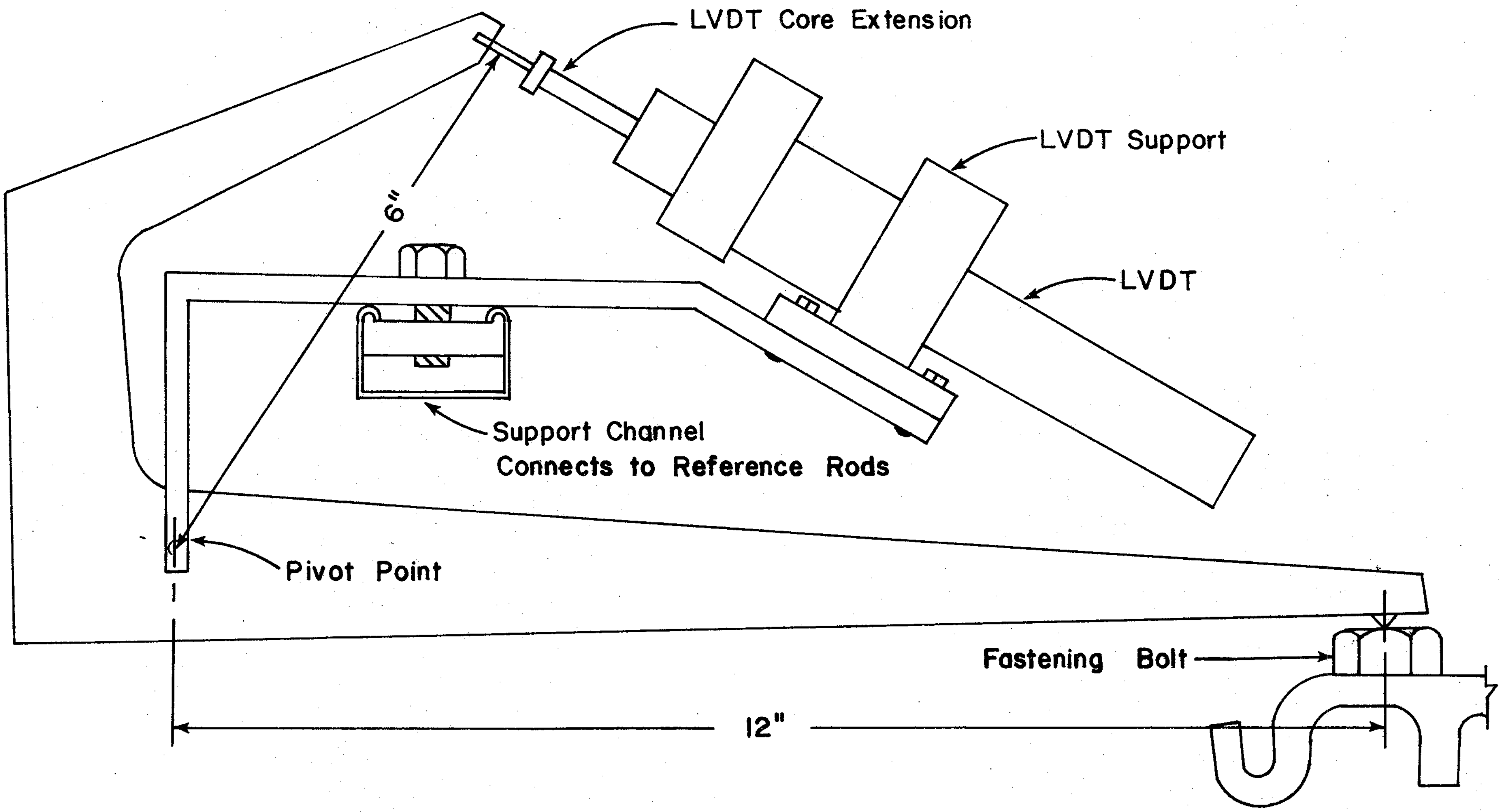
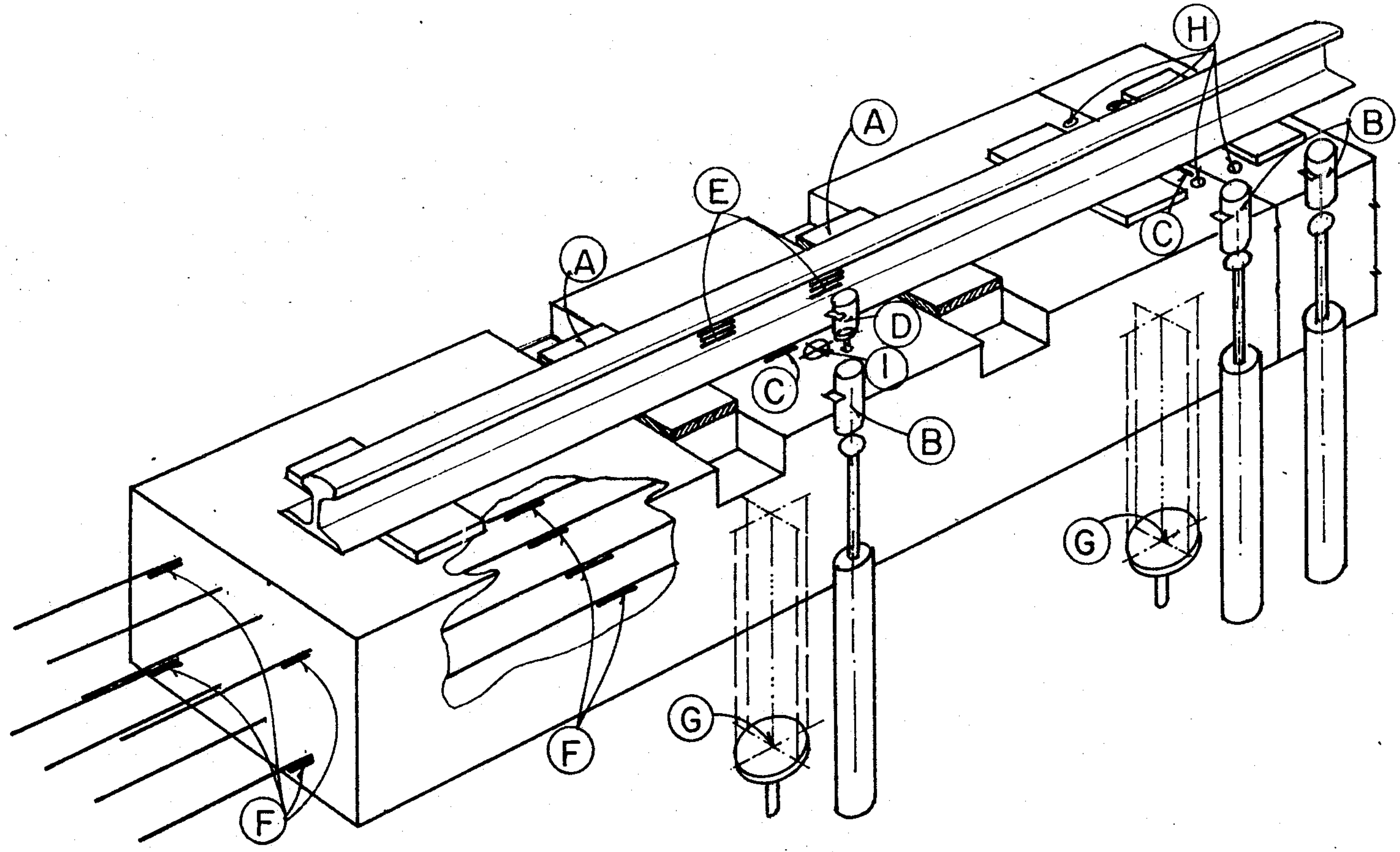


FIGURE A9 - VERTICAL DEFLECTION DEVICE

FIGURE A10 - DEFLECTION MEASUREMENT ASSEMBLY



Ⓐ- Rail Load Sensors— both rails.

Ⓑ- Beam Deflection Meters— both sides of joint and midspan.

Ⓒ- Concrete Strain Gages— top, mid and bottom at midspan— top and bottom at joints.

Ⓓ-Rail Deflection— both rails.

Ⓔ-Rail Strain Gages—top, mid and bottom at both sides of both rails.

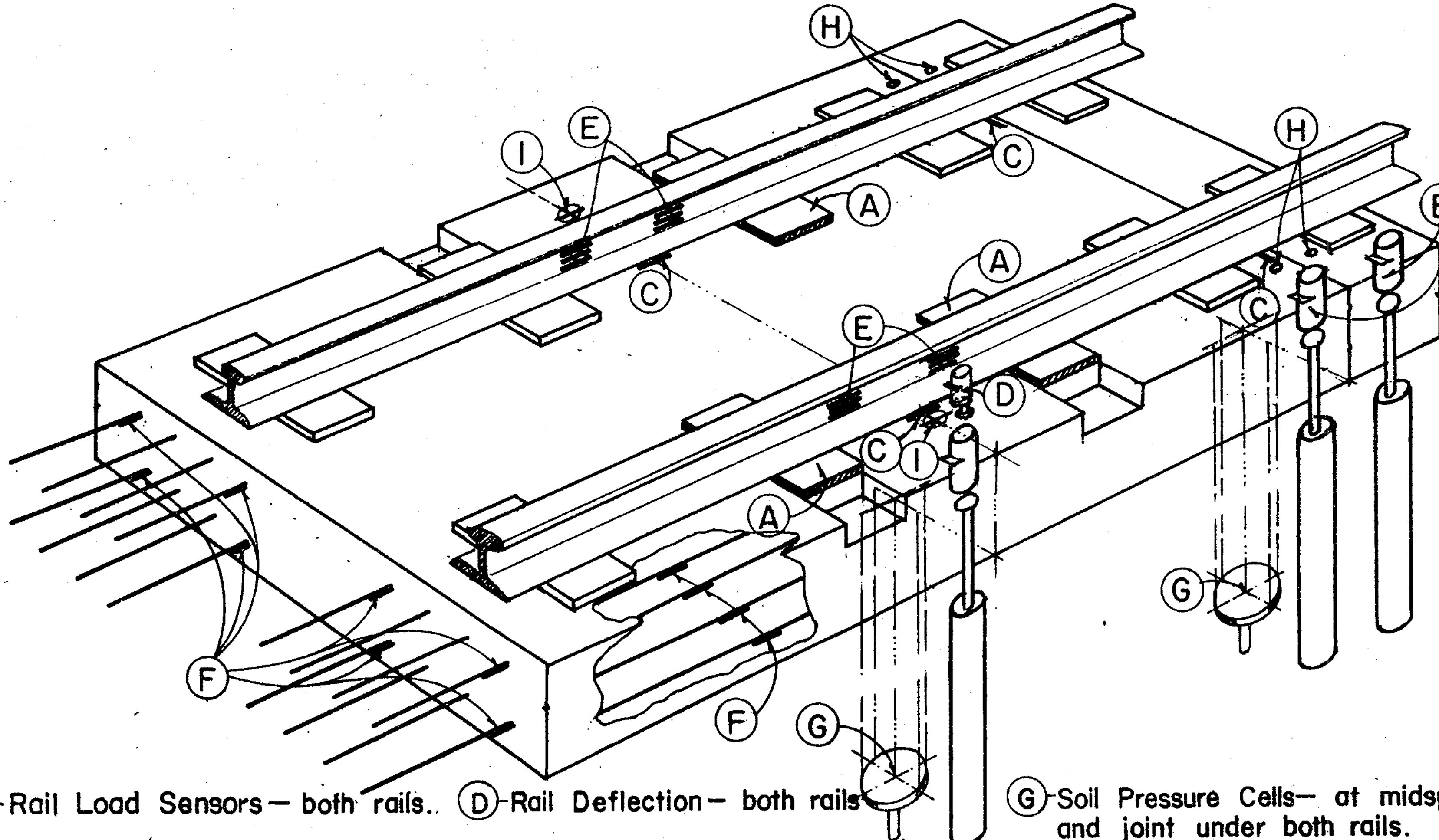
Ⓕ-Rebar Strain Gages—top and bottom bars at midspan and joint under both rails.

Ⓖ-Soil Pressure Cells— at midspan and joint under both rails.

Ⓗ-Joint Width Plugs— both sides of each beam.

Ⓘ-Settlement Targets — both sides of each beam.

FIGURE A11 - INSTRUMENTATION LAYOUT FOR SECTIONS 4 AND 7



Ⓐ-Rail Load Sensors — both rails.

Ⓑ-Slab Deflection Meters — both sides of joint and midspan.

Ⓒ-Concrete Strain Gages — top, mid and bottom at midspan — top and bottom at joints.

Ⓓ-Rail Deflection — both rails.

Ⓔ-Rail Strain Gages — top, mid and bottom at both sides of both rails.

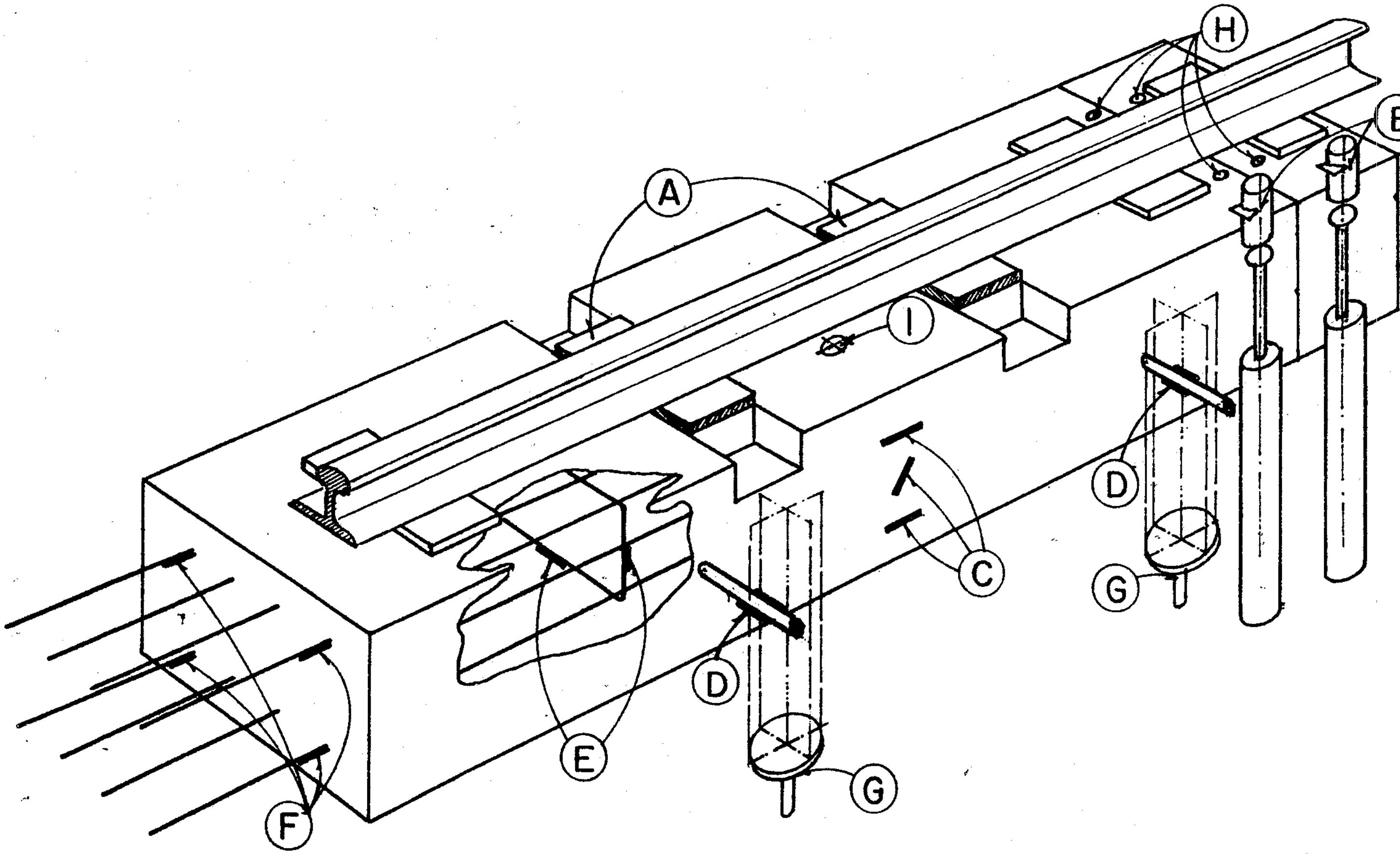
Ⓕ-Rebar Strain Gages — top and bottom bars at midspan and joint under both rails.

Ⓖ-Soil Pressure Cells — at midspan and joint under both rails.

Ⓗ-Joint Width Plugs — both sides of slab.

Ⓘ-Settlement Targets — both sides of slab.

FIGURE A12 - INSTRUMENTATION LAYOUT FOR SECTIONS 5 AND 5-1



Ⓐ Rail Load Sensors — both rails.

Ⓑ Beam Deflection Meters — both sides of joint.

Ⓒ Concrete Strain Gages — both sides of both beams.

Ⓓ Gage Bar Strain Gages.

Ⓔ Stirrup Strain Gages — midspan at two locations.

Ⓕ Rebar Strain Gages — top and bottom bars at midspan and joint under both rails.

Ⓖ Soil Pressure Cells — at midspan and joint under both rails.

Ⓗ Joint Width Plugs — both sides of each beam.

Ⓘ Settlement Targets — both sides of each beam.

FIGURE A13 - INSTRUMENTATION LAYOUT FOR SECTION 4-1

4-1, additional deflectometers were placed on the field side of the south beam, at both ends. Deflectometers were placed on both rails midway between the two intermediate fasteners.

Soil pressure cells were placed at the subgrade-ballast interface below both rails at the west joint and middistance between joints.

Rail strains were monitored mid-way between the two intermediate fasteners and directly over one of the intermediate fasteners. Strain gages were attached to both sides of the rail at the positions shown in Figure A5.

Strains in reinforcing bars were monitored at the west joint and at middistance between joints directly below both rails. At each location strain gages were placed on two top and two bottom longitudinal reinforcing bars. Duplicate strain gages were also placed at each location as backup, in case of malfunction of the primary gages. In Section 4-1, strain gages were placed on the top and bottom of four different stirrups. The instrumented stirrups were located at middistance between joints in the north and south beams, and 30 ft. west.

Concrete strains were monitored at middistance and west joint of the instrumented panel. The strain gages at midlength were placed longitudinally at the top, middle, and bottom of the concrete section directly below both rails, one inch from the joint. In Section 4-1, the concrete strain gages were placed at middistance between joints on both sides of both beams. The top and bottom gages were placed longitudinally one inch from the top and bottom surfaces of the concrete, respectively. The center gage was located at midlength of the beam at a 45° angle.

Gage bars used to hold the north and south beams at the proper spacing were instrumented at Section 4-1. Strain gages were placed on the opposite sides of the gage bars located 2.5 ft east and 32.5 ft west of the midlength of the instrumented beams.

Rail load sensors were placed, in recesses in the top surface of the concrete, under the two intermediate fasteners for each rail.

Design and Instrumentation of Load Cell Ties

A substitute tie was made for each of the six cross tie track sections to measure rail seat forces entering the tie and reaction forces on the base of the tie. The base of the tie was separated into 10 equal base pads. A special plate was provided on the top at each rail seat. Strain-gaged studs supported the two rail seat plates and the 10 base pads from the tie structure. The stiffness and the exterior dimensions of the tie structure were similar to the adjacent concrete or timber ties.

Stiffness Representation - Concrete Ties

Stiffness of three concrete ties was determined 43 days after manufacturing by bending the ties and measuring the deflections. Ties were supported upside down at the rail seats to form a 60-in. span. Load was applied on the bottom surface at two points 16 in. apart as shown in Figure A14. Center deflection was measured for loads up to 10 kips with a dial gage graduated in 0.001-in. increments.

Test results shown in Figure A14 indicate that a 1-in. midspan deflection occurred for a 220.69-kip load. Midpoint deflection is dependent on section dimensions and modulus of elasticity, E_c, of the concrete. Based on cross-sectional moment of inertia and moment diagram, shown in Figure A15, it was calculated that a 1-in. midspan deflection occurs for 0.0474 E_c-kip load. Therefore, the modulus of elasticity corresponding to these data is 4.65 million psi. The average modulus of elasticity of 4.32 million psi, measured on two companion test cylinders, agrees favorably with this value. The load cell ties were designed for a modulus of elasticity of 5 million psi. The increase was intended to accommodate the increase in modulus value with time. A load-deflection comparison for a 2-1/2-yr. old concrete tie and a load cell tie is shown in Figure A16.

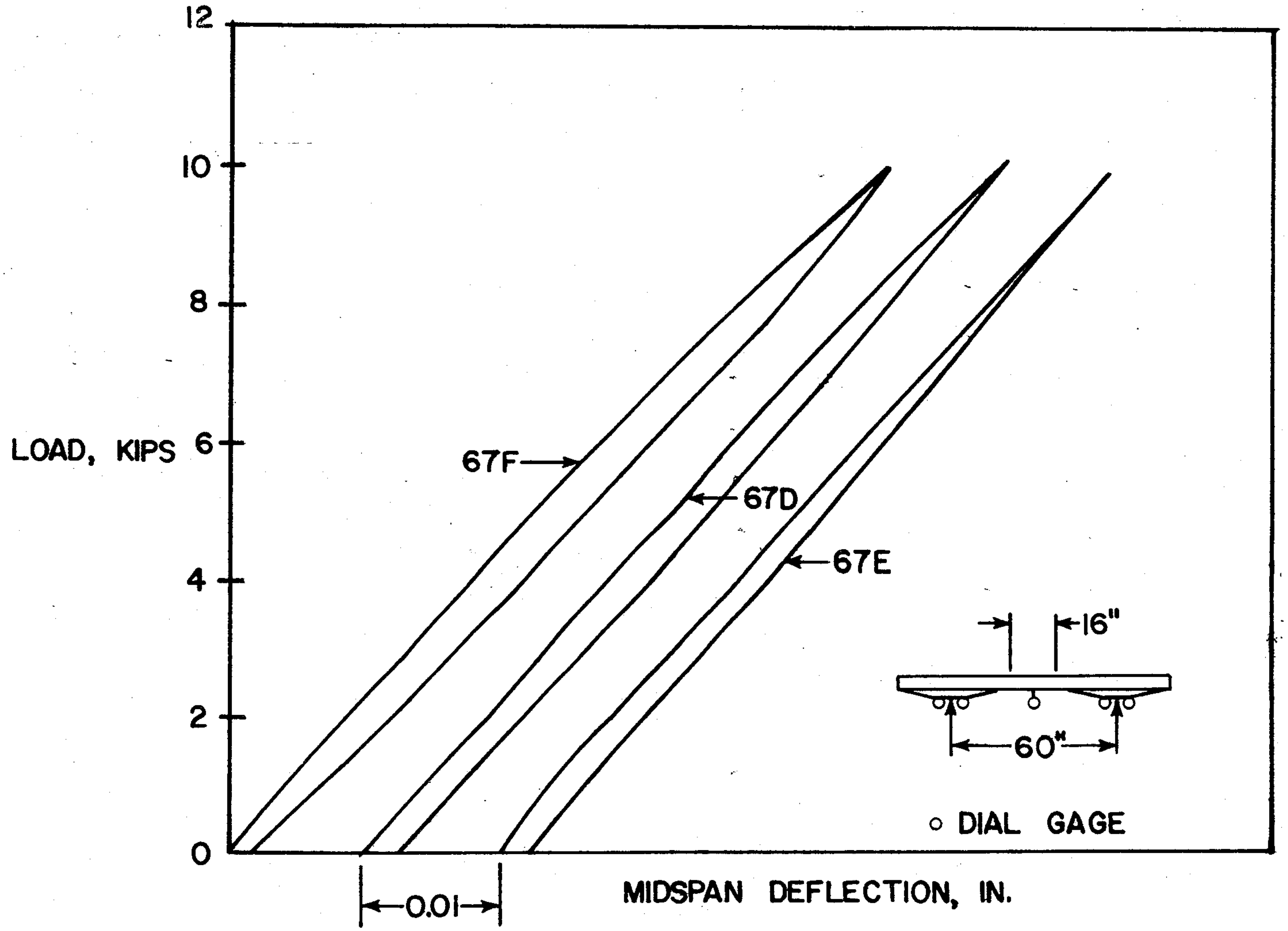


FIGURE A14 - LOAD VERSUS DEFLECTION FOR CONCRETE TIE

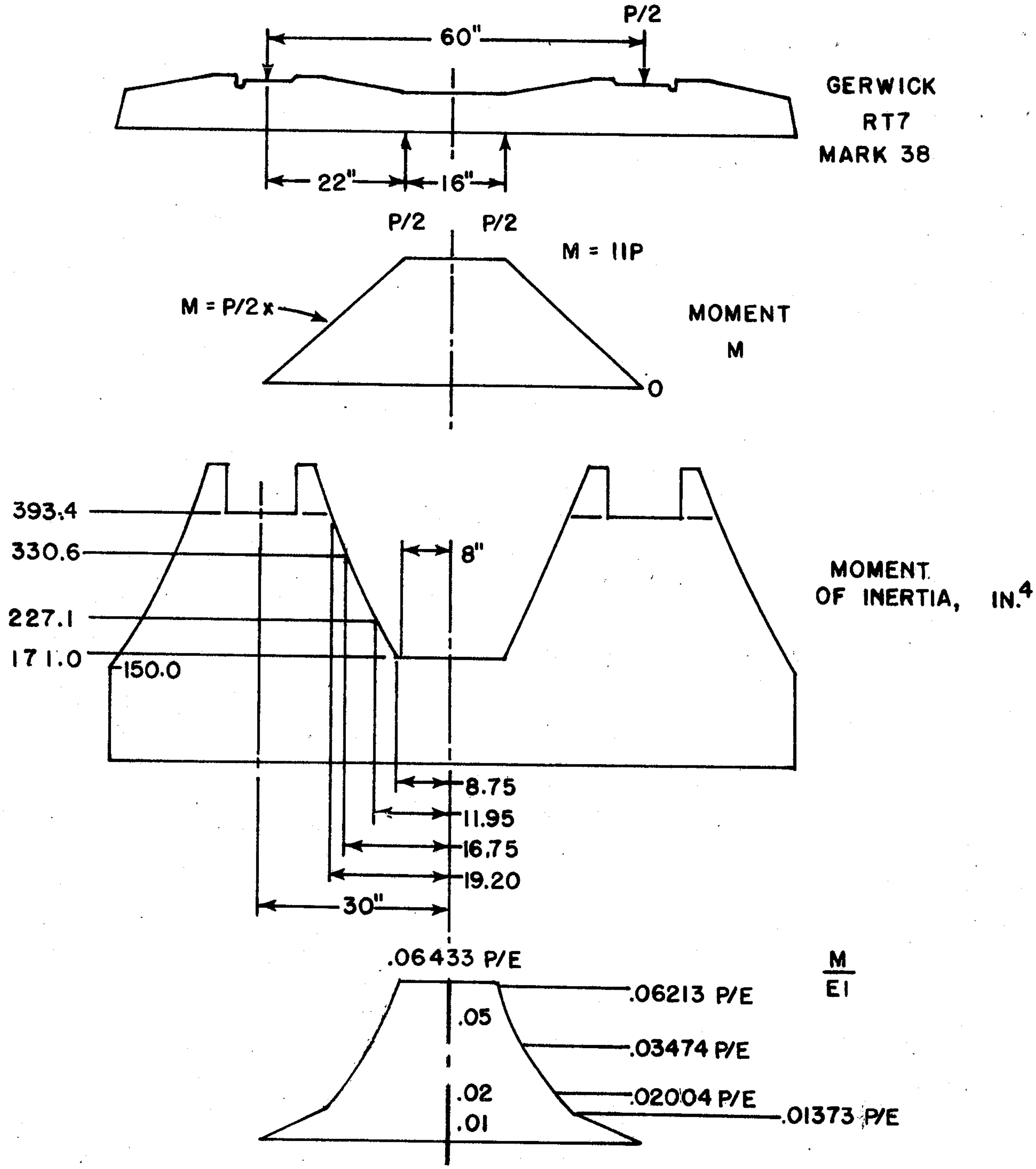


FIGURE A15 - CONCRETE TIE CALCULATIONS

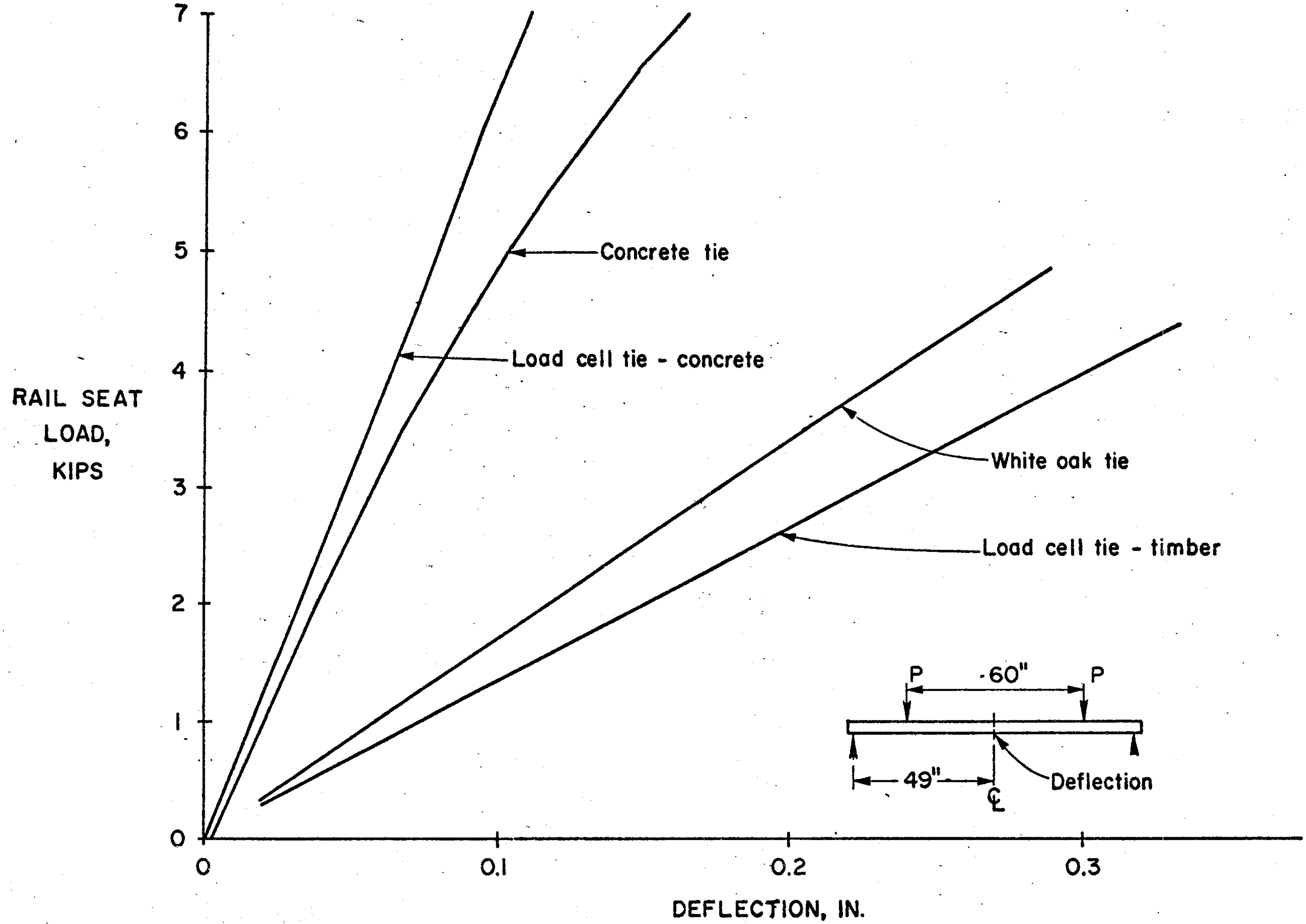


FIGURE A16 - STIFFNESS COMPARISON

Stiffness Representation - Timber Ties

Stiffness of three wood ties was determined by bending the ties and measuring the deflections. Tests were conducted in the same manner as for the concrete ties except that the maximum applied load was 5 kips. Test results are shown in Figure A17. These data indicate that for red oak ties a 1-in. midspan deflection occurred for 91.74 and 82.51 kip loads for a 7x8-1/2-in. and 7-1/8x8-1/4-in. tie, respectively. For the 7-1/2x8-in. white oak tie, a 1-in. midspan deflection occurred for a 82.51 kip load. Considering a uniform cross section and the applied bending moment diagram, the calculated midspan deflection was 0.0002461 EI. The modulus of elasticity corresponding to these data varies from 1.35 to 1.53 million psi for the red oak and is 1.39 million psi for the white oak. The design of the load cell tie was based on a modulus of elasticity of 1.33 million psi. A load-deflection comparison of the load cell tie and a white oak tie is shown in Figure A16.

Design of Basic Structure - Concrete Load Cell Tie

Design loading for the structure was chosen to be greater than that needed to cause cracking in the concrete ties used on the Kansas Test Track. Calculations indicate cracking at 227 in.-kip at the rail seat and 147.5 in.-kip at midlength. For a uniformly distributed tie-ballast pressure, these bending moments correspond to a load of 42.5 kips at each rail seat. A rail seat load of 50 kips was chosen for design. Design stress of 20 ksi in structure, 8 ksi tensile stress in welds, and 5 ksi shear stress in welds was used. Torsion of the structure was calculated assuming that the 50-kip rail seat load acts eccentric with an eccentricity equal to 1/6 of the tie-width. Therefore, the design torque was 91.8 in.-kips.

The interrelated requirements of stiffness and strength were met by using the 3-tube basic structure shown in Figure A18a. The midlength cross section extends the full length of the tie. The main channel (-1) and the two angles (-2) were

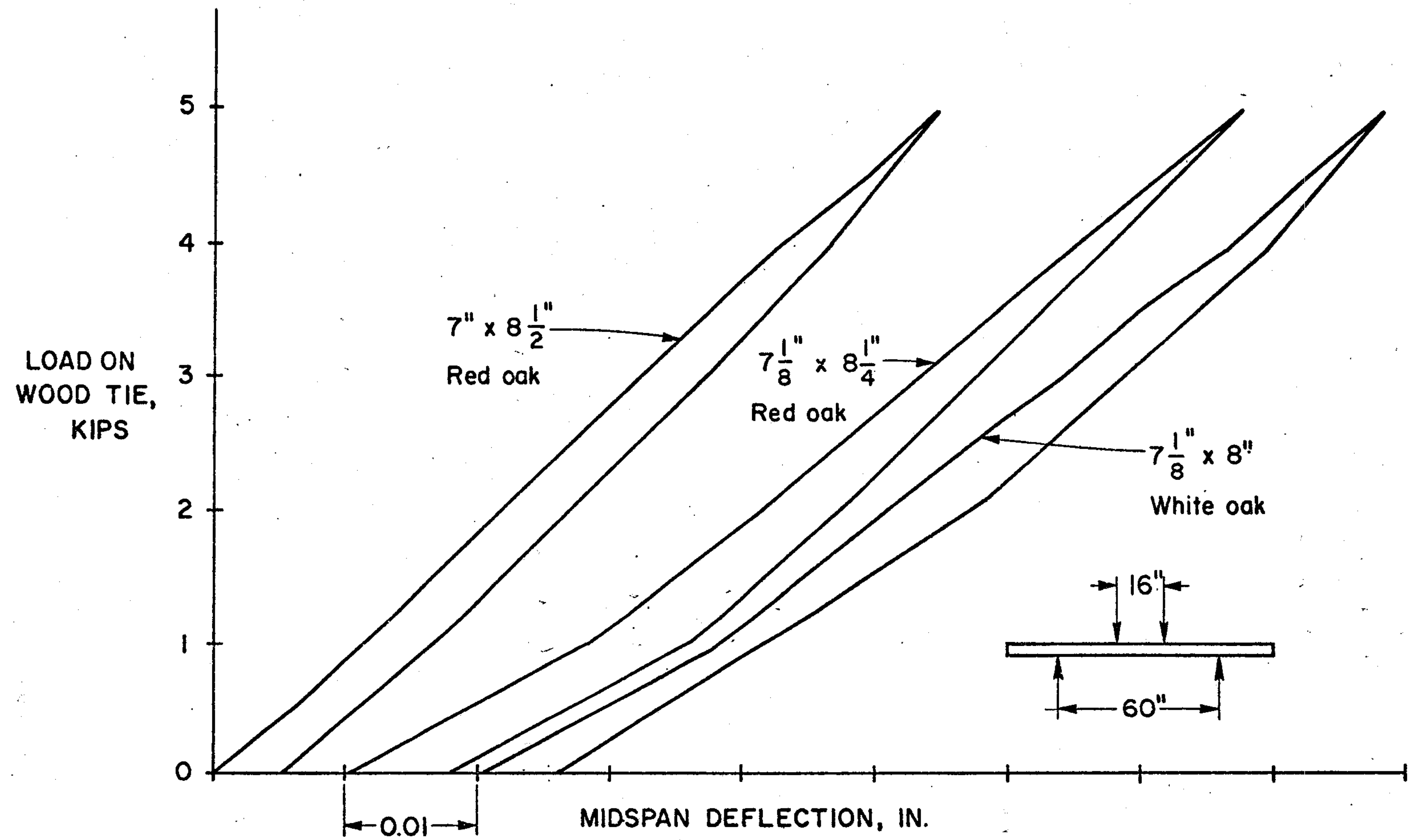
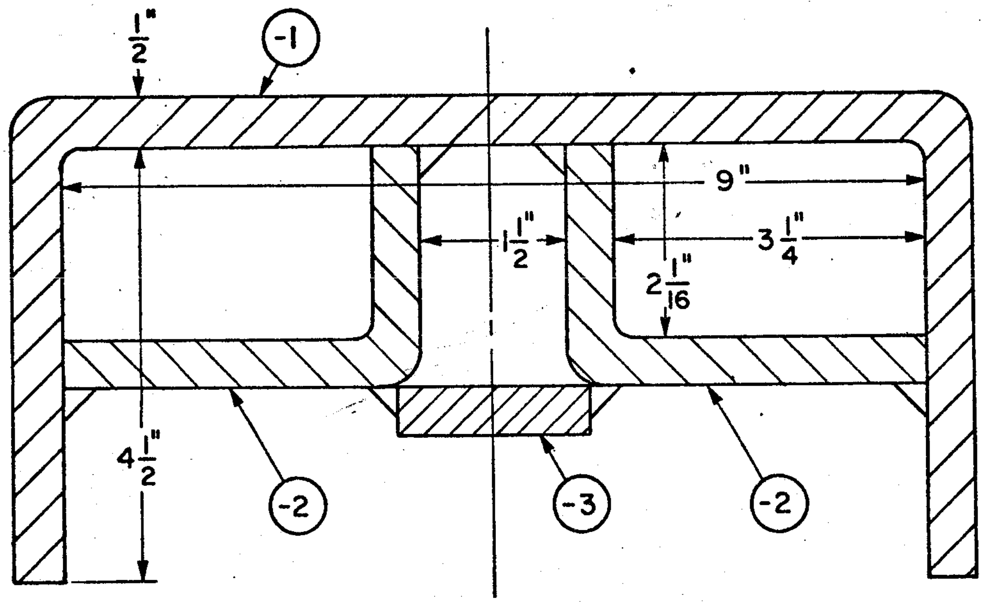
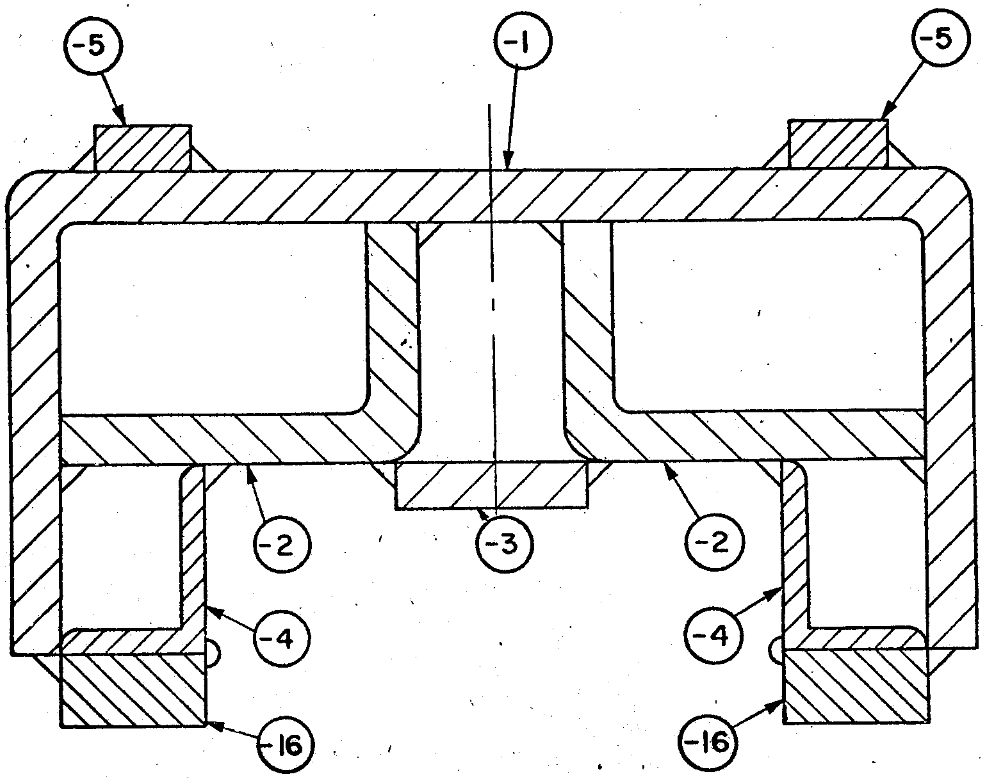


FIGURE A17 - WOOD TIE STIFFNESS



(a) Cross Section at Mid-length



(b) Cross Section at Rail Seat

FIGURE A18 - STRUCTURE OF CONCRETE LOAD CELL TIE formed from flat sheet steel. As shown in Figure A18b, stiffness was increased at the rail seat by adding two angles (-4), bottom plates (-16), and top plates (-5).

Design of Basic Structure - Timber Load Cell Tie

The loading chosen for design was that necessary to produce 1.5 times the normal design bending stress of 1,400 psi for oak timber. For a uniformly distributed tie-ballast pressure, this stress corresponds to a 27.5 kip load at each rail seat. The corresponding design moments are 147 in.-kip at the rail seat and 87.5 in.-kip at midlength. Based on the same assumption as for the concrete tie, a design torque of 36.7 in.-kips was calculated. Design stress of 1,400 psi was used.

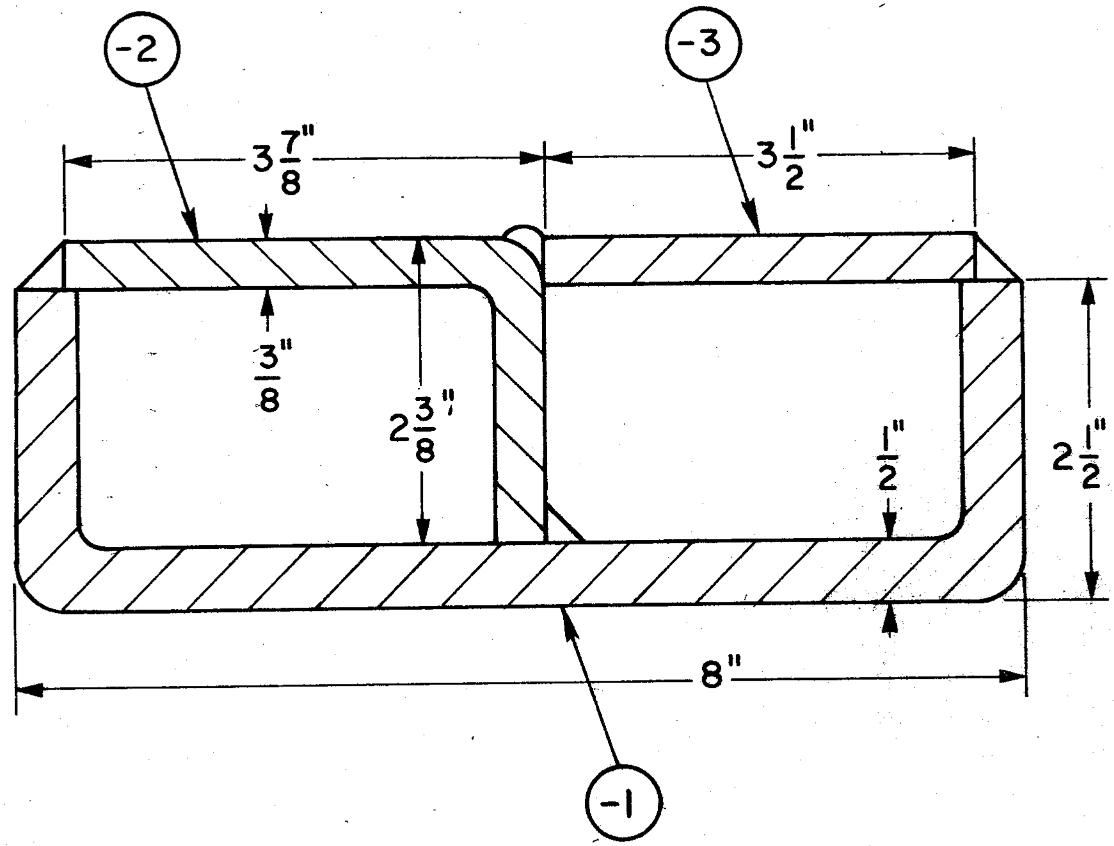
The 3-tube structure shown in Figure A19 was used for the entire length. The main channel (-1) and the angle (-2) were formed from flat sheet steel.

Assembly

The exterior height from the base of rail to bottom of the load cell tie was similar to that of the simulated tie. Also, the width and length of the bottom surface of both ties were similar. The exteriors of the ties are shown in Figures A20 and A21. At each rail seat there was a steel plate for rail attachment. Each rail seat plate was supported by 6 steel studs above the main structure. The bottom of each tie was covered by separate U-shaped base pads. Each base pad was supported by 4 steel studs below the main tie structure. The separation between base pads was covered with cloth tape as seen in Figure A21.

A cross section of the load cell simulating a concrete tie is shown in Figure A22. The rail seat plate (-12) was supported by studs (-15) from the structure (-2). The base pad, consisting of lower plate (-7) and side plates (-6), was supported by studs (-14) from the structure (-2).

A cross section of the complete timber tie is shown in Figure A23. The rail seat (-6) was supported by studs (-13) from the structure (-1). The base pad, consisting of lower



CROSS SECTION OF STRUCTURE - FULL LENGTH

FIGURE A19 - STRUCTURE OF TIMBER LOAD CELL TIE

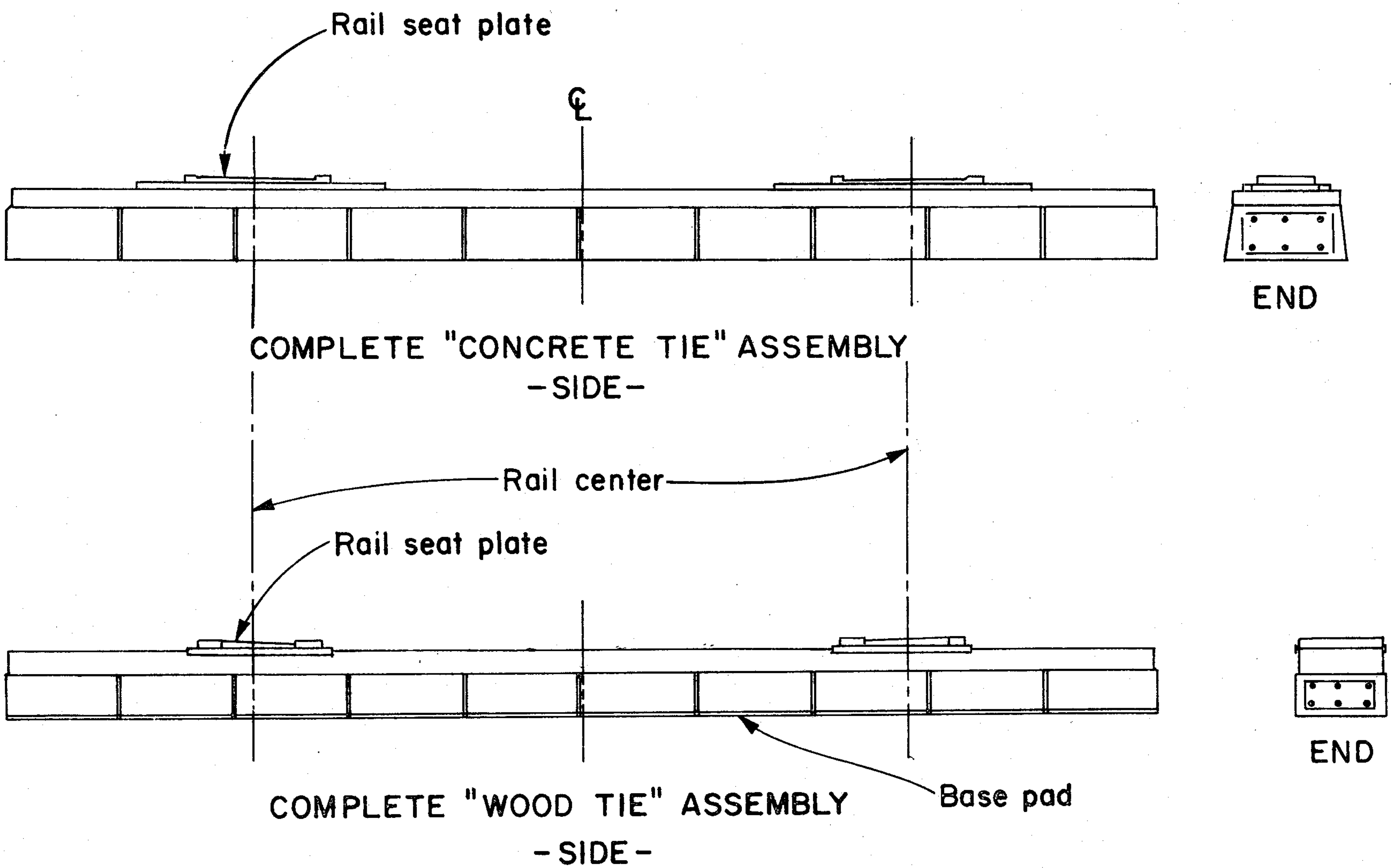


FIGURE A20 - TIE ASSEMBLY

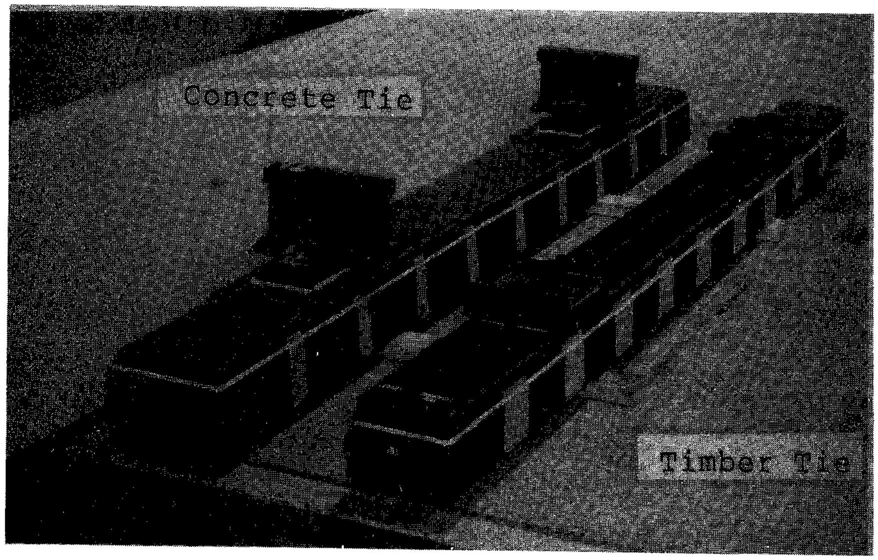


FIGURE A21 - LOAD CELL TIES

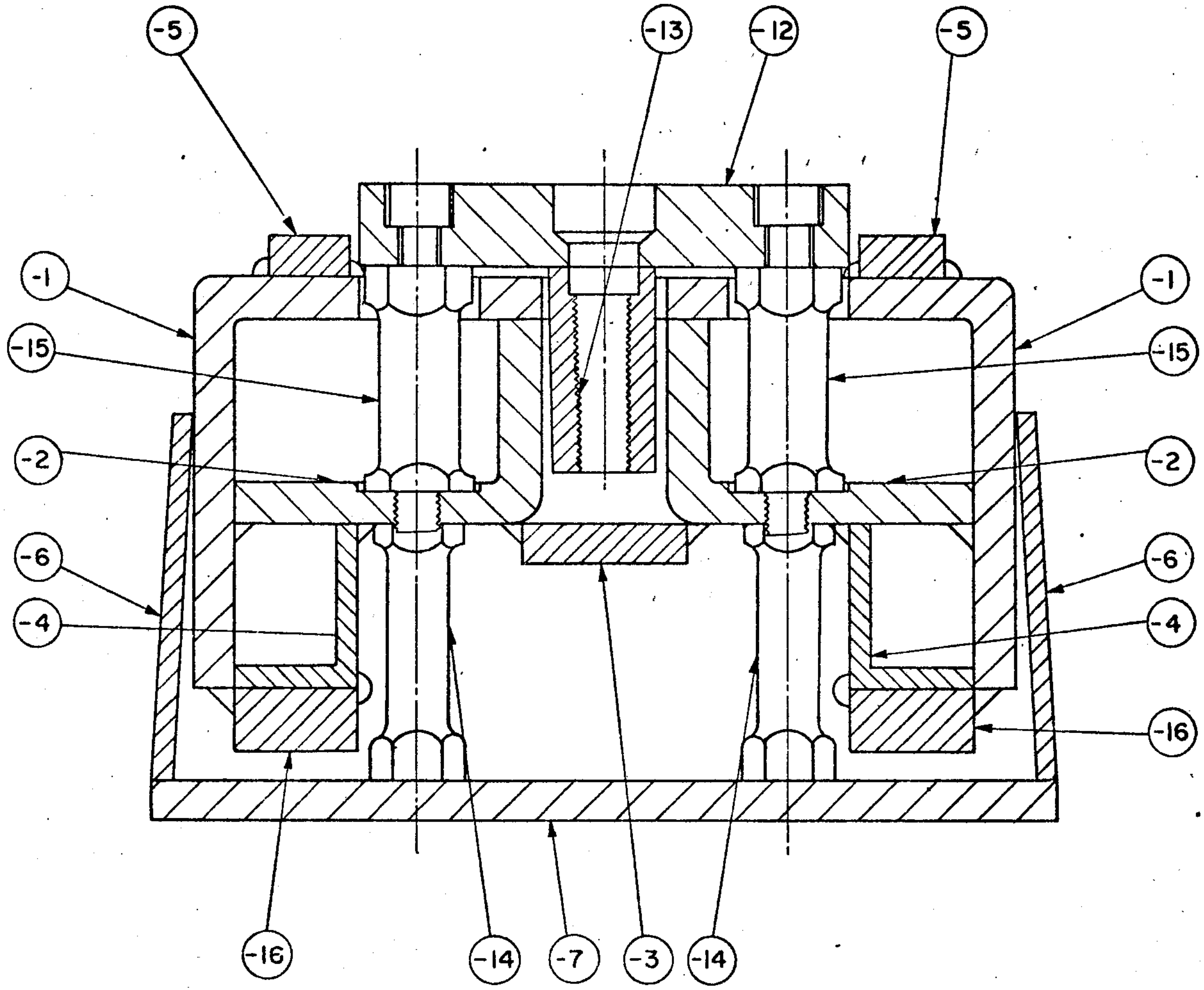


FIGURE A22 - CONCRETE TIE ASSEMBLY - CROSS SECTION AT RAIL SEAT ANCHOR BOLT

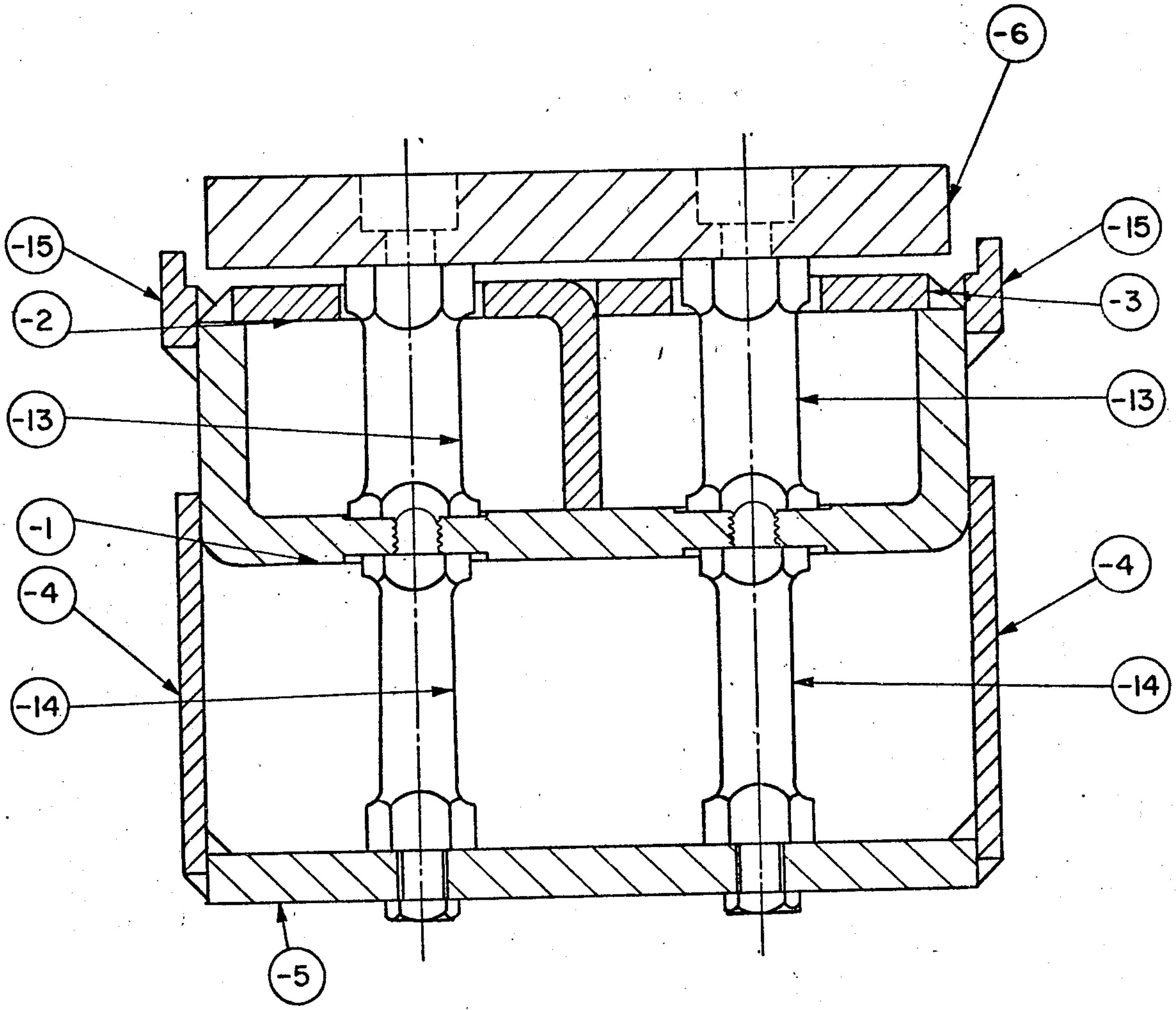


FIGURE A23 - WOOD TIE ASSEMBLY - CROSS SECTION
AT RAIL SEAT

plate (-5) and (-4) was supported by studs (-14) from the structure (-1). Upper side-plates (-15) were used at the rail seats to compensate for strength-loss where holes for studs (-13) passed through the structure.

The six support-studs under each rail seat had a 0.948-in. diameter. Design calculations included a 10-kip horizontal load applied at the rail head in addition to the vertical rail seat load. The four support-studs for each base pad had a 0.774-in. diameter. Each stud was threaded on one end to screw into the tie structure. A threaded hole at the other end of a stud accepted a machine bolt to it to a rail seat plate or base pad.

Instrumentation

Two axial and two transverse strain gages were cemented to each sensing stud. The axial gages were placed at 180° apart on a cross section midway between end disturbances. A transverse gage was cemented adjacent to each axial gage. Foil gages with a 2-mm gage length on phenol-epoxy backing were cemented using an epoxy.

Electrical wiring from individual studs were soldered to a terminal strip to form a complete strain-gage bridge sensitive to vertical load, for each base pad and rail seat. Shielded cable was used from the terminal strip to multipin connectors at one end of the tie. A removable cover plate in the end base pad provided access to the plug-in connectors.

Prior to final assembly and wiring of the studs, the stud groups were calibrated. The six rail-seat studs or the four base studs were screwed into a calibration plate and temporarily wired into a bridge for calibration. Strain was recorded as a test load was applied in increments to a maximum of 20 kips for base-pad cells, and 80 kips for rail-seat cells. Estimated calibration factors were approximately 20 and 50 lb per millionth strain for the base-pad cells and the rail-seat cells, respectively.

Electrical Insulation - Rail to Rail

The fastening system used in the concrete tie track provided electrical insulation at each rail. A rubber pad and insulated clips prevented short circuit between rails. The same insulation was provided in the load cell tie.

The fastening system used on timber tie track does not need insulation since timber is a nonconductor. The rail seat was designed to allow for a wrap-around insulation on the rail base at the load cell tie. This detail is shown in Figure A24. A 0.1-in. thick polyester and fiberglass insulation was cemented to a clean rail surface across the bottom and up around the base for 1-3/8 in. along the top surface. The total insulated rail length was 12 in. A 0.1-in. thick sheet steel was cemented on the outside of the insulator as a wearing surface. The rail seat plate was shaped to fit the insulated rail just as the adjacent tie plate fits a bare rail. A machined simulation of a rail spike allowed 3/8-in. vertical rail movement free of the tie.

Details of Rail Load Sensors

Rail load sensors, similar to those shown in Figure A25, were designed and built to monitor vertical and lateral rail loads. The sensors were installed in recesses between the fastener and concrete. The top and bottom plates were bolted to the fastener and concrete, respectively.

Sensors were designed so that the top plate, which was supported on two rockers, could bend and move laterally. Vertical loads were determined from the bending of the top plate and the lateral loads were determined by the lateral movement (or force applied to two load-cell spindles). Bending in the top plate was measured by strain gages bonded to the bottom surface of the plate.

Static and dynamic calibrations of the sensors were done initially in the laboratory. Upon installation of the sensors in track, difficulties were encountered, primarily due to the

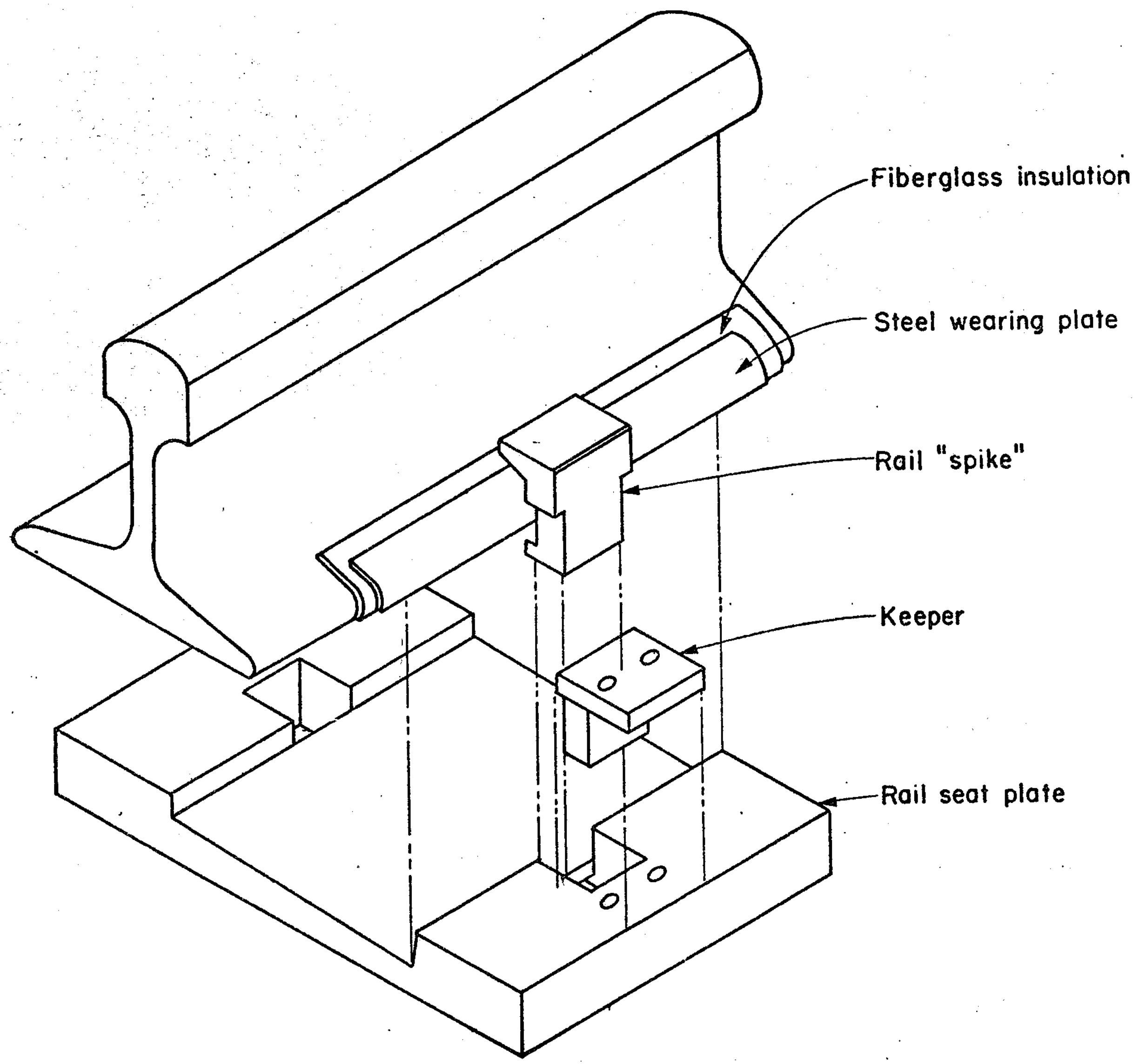


FIGURE A24 - INSULATED RAIL SEAT FOR
WOOD LOAD CELL TIE

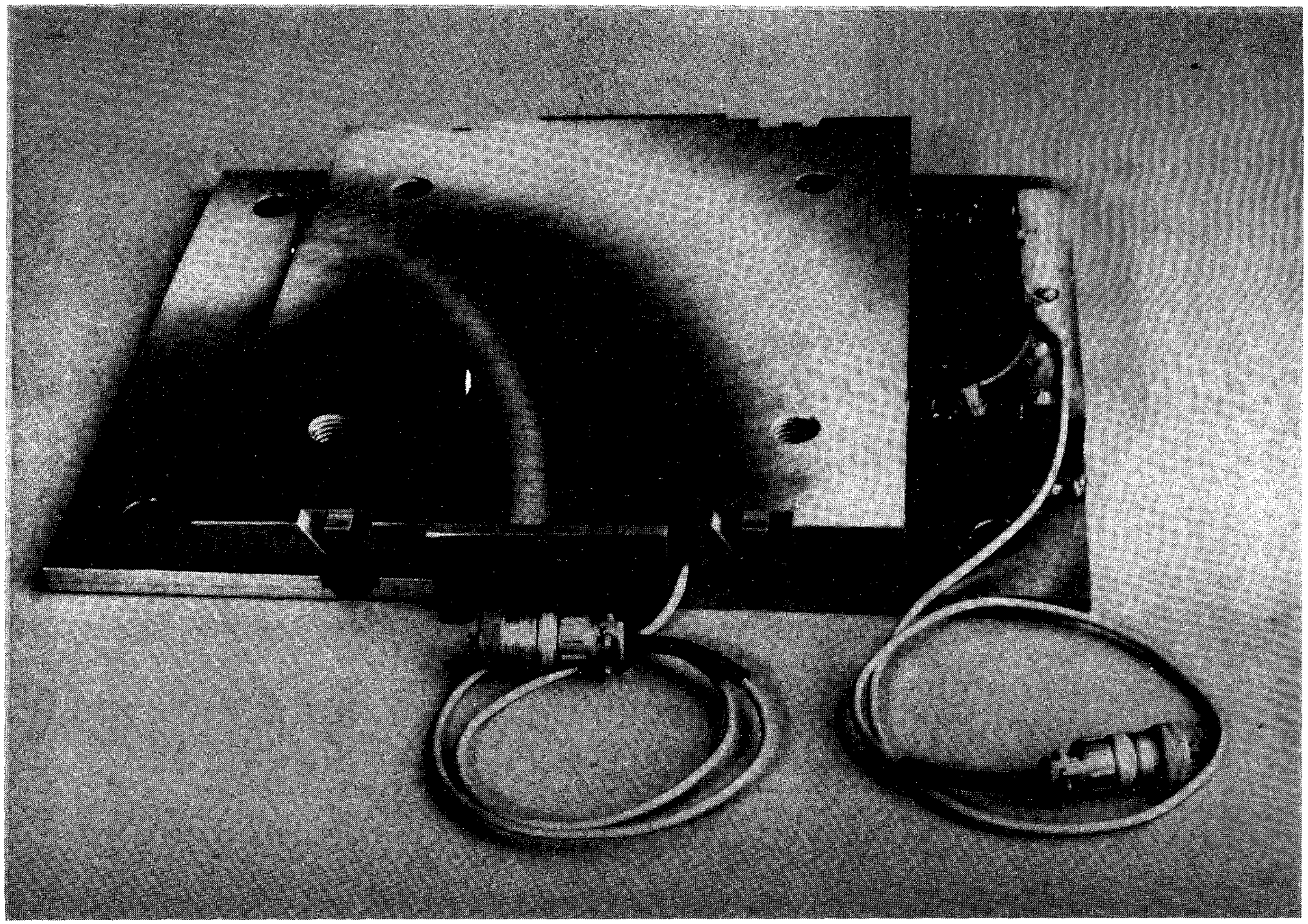


FIGURE A25 - RAIL LOAD SENSOR

field condition of the fasteners. Details of the problems are presented in Appendix F. In January and February 1975, additional laboratory tests were conducted to improve the method of installing and calibration. To improve the sensitivity and performance of the sensors, a shim was installed between the center of the top plate and the bottom of the fastener. Sensor-installation modifications and field calibration of each sensor at all locations greatly reduced many of the initial problems. During the April 1975 data-acquisition trip the vertical load sensors functioned properly, but the lateral load sensors did not provide worthwhile data. The project was terminated before any further work could be done on the sensors.

APPENDIX B

DATA REDUCTION METHODS AND SAMPLE DATA

A data trace was produced on each channel of each oscillographic recorder as a selected train passed over a selected test section. A copy of two such traces is shown in Figure B1. The recording paper was moving at a rate of 25 mm per second under the recording stylii. The stylii were at a rest or zero position before deflecting to 12 successive peaks due to three locomotives passing the test section. Then each wheel of the following cars indicated its effect by stylus movement.

Stylus movement was converted to engineering units of strain, force, pressure or displacement using the following equation:

$$EU = \frac{(A - B)CD}{E}$$

where EU = engineering units

A = stylus position at peak due to wheel, mm

B = stylus rest position, mm from edge

C = factor

D = range setting on oscillograph

E = Stylus displacement, mm, at calibration prior to train passage.

The factor, C, is predefined by gage factor for strain gage channels and by precalibration for other items. Methods used to define factors and to produce the calibration, E, are described in Appendix F. The upper trace in Figure B1 was recorded in Test 4, Section 2, Train 2, Channel 9 which is an interface pressure cell under midlength of the load cell tie. For the first wheel in this trace:

A = 35.2 mm from edge to peak,

B = 14.8 mm from edge of trace,

C = 0.448 psi per mm,

D = 20,

E = 10.3 mm,

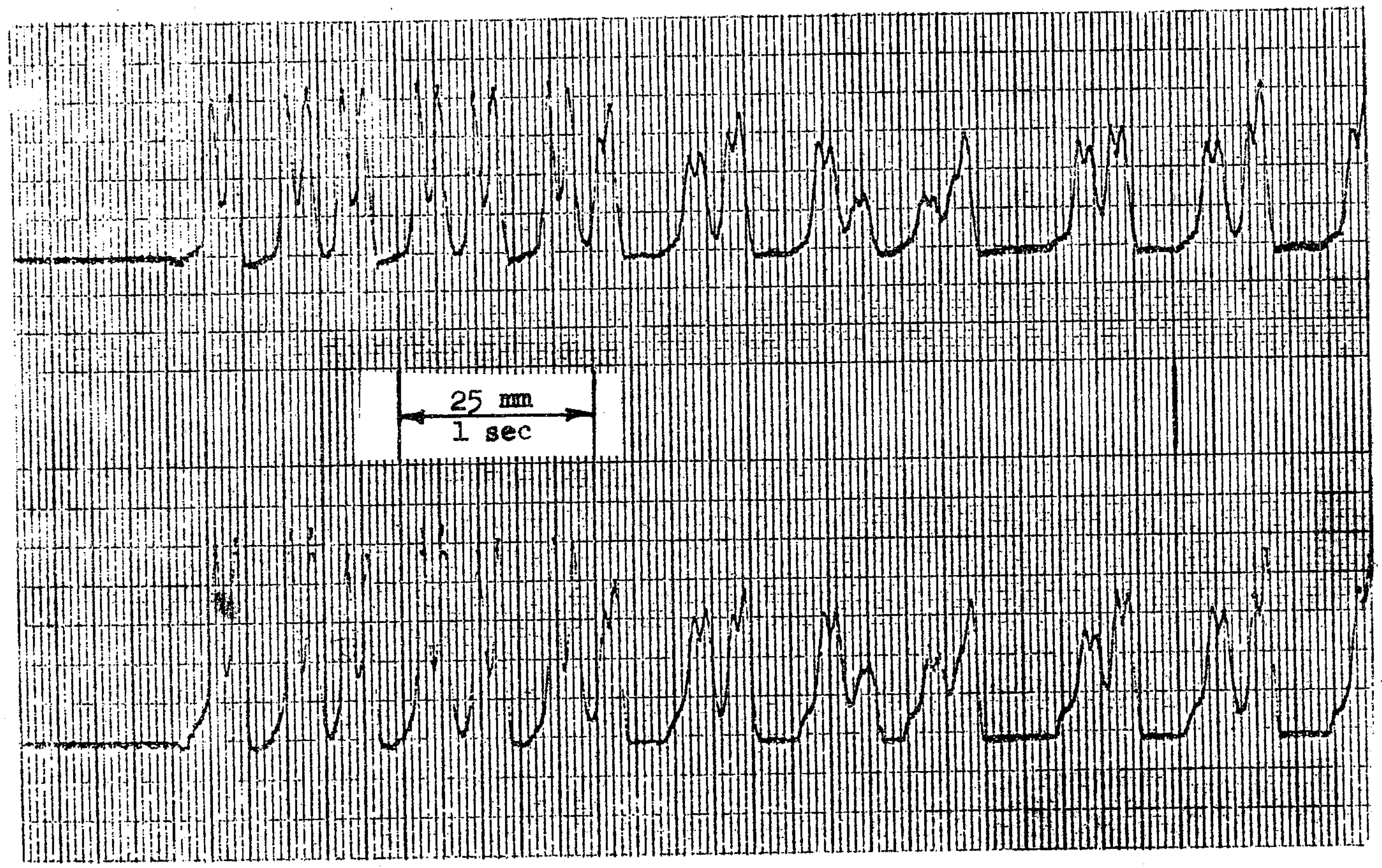


FIGURE B1 - SAMPLE DATA TRACES

Therefore,

$$EU(\text{interface pressure}) = \frac{(35.2 - 14.8)(0.448)20}{10.3} = 17.7 \text{ psi}$$

This result is shown in Table C8 of Appendix C as reduced data for wheel number one for the defined data line. The wheel load for the leading train axle was 33 kips as shown on the last line of Table C8.

Data was further summarized by dividing each result by the wheel load. The maximum, minimum, and average ratios were then used to describe a group of data.

For the sample data being considered, the ratio is 17.7 psi/33 kips or 0.536 psi per kip of wheel load. The average interface pressure for this item is 0.57 psi per kip as shown in Table 23 of the report.

Further reductions were done on rail and tie data. Rail strain data were used to calculate rail curvature due to wheel load and to calculate stress at the top of rail head.

$$S = \frac{T(U - L)}{N} E_s$$

where
- S = stress at top of rail head, psi
- T = distance of top surface to neutral axis, in.
- U = strain at upper gage (average)
- L = strain at lower gage (average)
- N = distance between upper and lower gage, in.
- E_s = modulus of elasticity of rail steel, psi

Tie strain data were used to calculate tie curvature and to calculate bending moment in the tie.

$$M = \frac{(U - L)}{N} (E_t\ I)$$

where
- M is bending moment, in.-lb
- $(E_t\ I)$ is stiffness of tie cross section, 16-in.^{2}

The stiffness used for timber tie calculations was 335 million lb-in.^{2} as described in Appendix A. Similarily, stiffness of concrete ties at midlength was 877 million and at the rail seat was 1,945 million lb-in.^{2}

Acceleration data was stored on magnetic tape at the original train passage. This data was reduced to power spectral density plots as described in Appendix E. Peak values calculated for a range of frequencies are shown in Tables 24 and 25 for rail and tie accelerations, respectively.

$$G = 1.414 \ F \times 10^{\frac{(FS - L)}{10}}$$

where G = acceleration amplitude in g's

F = frequency, Hz

FS = full-scale db relative to 1 g^2 rms/hz

L = db relative to full-scale

APPENDIX C

TIE TRACK DATA

Data reduced from oscillograph records are shown in Tables C1 to C24 for tie track Sections 1, 2, 3, 6, 8, and 9. The appropriate engineering units are listed in the data-description line. Each column records the effect of the locomotive wheel numbered at the top of the column. Data values of 0.0 indicate non-existent data. The wheel load is listed at the bottom of each column. For Tests 1 and 2, the same train was used for all sections. The wheel loads are as tabulated in Table C1.

For Tests 3 and 4, 2 or 3 trains were used to obtain the data. Wheel loads for all trains appear in the last lines of the tables. The TSRCH code number identifies the train used with each line. The TSRCH is a 5 digit number where the first digit indicates the test number, the second digit is the section number, the third digit is the run or train number, and the last two digits are the original channel number. Thus, if the 3rd digit is 2, the data line resulted from the wheels of the second train.

Data obtained from accelerometer tape recordings for tie track sections are shown in Figures C1 to C27. Figures show power spectral density of accelerations versus frequency as described in Appendix E, Accelerometer Data Reduction Procedure.

TABLE C1 - TEST DATA FOR TEST 1 ON SECTION 1

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	11218	-207.1	-197.1	-206.1	-202.1	-203.1	-183.9	-200.1	-148.3	-156.3	-164.2	-203.1	-160.2
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	11226	30.2	37.2	4.6	30.2	6.9	23.3	0.0	27.9	27.9	23.3	6.9	20.9
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	11227	42.3	39.2	42.0	39.5	37.5	36.1	37.8	33.2	35.8	36.9	38.0	34.6
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	11228	28.0	31.0	31.0	31.6	23.2	21.4	25.0	19.0	18.4	20.8	23.8	23.2
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	11229	10.0	11.3	9.4	8.0	9.4	8.0	6.6	9.4	9.7	8.8	11.1	11.1
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	11222	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	11236	-33.8	-30.0	-33.1	-32.1	-30.0	-27.2	-31.7	-23.0	-23.0	-24.4	-30.7	-24.7
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	11237	21.2	23.3	21.0	22.2	22.2	25.0	21.2	25.8	26.6	26.3	20.7	23.8
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	11225	223.6	210.8	215.5	208.5	194.5	191.0	192.2	167.7	180.5	193.3	201.5	182.9
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	11201	-78.3	-80.5	-63.1	-54.4	-34.8	-69.6	-52.2	-13.0	-26.1	-78.3	-43.5	-50.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	11202	62.9	60.5	62.9	65.2	60.5	41.9	44.2	62.9	51.2	37.2	55.9	48.9
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	11203	137.0	157.6	125.6	127.9	93.6	130.2	100.5	73.0	59.3	125.6	102.7	102.7
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	11233	-9.5	-10.0	-8.9	-10.0	-9.7	-11.4	-8.9	-9.7	-9.7	-10.3	-8.9	-9.7
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	11234	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	11235	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	11231	25.5	27.0	29.5	25.5	24.9	27.0	27.0	24.9	24.9	26.2	24.7	26.2
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	11232	-21.3	-22.7	-19.9	-20.9	-19.2	-20.2	-20.2	-19.9	-20.6	-21.3	-19.9	-19.5
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	11204	-87.9	-98.9	-76.9	-54.9	-76.9	-87.9	-65.9	-54.9	-54.9	-87.9	-65.9	-65.9
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	11205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	11206	84.3	86.5	86.5	79.9	86.5	102.1	89.7	84.3	82.1	102.1	95.4	93.2
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	11207	16.0	13.7	14.8	11.4	10.2	12.5	11.4	10.2	10.2	11.4	11.4	10.2
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	11208	-16.4	-16.4	-14.2	-14.2	-13.1	-14.2	-13.1	-12.0	-10.9	-14.2	-14.2	-13.1
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	11124	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	11125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	11209	44.9	47.4	46.4	47.2	49.1	50.5	46.4	46.4	49.7	50.1	47.0	48.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	11210	19.5	21.1	20.1	21.7	21.0	22.8	19.1	20.8	21.7	22.5	21.0	22.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	11211	31.5	34.7	32.9	33.8	32.4	34.8	32.7	34.5	34.7	35.9	32.9	35.2
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	11212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	11213	15.8	17.0	16.8	16.6	18.0	18.3	16.0	16.8	17.5	18.1	17.0	17.5
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	11214	30.6	32.4	30.6	32.1	32.2	32.8	31.0	31.7	32.2	32.9	31.6	33.4
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	11215	1.7	1.8	1.7	1.8	1.9	2.0	1.8	1.9	2.2	2.1	1.9	2.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	11216	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	11217	7.3	8.8	7.5	8.7	8.2	10.0	8.4	9.6	10.1	10.7	6.4	7.6
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	11127	14.3	16.2	14.1	14.6	15.6	16.7	13.6	15.1	15.7	16.2	14.7	14.7
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	11128	16.9	18.5	14.4	16.3	15.6	16.4	15.6	15.0	15.9	17.5	14.7	17.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	11129	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	11130	2.5	2.8	2.7	2.6	2.9	2.9	2.7	2.7	2.9	2.9	2.7	2.7
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	11131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	11132	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	11133	1.9	2.1	1.8	2.0	2.0	2.2	1.8	2.0	2.1	2.2	2.0	2.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	11134	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	11135	4.3	4.7	4.2	4.6	4.7	4.8	4.4	4.4	4.6	4.9	4.4	4.7
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	11136	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	11137	2.7	3.1	2.8	3.2	2.9	3.1	2.9	2.9	2.9	3.3	2.8	3.4
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	11138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TRAIN DATA -WHEEL LOAD -KIPS		35.10	35.10	34.60	34.60	31.10	31.10	29.92	29.92	30.65	30.65	29.85	29.85

TABLE C2 - TEST DATA FOR TEST 2 ON SECTION 1

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	21218	-215.0	-205.1	-201.1	-194.1	-185.2	-179.2	-181.2	-155.3	-163.2	-175.2	-189.1	-149.3
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	21226	20.9	20.9	-13.9	16.3	0.0	4.6	-11.6	20.9	9.3	4.6	0.0	4.6
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	21227	39.5	38.9	39.2	38.9	33.8	33.8	33.5	31.8	33.5	36.1	36.1	32.9
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	21228	33.9	39.9	34.5	41.1	22.6	27.4	41.1	23.8	39.9	24.4	33.9	39.3
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	21229	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	21222	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	21236	-34.9	-34.9	-31.7	-33.8	-33.5	-28.2	-28.2	-23.0	-24.4	-27.9	-31.4	-26.1
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	21237	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	21225	229.5	216.6	214.3	208.5	191.0	195.7	182.9	171.2	179.4	196.8	194.5	179.4
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	21201	-65.3	-89.2	-80.5	-65.3	-37.0	-67.5	-34.8	-10.8	-21.7	-65.3	-15.2	-32.6
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	21202	-34.9	-48.9	-37.2	-51.2	-34.9	-51.2	-32.6	-9.3	-20.9	-37.2	-27.9	-32.6
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	21203	119.7	141.6	102.7	116.4	54.8	118.7	84.5	52.5	50.2	116.4	93.6	89.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	21233	-9.2	-9.7	-8.1	-9.4	-9.2	-13.9	-6.1	-8.3	-12.8	-10.8	-9.2	-9.2
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	21234	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	21235	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	21231	27.2	28.7	31.5	26.9	26.5	31.7	31.2	27.7	36.5	30.2	29.0	34.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	21232	-19.9	-19.5	-21.3	-21.3	-19.5	-20.2	-19.5	-21.3	-26.5	-26.5	-16.7	-16.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	21204	-54.9	-87.9	-65.9	-65.9	-87.9	-87.9	-43.9	-87.9	-87.9	-87.9	-76.9	-65.9
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	21205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	21206	93.2	99.8	68.8	71.0	91.0	122.0	75.4	93.2	93.2	104.3	91.0	95.4
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	21207	18.2	17.1	18.2	10.2	8.0	13.7	11.4	9.1	9.1	11.4	11.4	8.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	21208	-14.2	-14.2	-14.2	-15.3	-13.1	-14.2	-13.1	-12.0	-13.1	-14.2	-14.2	-15.3
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	21124	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	21125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	21209	54.5	57.2	54.0	56.5	55.6	61.1	52.2	54.7	56.3	61.8	55.6	54.9
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	21210	18.6	19.8	17.6	19.0	18.3	22.0	18.0	19.7	19.8	22.7	18.3	21.2
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	21211	11.5	12.5	11.9	12.5	11.9	14.0	12.7	13.6	15.2	13.6	13.9	14.6
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	21212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	21213	15.6	17.7	16.3	17.4	18.2	18.6	16.2	18.2	19.2	19.4	17.2	18.2
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	21214	24.2	27.2	24.2	27.5	26.4	26.6	26.8	28.9	28.7	27.7	27.2	29.5
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	21215	0.4	0.6	0.5	0.6	0.6	0.7	0.4	0.5	0.8	0.8	0.5	0.5
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	21216	2.2	2.6	2.9	2.6	2.5	2.9	2.4	2.6	2.6	2.5	2.6	2.9
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	21217	5.9	8.4	6.9	8.0	7.7	9.4	8.0	8.5	8.5	9.4	8.1	10.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	21127	16.2	15.7	15.1	16.2	19.5	20.3	14.6	16.5	18.2	18.5	15.2	16.9
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	21128	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	21129	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	21130	2.8	2.6	2.5	2.7	3.3	3.3	2.4	2.5	3.1	3.1	2.7	3.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	21131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	21132	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	21133	1.9	2.0	1.8	2.0	2.3	2.6	1.8	2.1	2.6	2.3	2.2	2.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	21134	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	21135	3.1	3.2	3.0	3.2	3.3	3.4	3.2	3.4	3.2	3.5	3.1	3.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	21136	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	21137	3.0	3.3	2.9	3.1	2.9	3.1	3.5	3.4	3.3	3.1	3.5	3.7
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	21138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TRAIN DATA -WHEEL LOAD -KIPS		35.18	35.18	34.60	34.60	31.18	31.18	29.92	29.92	30.65	30.65	29.85	29.85

TABLE C3 - TEST DATA FOR TEST 3 ON SECTION 1

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	31101	-110.6	-108.3	-125.8	-113.0	-122.3	-110.6	-131.6	-135.9	-136.3	-191.3	-137.4	-109.5	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	31102	32.0	34.4	28.5	32.0	28.5	28.9	22.5	32.0	21.3	28.5	26.1	24.9	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	31103	208.7	211.0	197.2	218.0	194.9	205.0	200.7	226.0	208.7	197.2	209.7	198.3	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	31104	-107.3	-113.0	-103.9	-105.3	-109.5	-103.9	-102.7	-116.5	-109.6	-102.7	-119.9	-102.7	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	31105	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	31106	159.3	203.5	189.5	206.7	190.7	205.5	187.3	198.7	178.1	181.6	198.7	181.6	0.0	0.0	0.0	5.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	31107	-140.4	-131.3	-138.2	-142.7	-137.8	-137.0	-145.9	-141.6	-131.3	-151.9	-146.1	-148.4	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	31108	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	31109	182.9	175.9	196.8	174.7	170.9	160.9	184.0	180.5	170.0	167.7	174.7	167.7	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	31110	-71.0	-92.0	-86.2	-47.3	-64.0	-82.7	-92.0	-92.0	-101.3	-92.0	-81.5	-101.3	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	31111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	31112	163.3	156.4	147.3	146.1	141.6	139.3	173.6	145.0	153.0	155.3	147.3	138.2	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	31113	-36.2	-45.2	-36.2	-45.2	-33.9	-41.8	-36.2	-48.6	-43.0	-45.2	-39.6	-38.4	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	31114	8.7	8.7	10.9	6.5	8.7	6.5	8.7	6.5	10.9	10.9	8.7	6.5	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	31115	29.7	41.7	29.7	41.7	35.7	38.7	32.7	44.6	41.7	44.6	44.6	44.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	31116	53.7	51.5	53.7	51.5	51.5	51.5	53.7	56.0	49.3	51.5	51.5	53.7	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	31117	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	31118	-76.9	-81.5	-76.9	-86.0	-76.9	-76.9	-74.7	-83.7	-65.6	-63.3	-70.1	-65.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	31119	4.4	4.4	4.5	6.7	2.2	11.2	2.2	6.7	6.7	11.2	11.2	15.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	31120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	31121	67.9	70.0	72.2	72.2	71.1	68.9	63.9	71.1	72.2	70.0	68.9	68.9	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	31122	-13.8	-18.4	-17.3	-17.3	-16.1	-17.3	-15.0	-19.6	-16.1	-17.3	-13.8	-18.4	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	31209	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9	0.1	0.1	0.1	0.1
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	31210	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	31211	17.3	20.3	20.4	17.6	22.7	17.6	20.0	20.0	21.2	21.0	20.8	21.0	20.0	20.9	21.1	19.7	20.6	18.3
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	31212	14.0	17.4	15.9	15.8	18.0	14.9	16.6	15.6	16.5	17.9	16.5	16.6	16.3	17.0	17.1	16.2	17.6	15.4
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	31213	14.6	17.0	14.8	15.2	16.7	14.7	16.5	14.0	14.8	17.3	14.6	15.0	14.9	14.3	15.4	15.1	16.6	14.8
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	31214	20.2	24.4	25.1	21.1	26.6	22.0	24.3	23.5	24.5	24.3	24.7	25.5	25.5	24.3	25.9	22.7	24.5	23.5
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	31215	6.5	9.5	9.6	7.1	11.2	8.0	9.1	8.4	9.0	9.0	9.5	9.5	8.7	9.4	10.8	7.7	9.9	6.9
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	31216	11.1	13.7	13.5	12.6	14.9	12.6	12.9	11.7	12.9	13.0	13.0	13.3	12.0	13.0	13.5	11.9	14.6	13.0
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	31217	7.3	9.1	9.5	8.8	10.1	8.3	8.7	9.0	9.7	8.9	9.8	9.7	9.0	9.5	9.6	8.2	9.2	8.6
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	31218	5.4	7.5	7.3	6.1	8.2	7.0	6.8	7.2	7.7	7.0	7.8	7.5	6.7	7.9	8.8	6.9	8.2	7.2
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	31219	8.0	10.4	9.2	9.8	10.8	9.1	9.7	9.0	9.1	9.8	9.4	9.6	9.8	10.5	10.9	9.0	10.9	9.6
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	31127	17.9	19.7	17.2	20.2	18.5	19.5	17.8	20.6	18.5	19.7	17.8	18.5	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	31128	22.2	24.8	21.5	24.9	21.4	24.3	22.4	24.5	20.5	22.9	21.4	22.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	31129	3.9	4.1	3.8	4.2	4.0	4.3	3.9	4.3	4.0	4.4	3.9	4.0	0.0	0.0	0.0	0.0	0.0	5.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	31130	4.8	5.0	4.6	5.0	4.6	5.1	4.7	5.2	4.8	5.1	4.7	4.7	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	31131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	31132	2.8	3.3	2.7	3.4	2.7	3.2	2.9	3.5	3.0	3.2	3.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	31133	1.3	1.6	1.2	1.6	1.1	1.5	1.2	1.6	1.3	1.4	1.2	1.3	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	31134	1.5	1.9	1.4	1.9	1.3	1.8	1.5	1.9	1.6	1.8	1.6	1.7	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	31135	3.2	3.9	3.1	4.0	3.1	3.8	3.4	3.8	3.3	3.5	3.3	3.5	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	31136	3.6	4.2	3.2	4.3	3.3	4.1	3.7	4.1	3.6	3.7	3.4	3.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	31137	5.1	5.7	6.2	5.8	5.4	5.5	5.2	5.6	5.0	5.2	5.3	5.3	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	31138	3.1	3.7	3.0	3.7	3.3	3.7	3.4	3.6	3.0	3.4	3.2	3.4	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	31227	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	31228	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	31229	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	31238	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	31231	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	31232	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	31233	1.1	1.5	1.5	1.1	1.7	1.3	1.3	1.3	1.4	1.3	1.4	1.4	1.3	1.4	1.4	1.2	1.4	1.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	31234	1.3	1.8	1.8	1.3	2.0	1.6	1.6	1.6	1.6	1.6	1.7	1.6	1.5	1.7	1.7	1.5	1.8	1.6
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	31235	2.9	3.6	3.4	3.1	3.7	3.1	3.4	3.1	3.2	3.4	3.4	3.4	3.2	3.5	3.4	3.1	3.6	3.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	31236	3.5	4.0	3.7	3.6	4.2	3.5	3.8	3.4	3.5	3.9	3.7	3.8	3.5	3.9	3.7	3.6	4.1	3.6
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	31237	5.1	5.6	5.6	5.3	6.0	5.4	5.5	5.2	5.4	5.5	5.3	5.4	5.1	5.5	5.4	5.3	5.8	5.5
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	31238	2.8	3.5	3.3	3.2	4.6	3.5	3.2	3.2	3.4	3.2	3.2	3.2	3.0	3.5	3.3	3.2	3.7	3.4
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 1 -KIPS		33.40	33.40	32.85	32.85	33.40	33.40	32.85	32.85	33.40	33.40	32.85	32.85						
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 2 -KIPS		32.70	32.70	32.70	32.55	32.55	32.55	32.70	32.70	32.70	32.55	32.55	32.55	32.70	32.70	32.70	32.55	32.55	32.55

TABLE C4 - TEST DATA FOR TEST 4 ON SECTION 1

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	41101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	41102	35.4	42.6	39.3	38.7	39.3	42.1	40.4	41.5	37.6	36.5	33.8	41.5	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	41103	207.2	216.7	209.0	206.6	192.4	201.9	197.7	194.7	209.0	199.5	198.3	222.7	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	41104	-100.8	-91.1	-103.1	-115.1	-115.1	-115.1	-124.8	-105.6	-129.6	-121.1	-139.2	-110.4	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	41105	40.3	53.4	41.5	46.3	39.1	35.6	31.4	45.1	15.4	33.2	40.9	40.3	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	41106	166.9	172.4	172.9	177.5	171.3	178.4	177.3	185.0	168.0	161.4	167.4	183.3	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	41107	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	41108	10.0	14.6	10.6	15.4	15.4	10.6	10.0	13.6	12.4	10.6	-19.5	9.5	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	41109	204.5	218.6	190.4	204.5	183.4	184.5	169.3	171.6	218.6	198.7	229.2	229.2	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	41118	-105.6	-91.5	-116.4	-99.4	-80.2	-93.7	-114.7	-92.6	-91.5	-102.2	-107.9	-99.4	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	41119	21.9	21.9	10.9	17.5	12.0	19.2	8.2	19.2	31.8	27.4	17.5	14.8	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	41120	12.5	12.5	10.0	10.0	8.7	11.2	8.7	8.7	10.0	8.7	8.7	8.7	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	41110	-64.6	-85.4	-62.9	-77.3	-56.6	-77.9	-58.9	-68.7	-77.9	-82.5	-61.7	-87.7	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	41111	72.3	97.9	75.1	91.4	76.1	99.0	70.7	99.5	115.9	102.8	66.3	94.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	41112	18.6	23.2	14.7	19.2	19.8	22.0	14.7	19.8	19.8	18.6	18.1	22.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	41113	89.4	88.2	86.5	88.8	96.7	86.5	88.2	84.8	95.0	89.4	88.2	86.5	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	41114	-95.5	-113.4	-93.7	-113.1	-93.0	-113.8	-91.1	-114.4	-105.6	-117.6	-84.6	-108.1	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	41121	-70.3	-76.7	-76.1	-67.1	-57.6	-62.4	-65.5	-67.7	-60.3	-70.8	-70.8	-67.7	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	41122	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	41123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	41124	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	41125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	41201	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	41202	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	41205	13.9	15.6	15.7	16.5	12.9	16.5	14.1	13.8	15.3	14.0	12.9	13.9	12.5	16.3	15.2	13.7	14.2	14.2
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	41206	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	41207	8.1	8.0	8.0	10.0	7.2	8.2	9.8	7.7	8.9	8.9	8.2	8.2	7.2	8.7	10.1	8.5	9.9	9.2
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	41208	5.8	6.2	6.9	6.0	9.8	7.1	5.6	5.8	6.0	4.7	5.8	5.8	4.2	6.2	6.2	4.9	9.8	5.8
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	41209	12.1	13.8	13.3	13.6	12.1	14.4	12.3	12.4	13.6	11.7	12.9	13.1	10.9	13.3	13.3	11.2	13.4	13.4
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	41210	13.7	14.3	15.3	17.2	14.4	17.0	15.6	15.5	18.1	15.2	15.8	16.6	13.0	16.3	18.1	13.5	17.2	18.1
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	41211	5.1	6.3	6.4	6.2	5.8	6.3	5.3	6.0	6.2	5.1	5.8	5.7	4.5	6.9	6.3	4.5	6.2	6.8
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	41212	6.1	7.5	7.2	7.2	7.0	7.5	6.4	7.0	7.3	6.0	6.9	7.1	5.4	7.9	7.9	6.1	7.9	7.9
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	41213	5.7	6.8	6.4	6.9	6.5	7.9	7.0	7.1	7.1	6.4	6.8	7.3	5.4	7.4	8.1	6.4	7.9	6.8
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	41127	24.0	30.4	18.0	22.6	15.2	20.0	16.0	18.4	19.6	22.0	18.6	24.6	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	41128	17.2	19.8	15.8	21.6	18.1	20.3	15.8	20.5	15.9	19.2	16.9	19.4	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	41129	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	41130	3.2	4.9	3.0	4.0	2.7	3.5	2.8	3.4	3.4	3.9	3.1	4.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	41131	2.2	3.9	2.1	3.1	1.9	2.6	4.0	3.1	3.1	3.5	3.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	41132	3.6	5.0	3.4	4.5	3.2	4.8	3.7	3.9	3.8	4.4	3.5	4.4	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	41133	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	41134	1.5	1.6	1.4	1.7	1.4	1.5	1.5	1.6	1.4	1.6	1.4	1.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	41135	4.3	5.3	4.3	5.8	4.8	5.3	4.3	5.3	4.3	5.2	4.5	5.3	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	41136	3.0	3.9	3.1	4.7	3.6	4.1	2.9	4.3	3.0	3.8	3.1	4.2	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	41137	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	41138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	41227	19.0	22.3	22.9	20.3	18.8	22.7	16.8	18.8	20.7	18.0	18.8	18.8	14.5	20.9	19.8	14.1	18.6	19.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	41228	15.8	16.9	16.9	18.9	16.9	19.6	17.6	17.6	21.2	17.6	18.0	18.9	14.4	18.0	21.2	15.1	19.0	20.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	41229	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	41230	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	41231	2.4	2.9	2.8	2.5	2.4	3.2	2.1	2.4	2.6	2.1	2.4	2.4	1.8	2.9	2.5	1.7	2.5	2.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	41232	3.5	4.3	4.3	4.1	4.0	4.7	3.8	4.0	4.3	3.9	4.0	4.0	3.4	4.4	4.1	3.4	4.1	4.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	41233	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	41234	3.4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.4	3.4	3.5	3.5	3.2	3.5	3.5	3.4	3.5	3.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	41235	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.5	3.3	3.4	3.4	3.4	3.4	3.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	41236	3.0	3.2	3.3	3.4	3.2	3.5	3.2	3.3	3.2	3.0	3.2	3.5	2.7	3.3	3.5	2.9	3.5	3.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	41237	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	41238	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 1 -KIPS		32.35	32.35	33.28	33.28	33.00	33.00	33.24	33.24	32.35	32.35	33.28	33.28						
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 2 -KIPS		32.70	32.70	32.70	32.55	32.55	32.55	33.30	33.30	33.30	32.62	32.62	32.62	32.75	32.75	32.75	32.58	32.58	32.58

TABLE C5 - TEST DATA FOR TEST 1 ON SECTION 2

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	12218	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	12226	61.0	66.7	56.5	56.5	61.0	70.1	57.6	74.6	72.3	67.8	58.8	66.7
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	12227	55.1	56.6	55.4	52.6	50.6	52.1	49.6	49.9	47.4	49.4	50.9	47.4
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	12228	-43.2	-47.9	-45.1	-45.1	-38.5	-37.4	-42.6	-29.0	-30.3	-36.9	-37.2	-36.6
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	12229	9.7	11.5	9.4	10.3	8.6	9.2	8.0	8.6	9.4	10.0	9.7	10.9
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	12222	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	12236	-30.2	-30.2	-30.6	-30.2	-28.1	-26.7	-28.8	-21.1	-23.2	-23.2	-28.4	-24.6
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	12237	-15.3	-17.0	-18.9	-18.6	-19.5	-18.6	-18.9	-13.4	-15.3	-15.3	-18.4	-16.2
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	12225	185.4	175.3	180.9	168.5	160.6	152.6	160.6	140.2	143.6	152.6	167.3	151.5
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	12201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	12202	41.9	41.9	38.4	41.9	39.6	50.0	39.6	54.7	51.2	43.1	39.6	43.1
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	12203	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	12233	-17.3	-17.8	-17.3	-17.6	-18.4	-20.4	-17.0	-17.6	-17.8	-18.4	-17.3	-18.1
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	12234	1.4	1.4	1.4	1.1	1.6	1.8	1.6	1.6	1.4	1.4	1.4	1.4
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	12235	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	12231	12.3	13.3	12.3	9.6	7.0	8.5	5.8	7.3	5.8	7.8	5.0	7.3
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	12232	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	12204	-33.6	-33.6	-33.6	-28.0	-44.8	-44.8	-28.0	-50.4	-50.4	-33.6	-44.8	-33.6
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	12205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	12206	34.7	33.6	32.5	52.5	45.9	43.7	33.6	42.5	54.9	43.7	52.6	54.9
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	12207	28.0	26.8	26.8	26.8	25.7	28.0	25.7	26.8	24.6	26.8	25.7	26.8
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	12208	-26.5	-25.4	-20.7	-23.1	-20.7	-20.7	-20.7	-18.4	-18.4	-19.6	-20.7	-19.6
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	12124	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	12125	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	12209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	12210	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	12211	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	12212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	12213	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	12214	19.4	24.6	20.0	23.6	20.8	23.4	20.3	20.7	20.2	24.6	19.3	22.8
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	12215	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	12216	2.6	3.9	3.2	4.4	4.6	5.2	3.9	4.7	5.4	6.2	4.3	5.4
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	12217	9.8	13.1	10.3	12.5	12.7	13.8	13.1	13.1	13.8	15.6	12.1	14.9
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	12127	6.8	7.7	7.0	7.1	7.2	7.5	6.4	6.7	7.8	7.4	6.8	6.8
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	12128	16.9	18.5	14.9	16.3	15.6	16.4	15.6	15.0	15.9	16.9	14.7	17.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	12129	2.1	2.3	2.4	2.1	2.1	2.2	2.1	1.9	2.4	2.4	2.0	2.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	12130	2.4	2.7	2.7	2.7	2.7	2.7	2.5	2.2	2.9	2.5	2.2	2.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	12131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	12132	1.1	1.4	1.1	1.3	1.3	1.3	1.1	1.2	1.3	1.3	1.2	1.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	12133	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	12134	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	12135	2.3	3.2	2.2	3.2	2.9	3.2	2.4	3.0	3.2	3.2	2.7	3.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	12136	2.6	3.3	2.5	3.3	3.0	3.1	2.7	3.0	3.1	3.1	2.9	3.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	12137	5.5	6.5	5.4	6.5	5.8	6.2	5.6	6.2	5.9	6.1	5.9	6.3
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	12138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE C6 - TEST DATA FOR TEST 2 ON SECTION 2

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	22218	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	22226	46.3	47.5	41.8	45.2	46.3	58.8	39.5	59.9	53.1	58.8	44.1	49.7
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	22227	60.1	55.1	56.3	55.8	56.8	57.1	52.1	51.3	52.8	58.1	53.8	53.8
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	22228	-49.2	-48.2	-49.8	-49.8	-42.9	-44.1	-49.8	-37.2	-40.6	-46.0	-44.1	-46.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	22229	12.6	12.6	12.3	13.2	9.7	10.3	10.0	10.9	10.3	12.9	11.7	14.3
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	22222	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	22236	-34.1	-37.9	-35.1	-35.8	-31.6	-30.6	-28.1	-27.0	-27.7	-29.1	-31.6	-25.3
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	22237	-14.5	-18.1	-18.6	-21.4	-21.9	-21.4	-17.8	-15.3	-15.9	-18.6	-19.2	-18.6
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	22225	187.7	170.7	168.5	170.7	165.1	168.5	165.1	152.6	150.4	168.5	168.5	156.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	22201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	22202	-50.0	-40.7	-48.9	-40.7	-50.0	-44.2	-38.4	-38.4	-41.9	-39.6	-50.8	-38.4
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	22203	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	22233	-17.6	-20.1	-18.1	-19.8	-19.8	-23.2	-15.3	-20.4	-21.8	-25.4	-19.5	-21.8
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	22234	1.6	1.6	1.6	1.8	1.8	1.4	1.6	1.6	1.6	0.9	1.1	1.6
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	22235	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	22231	8.8	10.1	10.6	8.5	15.9	13.8	10.6	11.3	12.6	12.6	6.8	11.3
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	22232	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	22204	-47.0	-47.0	-49.3	-50.4	-60.5	-60.5	-57.1	-60.5	-60.5	-58.2	-59.2	-58.2
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	22205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	22206	35.8	35.8	36.9	38.1	52.6	49.3	41.4	45.9	45.9	49.3	43.7	43.7
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	22207	31.3	29.1	30.2	29.0	25.7	29.1	31.3	31.3	25.7	29.1	25.7	28.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	22208	-30.0	-26.5	-26.5	-25.4	-24.2	-24.2	-24.2	-24.2	-23.1	-21.9	-24.2	-24.2
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	22124	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	22125	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	22209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	22210	12.6	14.6	13.1	14.4	13.3	16.6	13.0	14.3	14.2	16.1	14.3	15.9
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	22211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	22212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	22213	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	22214	21.8	22.0	20.5	22.2	20.8	22.5	20.5	19.4	23.5	24.3	20.8	21.3
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	22215	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	22216	2.7	3.6	2.8	3.8	3.6	4.3	3.5	4.2	3.7	4.6	3.9	4.9
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	22217	10.5	13.5	13.5	10.4	11.9	11.8	13.3	11.7	12.5	14.7	14.6	11.9
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	22127	6.8	7.0	6.8	6.9	8.0	9.3	5.7	6.8	8.5	8.7	6.8	8.1
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	22128	11.3	13.2	11.9	12.5	12.2	11.4	12.1	11.4	11.4	11.0	10.8	12.6
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	22129	2.1	2.0	2.1	1.9	2.4	2.7	1.7	2.0	2.7	2.7	2.1	2.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	22130	2.4	2.5	2.5	2.5	2.8	3.1	2.2	2.6	2.7	2.8	2.4	2.6
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	22131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	22132	1.1	1.2	1.1	1.2	1.4	1.6	1.0	1.2	1.3	1.6	1.1	1.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	22133	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	22134	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	22135	2.7	3.4	2.9	3.1	3.2	3.2	2.6	2.9	3.3	2.9	2.3	3.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	22136	2.9	3.3	3.0	3.2	3.3	3.2	3.2	2.7	2.8	3.1	2.6	3.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	22137	5.9	6.7	5.9	6.3	6.2	5.7	6.1	6.8	5.3	5.7	5.2	6.3
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	22138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE C7 - TEST DATA FOR TEST 3 ON SECTION 2

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	32101	-101.5	-101.5	-116.4	-93.4	-114.1	-104.9	-125.7	-85.3	-133.8	-114.1	-124.5	-114.1	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	32102	34.6	40.3	36.9	34.6	36.9	29.9	34.6	44.9	32.2	39.2	40.3	27.6	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	32103	152.1	159.2	164.0	148.5	159.2	149.7	160.4	160.4	162.8	162.8	172.3	139.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	32104	-149.1	-116.5	-142.1	-116.5	-128.1	-111.8	-167.7	-125.8	-139.8	-111.8	-151.4	-116.5	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	32105	46.8	38.1	48.9	40.2	41.3	37.0	46.8	27.2	30.4	53.3	43.5	46.8	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	32106	186.8	173.0	205.3	158.0	181.0	182.2	177.6	186.8	200.7	177.6	244.5	167.2	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	32107	-124.6	-119.9	-133.9	-124.6	-130.4	-122.3	-142.1	-116.5	-129.3	-116.5	-137.4	-129.3	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	32108	-21.9	-40.3	-36.9	-28.8	-25.3	-43.8	-42.6	-21.9	-36.9	-42.6	-28.8	-21.9	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	32109	154.9	156.1	158.4	149.1	166.5	143.2	163.0	164.2	154.9	154.9	154.9	152.6	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	32110	-129.4	-141.2	-150.6	-105.9	-164.7	-112.9	-101.2	-115.3	-218.8	-105.9	-105.9	-120.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	32111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	32112	174.7	182.0	166.2	146.8	198.0	160.1	157.7	150.4	166.2	171.1	156.5	138.3	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	32113	-40.7	-45.8	-38.4	-38.4	-40.7	-38.4	-40.7	-38.4	-38.4	-43.0	-38.4	-36.2	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	32114	3.3	4.5	5.6	5.6	6.7	6.7	6.7	6.7	6.7	6.7	7.9	6.7	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	32115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	32116	28.8	31.1	28.8	32.3	30.0	33.4	34.6	31.1	30.0	30.0	30.0	28.8	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	32117	-33.9	-31.6	-33.9	-31.6	-31.6	-33.9	-32.8	-31.6	-33.9	-31.6	-31.6	-30.5	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	32118	-65.0	-76.2	-67.2	-65.0	-63.8	-65.0	-65.0	-66.1	-73.9	-65.0	-69.4	-65.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	32119	19.0	21.2	19.8	17.9	20.1	20.1	19.8	20.1	21.2	20.1	21.2	17.9	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	32120	108.7	117.6	110.9	106.5	102.1	106.5	102.1	106.5	112.0	110.9	109.8	102.1	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	32121	19.0	21.2	19.0	19.0	23.5	19.0	19.0	21.2	19.0	22.4	24.6	17.9	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	32122	-24.2	-27.7	-27.7	-23.1	-27.7	-25.4	-24.2	-30.0	-23.1	-23.1	-28.8	-21.9	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	32209	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	32210	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	32211	25.6	25.1	25.0	26.3	25.5	25.8	25.7	24.0	25.9	26.1	25.9	25.3	26.4	26.7	26.2	25.3
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	32212	14.8	14.5	14.8	16.4	16.2	17.0	17.3	15.6	16.0	16.0	17.1	16.6	17.4	17.4	16.9	16.7
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	32213	7.9	7.4	7.9	7.7	7.9	8.0	8.7	7.9	7.5	6.9	7.9	7.8	7.9	7.4	7.9	7.9
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	32214	2.1	2.0	1.9	2.2	2.1	2.1	2.2	2.2	2.5	2.3	2.1	2.1	2.4	2.3	2.4	2.2
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	32215	7.1	6.9	7.0	7.6	7.5	7.7	7.8	7.4	7.7	7.7	7.7	7.7	7.8	7.9	8.4	8.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	32216	16.9	14.5	16.1	14.9	14.9	15.8	17.2	15.5	15.1	13.5	15.4	14.5	15.0	15.0	16.6	15.5
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	32217	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	32218	6.1	6.5	5.7	7.4	6.8	7.8	7.4	7.0	6.6	7.3	7.3	7.7	7.8	8.8	6.8	7.9
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	32219	16.3	16.1	15.9	16.5	14.3	17.2	17.6	17.4	15.5	15.0	16.3	16.4	16.6	15.5	16.0	17.4
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	32127	8.6	9.7	9.2	9.0	8.8	9.9	9.0	10.0	9.0	10.1	11.3	7.8	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	32128	17.3	17.1	18.8	15.1	16.3	14.8	16.5	17.2	17.4	15.3	17.9	15.8	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	32129	1.3	1.6	1.3	1.4	1.3	1.9	1.7	1.6	1.4	1.9	2.4	1.2	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	32130	3.2	3.3	3.1	3.1	2.8	3.1	3.2	3.0	3.0	3.5	3.9	2.6	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	32131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	32132	3.0	3.4	3.2	2.9	3.1	3.3	3.1	3.3	3.1	3.5	3.4	2.8	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	32133	0.7	0.8	0.8	0.6	0.7	0.8	0.7	0.7	0.8	0.7	0.8	0.6	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	32134	0.9	1.0	1.1	0.8	1.1	1.4	0.9	1.1	1.1	0.9	1.1	0.9	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	32135	2.9	2.9	3.2	2.5	3.1	2.4	2.7	3.0	3.0	2.6	3.1	2.6	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	32136	2.8	2.8	3.1	2.4	2.7	2.2	2.7	2.7	2.9	2.5	2.6	2.5	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	32137	3.9	3.9	4.2	3.5	3.5	3.1	3.7	4.0	4.1	3.3	4.2	3.6	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	32138	4.0	4.1	4.6	4.4	4.4	3.6	3.8	4.5	4.4	3.7	4.8	4.2	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	32227	8.3	8.0	7.8	9.1	8.8	8.5	8.6	7.0	9.2	10.2	8.7	8.1	9.6	9.6	9.8	8.4
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	32228	18.8	16.7	18.5	16.8	16.7	17.6	19.5	17.5	16.8	15.1	17.4	16.6	16.7	16.5	17.7	17.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	32229	1.1	1.0	1.0	1.3	1.2	1.2	1.1	0.9	1.3	1.6	1.3	1.1	1.4	1.5	1.5	1.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	32230	3.5	3.3	3.3	3.6	3.4	3.4	3.4	2.9	3.4	3.8	3.4	3.1	3.5	3.6	3.8	3.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	32231	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	32232	2.9	2.7	2.7	2.9	2.9	2.9	2.9	2.7	3.0	3.0	2.8	2.7	3.0	3.8	3.2	2.8
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	32233	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.6	0.7	0.7	0.7
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	32234	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	32235	1.0	0.9	0.9	0.9	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.1	1.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	32236	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	32237	2.2	1.9	2.0	1.9	1.9	2.1	2.2	2.0	1.8	1.7	2.0	1.9	1.9	1.9	2.0	2.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	32238	3.8	3.2	3.5	3.0	3.1	3.1	3.6	3.2	3.1	2.7	3.1	3.0	2.9	2.8	3.2	3.0
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 1 -KIPS		32.35	32.35	33.28	33.28	32.35	32.35	33.28	33.28	32.35	32.35	33.28	33.28				
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 2 -KIPS		33.40	33.40	32.85	32.85	32.80	32.80	32.92	32.92	33.00	33.00	33.24	33.24	33.40	33.40	32.85	32.85

TABLE C8 - TEST DATA FOR TEST 4 ON SECTION 2

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	42101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	42102	23.2	25.0	29.1	30.2	31.4	33.7	23.8	34.3	29.1	19.7	30.8	34.9	18.6	40.7	20.3	17.4	26.7	29.1
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	42103	101.8	88.5	93.3	106.7	92.1	105.4	99.4	91.5	102.4	146.7	90.3	98.8	95.1	98.8	93.3	100.0	81.2	88.5
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	42104	-82.0	-73.3	-108.2	-108.2	-62.8	-103.5	-119.8	-69.8	-115.2	-119.3	-90.2	-112.9	-112.3	-100.6	-128.6	-110.5	-107.4	-131.5
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	42105	34.9	33.7	26.7	35.5	25.6	22.1	29.6	23.8	26.7	28.5	34.3	23.2	32.5	32.0	26.7	26.7	29.6	30.8
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	42106	81.3	62.9	71.8	81.9	62.3	67.1	81.3	57.6	72.4	83.1	80.1	68.8	73.0	61.1	74.8	72.4	62.3	75.4
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	42107	-79.6	-76.8	-106.5	-125.1	-92.7	-101.0	-105.9	-72.4	-122.9	-133.9	-107.0	-127.9	-114.7	-119.1	-139.4	-86.3	-82.9	-130.1
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	42108	-14.2	-16.1	-16.8	-21.9	-19.4	-11.6	-17.4	-11.6	-17.4	-19.4	-19.4	-19.4	-19.4	-19.4	-18.1	-14.2	-16.1	-16.8
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	42109	138.0	75.8	101.5	139.7	97.0	115.8	122.1	87.3	131.8	103.8	100.9	131.8	107.2	119.8	123.8	106.6	79.8	108.4
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	42118	-144.6	-123.2	-142.8	-158.7	-114.8	-141.2	-151.8	-128.5	-160.8	-161.3	-135.4	-152.3	-166.6	-146.0	-156.0	-156.0	-134.9	-163.8
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	42119	-22.8	-19.0	-27.1	-30.4	-19.5	-22.3	-26.6	-22.3	-38.6	-28.2	-23.3	-28.2	-36.9	-27.1	-33.1	-28.8	-16.3	-33.7
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	42120	143.3	105.8	127.5	141.7	93.1	126.4	141.2	106.3	143.9	139.1	126.4	135.9	134.9	115.3	132.2	122.7	97.8	84.1
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	42110	-79.9	-78.1	-78.1	-98.6	-80.5	-99.1	-79.3	-79.9	-101.5	-71.1	-85.1	-95.6	-78.1	-49.0	-89.8	-78.1	-80.5	-86.3
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	42111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	42112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	42113	33.4	24.6	19.5	20.0	20.5	26.7	21.6	20.0	22.1	19.5	24.6	26.2	15.4	23.1	25.2	18.0	22.1	23.6
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	42114	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	42121	-50.5	-50.0	-50.0	-56.5	-50.0	-58.6	-50.0	-48.5	-58.1	-51.5	-55.5	-65.1	-47.5	-56.0	-56.0	-51.0	-50.0	-61.1
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	42122	17.9	19.5	15.8	17.9	17.9	19.0	17.9	18.5	24.3	16.3	21.6	23.2	11.6	21.6	23.8	19.5	19.5	20.1
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	42123	96.2	89.3	88.3	96.8	83.0	99.4	90.4	83.5	101.5	89.3	95.2	102.0	80.4	94.6	94.1	76.1	78.2	97.3
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	42124	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	42125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	42201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	42202	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	42205	24.5	21.3	22.9	24.3	21.4	23.7	22.6	22.1	21.6	22.2	21.6	21.5	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	42206	25.8	25.6	26.1	26.8	26.4	26.4	27.7	28.3	26.3	26.4	26.8	26.5	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	42207	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	42208	15.0	14.5	15.1	15.3	16.2	17.2	15.4	15.0	15.4	15.6	15.4	15.4	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	42209	17.7	18.4	18.3	19.0	18.7	19.1	14.3	19.1	18.2	18.7	19.3	18.5	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	42210	23.0	23.7	24.7	24.9	22.0	21.4	24.7	24.9	22.0	23.1	23.1	22.9	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	42211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	42212	11.6	12.8	12.8	13.5	12.6	13.4	12.9	13.6	12.5	13.1	12.6	4.2	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	42213	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	42127	14.3	12.3	13.1	18.0	16.0	15.8	14.3	15.2	16.2	12.3	16.8	17.8	12.1	17.6	15.4	12.7	12.9	13.9
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	42128	17.1	14.5	16.0	17.9	17.3	13.2	16.2	12.7	16.0	17.7	17.9	14.8	13.0	16.6	17.7	15.1	15.7	18.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	42129	2.8	2.2	2.3	3.8	2.9	3.0	2.7	3.2	3.3	2.1	2.8	3.4	2.2	3.2	3.1	3.6	2.3	2.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	42130	2.6	2.0	2.1	3.0	2.9	2.6	2.5	2.8	2.9	2.0	2.9	3.1	2.0	2.9	2.6	3.3	2.0	2.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	42131	2.9	2.5	2.6	3.5	3.2	3.0	2.9	2.9	3.1	2.5	3.2	3.4	2.5	3.2	3.0	3.3	2.5	2.6
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	42132	2.5	2.2	2.4	3.1	2.8	2.6	2.5	2.5	2.7	2.3	2.7	2.8	2.2	2.7	2.6	2.8	2.3	2.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	42133	1.6	1.5	1.6	1.9	1.6	1.6	1.6	1.6	1.8	1.6	1.8	1.8	1.6	1.8	1.8	1.6	1.6	1.7
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	42134	2.5	2.3	2.4	2.6	2.5	2.1	2.5	2.2	2.5	2.5	2.6	2.2	2.1	2.6	2.6	3.2	2.4	2.6
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	42135	3.7	3.3	3.7	4.1	3.9	3.3	3.7	3.2	3.8	3.8	4.1	3.3	3.2	3.9	4.0	3.2	3.7	4.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	42136	3.7	3.3	3.6	4.1	4.1	3.2	3.7	2.8	3.7	4.0	4.2	3.2	3.8	3.9	4.1	2.8	3.5	4.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	42137	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	42138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	42227	15.8	14.7	14.7	15.8	17.0	18.0	14.7	15.4	16.4	15.2	14.9	15.8	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	42228	17.3	18.3	18.3	17.9	14.9	15.7	18.3	18.5	17.0	16.8	15.5	16.4	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	42229	4.5	4.7	4.7	4.6	3.8	4.0	4.7	4.8	4.4	4.3	4.1	4.3	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	42230	2.6	2.4	2.7	2.4	2.7	3.0	2.6	2.1	2.6	2.6	3.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	42231	2.7	2.6	2.5	2.5	2.9	3.0	2.6	2.4	2.7	2.8	3.4	2.9	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	42232	2.6	2.7	2.7	2.7	2.8	2.9	2.7	2.6	2.7	2.7	3.1	2.7	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	42233	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	42234	3.0	3.0	3.0	3.0	3.0	3.0	3.1	3.0	2.9	3.0	3.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	42235	6.3	6.4	6.4	6.3	6.0	6.0	6.4	6.4	6.2	6.2	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	42236	4.0	4.2	4.0	4.0	3.6	3.6	3.9	4.1	3.7	3.7	3.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	42237	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	42238	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 1 -KIPS		32.78	32.78	32.78	32.47	32.47	32.47	32.70	32.70	32.70	32.55	32.55	32.55	32.75	32.75	32.75	32.50	32.50	32.50
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 2 -KIPS		33.00	33.00	33.24	33.24	33.00	33.00	33.24	33.24	33.00	33.00	33.24	33.24						

TABLE C9 - TEST DATA FOR TEST 1 ON SECTION 3

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	13218	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	13222	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	13227	6.9	5.5	6.6	4.8	4.5	4.1	5.2	3.4	4.1	4.5	4.8	4.1
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	13228	-4.4	-4.4	-4.4	-4.4	-4.0	-4.0	-4.4	-3.7	-3.3	-4.4	-4.4	-4.4
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	13229	1.3	1.7	1.3	1.7	1.7	2.0	1.7	2.0	1.7	1.7	1.7	2.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	13226	179.6	162.6	184.4	151.6	135.9	131.0	148.0	219.6	122.5	135.9	144.4	124.9
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	13230	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	13236	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	13237	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	13201	-167.7	-161.9	-167.7	-149.1	-136.3	-156.1	-144.4	-114.1	-111.8	-145.6	-143.2	-140.9
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	13202	40.7	41.9	39.6	33.7	43.1	43.1	32.6	37.2	47.7	45.4	31.4	36.1
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	13203	166.5	161.9	164.2	151.4	142.1	151.4	133.9	114.1	118.8	153.7	136.3	142.1
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	13233	-12.4	-12.4	-12.4	-12.1	-12.8	-14.9	-12.8	-12.8	-13.1	-13.4	-12.1	-13.1
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	13234	2.0	2.3	2.3	2.0	2.3	2.6	2.3	2.6	2.6	2.3	2.0	2.6
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	13235	15.8	14.5	15.8	12.3	17.7	20.2	14.5	12.6	12.9	12.3	10.1	9.8
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	13231	5.9	7.1	5.9	5.5	5.1	6.3	5.1	5.5	5.1	5.5	5.1	5.9
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	13232	-3.8	-3.8	-3.4	-4.1	-3.8	-4.1	-3.1	-3.4	-3.4	-3.8	-3.4	-4.1
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	13204	-49.9	-44.3	-49.9	-38.8	-49.9	-49.9	-38.8	-44.3	-49.9	-33.2	-88.7	-94.3
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	13205	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	13206	64.8	63.7	60.4	54.9	69.2	74.7	62.6	62.6	64.8	72.5	62.6	62.6
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	13207	56.6	66.7	56.6	54.3	54.3	53.2	54.3	52.0	50.9	53.2	53.2	50.9
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	13208	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	13124	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	13125	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	13209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	13210	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	13211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	13212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	13213	15.7	16.4	15.7	16.0	16.9	18.2	16.0	18.0	17.2	18.1	16.9	17.8
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	13214	30.4	31.7	30.5	31.8	31.9	35.4	30.6	34.4	33.2	35.6	32.4	33.8
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	13215	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	13216	10.0	11.0	10.4	10.8	12.3	13.6	11.6	13.4	13.4	14.1	12.3	13.7
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	13217	8.8	9.5	9.0	9.9	10.4	11.1	9.7	12.1	11.4	12.2	11.0	11.7
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	13127	13.7	13.7	13.0	12.4	13.2	14.4	12.3	13.1	13.2	13.4	12.3	13.5
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	13128	10.1	10.1	10.0	10.9	11.0	11.1	8.9	11.0	11.7	11.5	10.1	11.6
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	13129	4.1	4.0	4.0	3.7	3.9	4.0	4.1	5.9	3.9	3.9	3.8	4.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	13130	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	13131	3.7	3.7	3.5	3.4	3.7	3.9	3.2	3.7	3.7	3.7	3.3	3.7
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	13132	2.0	2.0	1.9	1.9	2.0	2.2	1.8	2.1	2.1	2.1	1.8	2.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	13133	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	13134	1.1	1.2	1.1	1.1	1.2	1.3	0.9	1.2	1.2	1.2	1.0	1.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	13135	2.0	2.1	1.8	2.0	2.1	2.2	1.7	2.2	2.2	2.2	1.9	2.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	13136	1.7	1.9	1.6	1.9	1.9	2.1	1.5	2.0	2.1	2.1	1.8	2.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	13137	1.5	1.6	1.5	1.6	1.6	1.7	1.5	1.7	1.7	1.7	1.6	1.7
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	13138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE C10 - TEST DATA FOR TEST 2 ON SECTION 3

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	23218	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	23222	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	23227	6.6	5.9	6.9	5.9	5.9	6.2	5.9	3.4	2.7	5.9	5.9	5.5
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	23228	-7.4	-7.7	-7.8	-6.2	-5.9	-6.2	-7.7	-4.8	-5.9	-6.6	-7.0	-7.7
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	23229	3.4	3.4	1.7	2.7	1.7	2.7	3.0	3.0	3.4	2.3	3.4	3.4
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	23226	166.2	155.3	186.8	150.4	154.1	150.4	129.8	101.9	95.8	138.3	138.3	114.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	23230	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	23236	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	23237	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	23201	-145.6	-142.1	-130.4	-108.3	-130.4	-145.6	-137.4	-83.8	-82.7	-118.8	-136.3	-128.1
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	23202	-38.4	-44.2	-38.4	-38.4	-39.6	-46.6	-33.7	-32.6	-38.4	-40.7	-46.6	-38.4
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	23203	153.7	143.2	149.1	178.2	152.6	143.2	119.9	102.5	108.3	135.1	130.4	123.4
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	23233	-13.4	-14.0	-17.8	-14.3	-18.4	-18.7	-11.8	-15.6	-15.6	-18.7	-15.6	-16.2
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	23234	4.4	3.8	5.3	6.2	5.3	6.8	3.8	4.7	6.8	6.8	6.2	6.8
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	23235	15.8	12.9	39.5	19.0	25.6	48.4	12.6	17.4	16.4	25.3	15.8	16.4
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	23231	7.9	7.9	7.1	7.5	5.9	7.9	7.1	7.9	7.9	7.9	7.5	7.9
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	23232	-4.1	-4.1	-3.8	-4.1	-3.8	-4.1	-3.4	-3.8	-3.8	-3.8	-3.4	-3.8
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	23204	-41.0	-39.9	-38.8	-35.5	-49.9	-55.4	-38.8	-39.9	-46.6	-51.0	-39.9	-37.7
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	23205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	23206	56.0	63.7	60.4	50.5	72.5	81.3	52.7	62.6	70.3	67.0	61.5	53.8
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	23207	47.5	53.2	47.5	47.5	41.8	45.2	48.6	39.6	46.4	47.5	44.1	41.8
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	23208	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	23124	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	23125	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	23209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	23210	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	23211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	23212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	23213	15.2	16.4	15.6	15.9	16.4	24.9	14.0	15.5	15.9	17.1	15.3	16.9
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	23214	33.3	34.1	30.9	33.8	31.4	32.0	32.5	33.8	36.1	33.3	33.3	29.2
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	23215	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	23216	14.2	15.3	14.7	14.9	16.0	17.3	14.2	17.3	17.3	17.4	16.0	18.0
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	23217	9.4	10.2	8.8	10.2	8.9	9.2	9.6	12.8	10.2	10.5	10.2	12.9
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	23127	14.9	15.6	14.4	14.4	15.7	17.7	12.0	13.7	14.9	16.8	13.1	13.9
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	23128	11.1	10.8	10.1	10.7	10.0	10.5	9.9	10.9	12.1	11.4	11.2	11.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	23129	2.7	2.9	2.8	2.7	3.1	3.5	2.3	2.5	2.9	-3.3	3.0	3.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	23130	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	23131	2.4	2.6	2.3	2.3	2.8	3.2	1.4	2.2	2.7	3.8	-2.1	2.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	23132	2.1	2.4	2.1	2.2	2.4	2.7	1.2	1.7	1.8	2.5	2.0	2.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	23133	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	23134	1.1	1.1	1.4	1.2	1.0	1.1	1.4	1.7	1.3	0.9	1.1	1.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	23135	2.2	2.3	2.0	2.2	2.2	2.2	1.9	2.1	2.5	2.3	2.1	2.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	23136	1.9	2.1	1.7	2.1	2.0	1.8	1.7	2.8	2.5	2.2	2.0	2.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	23137	1.7	1.8	1.6	1.7	1.6	1.6	1.8	1.7	1.9	1.7	1.7	1.9
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	23138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE C11 - TEST DATA FOR TEST 3 ON SECTION 3

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	33101	-96.8	-100.3	-104.9	-93.4	-109.5	-88.8	-113.0	-100.3	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	33102	29.7	33.2	24.9	27.3	38.0	29.7	36.8	30.9	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	33103	167.5	168.8	164.9	155.7	176.7	161.0	185.8	159.6	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	33104	-87.3	-81.5	-104.8	-82.7	-83.8	-94.3	-114.1	-95.5	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	33105	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	33106	165.2	140.2	166.4	146.2	153.3	159.2	153.3	149.7	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	33107	-129.1	-119.9	-129.1	-114.1	-143.0	-126.8	-131.4	-109.5	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	33108	-44.0	-34.9	-47.8	-37.5	-55.6	-41.4	-50.4	-45.3	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	33109	134.7	135.7	133.4	128.9	141.3	126.6	157.2	132.3	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	33110	-109.0	-99.1	-109.0	-79.3	-97.9	-81.7	-99.1	-84.2	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	33111	-32.6	-31.4	-34.9	-37.2	-36.1	-38.4	-38.4	-48.9	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	33112	161.4	134.9	144.1	103.8	128.0	104.9	128.0	141.8	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	33113	-43.6	-48.3	-40.0	-42.4	-48.3	-45.9	-48.3	-40.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	33114	8.9	15.6	8.9	15.6	13.4	17.9	15.6	20.1	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	33115	29.2	31.9	29.2	29.2	31.9	31.9	31.9	31.9	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	33116	52.0	49.8	44.1	49.8	47.5	50.9	43.0	48.6	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	33117	-13.3	-14.6	-14.6	-14.6	-14.6	-15.8	-12.1	-13.3	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	33118	-59.0	-63.8	-62.6	-61.4	-60.2	-59.0	-67.4	-62.6	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	33119	17.3	20.7	17.3	19.6	20.7	23.1	27.7	30.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	33120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	33121	23.9	23.9	23.9	23.9	25.0	23.9	25.0	23.9	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	33122	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	33209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	33210	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	33211	2.8	2.9	2.9	2.8	2.4	3.0	3.0	2.5	2.7	2.7	2.8	3.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	33212	11.6	13.1	12.9	12.9	12.5	13.7	14.1	13.1	13.2	14.1	13.6	13.8
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	33213	8.1	8.7	8.6	8.2	8.2	7.6	8.6	7.9	7.8	8.1	8.1	7.8
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	33214	20.2	21.3	20.5	20.6	20.6	21.9	22.4	21.4	22.0	22.3	21.4	22.4
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	33215	11.8	14.0	12.5	13.8	13.2	13.8	14.1	14.8	14.1	15.1	14.1	15.1
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	33216	16.6	17.2	16.6	16.1	16.3	14.6	16.0	15.3	14.9	15.2	15.9	15.0
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	33217	11.0	11.2	11.2	10.9	10.8	11.6	11.9	11.6	11.9	12.0	11.7	12.2
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	33218	8.6	9.9	9.2	9.3	9.2	9.1	10.0	9.9	9.8	10.1	10.0	10.1
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	33219	15.0	16.1	16.1	16.1	16.1	14.8	15.9	15.2	15.0	15.4	16.1	15.2
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	33127	12.7	14.0	13.3	13.0	13.8	14.0	13.8	13.7	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	33128	14.7	14.0	15.9	14.4	14.3	14.8	14.9	14.5	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	33129	2.3	2.6	2.3	2.4	2.4	2.5	2.5	2.5	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	33130	2.3	2.5	2.3	2.4	2.4	2.4	2.5	2.4	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	33131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	33132	2.6	2.7	2.7	2.8	2.8	2.7	2.7	2.7	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	33133	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	33134	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.8	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	33135	2.7	2.7	2.8	2.6	2.7	2.9	2.7	2.8	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	33136	2.6	2.4	2.7	2.5	2.5	2.6	2.6	2.5	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	33137	3.5	3.4	3.7	3.3	3.4	3.5	3.6	3.4	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	33138	3.3	3.2	3.6	3.1	3.4	3.5	3.5	3.7	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	33227	12.9	14.1	13.0	12.1	12.3	14.0	14.2	14.3	14.4	14.9	13.8	15.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	33228	16.0	16.3	16.0	16.2	16.9	14.1	15.6	16.2	14.3	15.4	16.2	15.6
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	33229	2.0	2.1	1.9	2.1	2.0	2.2	2.2	2.4	2.2	2.4	2.1	2.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	33230	3.0	3.1	3.0	3.0	2.9	3.0	3.1	3.3	3.1	3.2	3.1	3.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	33231	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	33232	2.8	3.0	2.9	2.8	2.8	2.8	3.0	2.9	3.0	3.0	2.9	3.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	33233	1.1	1.2	1.1	1.2	1.1	1.1	1.1	1.2	1.2	1.2	1.1	1.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	33234	1.2	1.4	1.3	1.3	1.3	1.4	1.4	1.5	1.4	1.5	1.5	1.6
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	33235	2.8	3.0	2.9	2.8	2.9	2.7	2.8	2.9	2.7	2.8	2.9	2.8
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	33236	3.7	3.7	3.4	3.6	3.7	3.0	3.6	3.4	3.2	3.4	3.4	3.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	33237	3.2	3.6	3.5	3.5	3.5	3.2	3.6	3.1	3.3	3.4	3.6	3.4
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	33238	3.6	4.1	4.0	4.1	4.0	3.6	3.8	3.7	3.7	3.9	4.0	3.8
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 1 -KIPS		33.00	33.00	33.24	33.24	33.40	33.40	32.85	32.85				
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 2 -KIPS		32.97	32.97	32.66	32.66	32.80	32.80	32.92	32.92	33.40	33.40	32.85	32.85

TABLE C12 - TEST DATA FOR TEST 4 ON SECTION 3

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	43101	-118.2	-78.8	-97.0	-130.3	-83.6	-115.1	-106.0	-57.5	-115.1	-121.8	-106.0	-124.2	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	43102	24.1	31.1	28.8	18.8	31.7	38.7	24.1	27.6	31.7	14.1	41.7	44.6	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	43103	192.3	177.9	202.3	195.6	177.3	201.2	201.7	161.2	201.7	191.2	164.6	204.5	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	43104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	43105	17.6	22.3	23.5	17.6	18.2	19.3	22.3	22.3	19.9	15.8	17.6	18.8	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	43106	128.0	128.0	145.5	130.5	113.4	145.5	146.0	97.7	131.5	129.2	122.8	140.2	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	43107	-130.3	-97.1	-172.8	-143.1	-97.1	-152.4	-166.4	-96.6	-155.9	-122.2	-94.2	-135.6	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	43108	28.8	27.0	37.4	34.5	29.9	35.1	36.8	25.9	34.5	25.9	27.6	27.6	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	43109	181.2	150.0	177.0	160.0	150.0	169.2	202.2	120.0	189.0	183.0	158.0	164.3	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	43118	-63.5	-49.5	-48.5	-57.1	-46.3	-62.5	-75.9	-35.0	-70.0	-82.4	-50.7	-64.1	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	43119	43.2	42.1	42.1	42.1	34.7	42.6	41.5	34.9	44.3	50.4	44.3	48.7	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	43120	105.8	89.4	101.5	102.6	76.1	104.2	104.7	64.0	104.2	111.1	92.5	109.5	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	43110	-61.1	-73.1	-79.8	-68.6	-77.1	-78.8	-75.4	-68.6	-83.4	-71.4	-77.1	-86.9	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	43111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	43112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	43113	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	43114	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	43121	-65.6	-74.7	-77.5	-69.0	-76.9	-76.9	-73.5	-70.7	-84.8	-71.8	-86.0	-82.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	43122	13.5	14.1	13.5	16.9	15.8	15.2	15.2	14.1	15.2	17.5	16.9	16.1	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	43123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	43124	85.4	88.0	89.6	89.8	86.4	90.6	88.0	80.1	92.7	85.4	92.2	90.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	43125	-35.1	-37.2	-37.2	-34.5	-36.6	-39.3	-39.3	-40.8	-41.4	-39.3	-42.4	-41.4	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	43301	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	43302	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	43305	26.5	28.6	29.0	27.7	27.5	28.5	26.6	28.6	28.6	27.3	24.4	28.6	27.5	28.6	28.5	24.4	28.6	28.5
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	43306	11.2	12.5	12.6	11.7	12.2	12.2	11.6	12.2	12.6	11.4	14.5	12.3	11.7	12.5	12.0	12.0	12.8	11.9
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	43307	6.9	7.7	6.9	6.8	8.1	6.2	6.9	6.9	7.3	6.0	8.5	6.1	6.2	7.2	6.7	7.4	7.7	6.4
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	43308	30.2	33.8	34.9	32.1	32.1	32.6	30.1	31.8	34.3	30.1	37.6	32.9	32.1	32.6	31.5	34.2	33.5	32.6
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	43309	28.6	30.3	30.7	29.9	30.4	29.5	30.2	30.2	31.4	28.4	32.3	30.5	29.7	30.9	30.2	32.2	31.1	30.5
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	43310	8.2	8.7	8.0	8.2	9.2	7.7	8.2	8.2	8.8	7.2	9.4	7.6	8.1	8.4	7.8	9.3	9.0	6.4
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	43311	10.9	12.3	12.2	11.4	11.8	11.4	10.4	12.9	11.8	11.9	13.3	11.4	11.2	12.2	11.1	12.9	13.0	11.1
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	43312	17.8	19.9	19.1	18.8	20.2	18.6	18.0	20.2	19.9	18.8	23.4	19.0	16.5	20.0	18.7	15.6	16.5	16.8
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	43213	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	43127	13.4	17.3	18.2	16.1	17.6	19.2	17.3	15.5	20.1	15.1	17.6	19.2	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	43128	11.8	14.7	13.9	12.3	11.9	13.9	13.2	11.4	14.1	11.8	13.9	13.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	43129	2.2	2.9	3.4	2.9	3.2	3.7	3.1	2.7	3.9	2.3	3.1	3.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	43130	2.3	2.8	3.2	2.8	3.0	3.3	2.9	2.7	3.5	2.4	2.9	3.2	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	43131	3.0	3.7	4.0	3.3	3.7	4.1	3.6	3.2	4.4	3.8	3.7	4.1	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	43132	3.7	4.0	4.2	3.6	3.7	4.4	3.9	3.6	4.2	3.5	4.1	4.3	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	43133	1.9	2.2	2.3	1.9	2.0	2.3	2.0	1.9	2.3	1.9	2.2	2.3	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	43134	2.9	2.9	3.0	2.5	2.6	3.0	2.7	2.5	3.1	2.5	2.8	2.9	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	43135	2.9	3.5	3.6	2.9	3.0	3.4	3.2	2.9	3.5	2.9	3.5	3.4	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	43136	1.8	2.5	2.3	1.9	1.9	2.2	2.0	1.9	2.4	1.7	2.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	43137	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	43138	2.4	2.9	2.5	2.5	2.1	2.5	2.6	2.4	2.9	2.4	2.7	2.4	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	43227	12.7	16.4	15.8	17.0	12.7	16.8	14.9	18.3	15.5	14.9	14.7	18.3	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	43228	12.6	13.9	13.7	12.6	14.1	14.2	15.0	13.5	14.2	13.9	13.9	14.4	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	43229	1.8	2.6	2.3	2.8	1.7	2.7	2.2	3.0	2.3	2.3	2.3	3.1	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	43230	2.6	3.3	3.1	3.5	2.4	3.2	2.9	3.5	3.1	3.1	2.9	3.5	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	43231	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	43232	3.4	4.5	3.7	4.1	3.5	4.1	3.6	4.1	3.6	3.7	3.7	4.2	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	43233	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	43234	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.3	0.8	0.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	43235	3.0	3.3	3.1	3.0	3.0	3.1	3.1	3.0	3.0	3.0	2.6	3.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	43236	2.2	2.5	2.3	2.3	2.3	2.5	2.5	2.4	2.4	2.6	2.4	2.6	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	43237	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	43238	2.7	2.5	2.5	2.2	2.9	2.6	2.8	2.4	2.6	2.9	2.6	2.7	0.0	0.0	0.0	0.0	0.0	0.0
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 1 -KIPS		32.70	32.70	32.70	32.55	32.55	32.55	32.70	32.70	32.70	32.55	32.55	32.55						
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 2 -KIPS		32.35	32.35	33.28	33.28	32.35	32.35	33.28	33.28	32.97	32.97	32.66	32.66						
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 3 -KIPS		33.30	33.30	33.30	32.62	32.62	32.62	32.78	32.78	32.79	32.47	32.47	32.47	33.30	33.30	33.30	32.62	32.62	32.62

TABLE C13 - TEST DATA FOR TEST 1 ON SECTION 6

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	16101	-249.3	-233.0	-249.3	-200.3	-207.3	-219.8	-198.0	-144.4	-139.8	-205.0	-193.3	-205.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	16102	37.2	37.2	34.9	53.5	51.2	44.2	53.5	74.5	65.2	46.6	55.9	58.2
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	16103	312.2	288.9	302.9	286.5	237.6	260.9	274.9	226.0	202.7	246.9	272.6	270.2
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	16104	-269.5	-260.4	-255.8	-258.1	-228.4	-226.1	-251.2	-210.1	-219.2	-223.8	-235.2	-219.2
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	16105	-36.5	-36.5	-41.1	-57.1	-50.2	-43.4	-52.5	-59.3	-54.8	-38.8	-54.8	-43.4
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	16106	302.9	291.2	293.5	265.6	242.3	256.3	253.9	198.0	202.7	265.6	263.2	244.6
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	16107	-254.5	-237.3	-254.5	-209.2	-196.3	-217.8	-215.7	-157.4	-138.0	-202.7	-213.5	-204.9
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	16108	-60.4	-53.9	-62.5	-38.8	-43.1	-51.7	-43.1	-19.4	-23.7	-43.1	-36.6	-36.6
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	16109	257.5	230.9	253.4	235.0	185.9	204.3	224.8	188.0	159.4	200.2	228.7	222.7
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	16110	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	16111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	16112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	16113	-181.5	-190.5	-177.0	-172.6	-195.0	-208.4	-181.5	-215.1	-203.9	-188.2	-197.2	-208.4
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	16114	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	16115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	16116	47.5	43.0	47.5	33.9	40.7	43.0	47.5	47.5	45.2	40.7	40.7	45.2
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	16118	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	16119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	16123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	16125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	16126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	16124	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	16209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	16201	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	16211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	16212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	16213	4.4	5.1	4.1	5.0	5.1	5.8	5.0	5.9	6.3	6.1	4.0	4.5
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	16214	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	16215	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	16216	8.7	9.5	8.5	9.5	10.0	10.4	8.7	9.9	12.7	10.8	9.3	9.8
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	16217	4.1	5.3	4.4	4.5	5.1	7.7	4.6	7.1	6.8	6.7	5.5	7.3
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	16218	2.1	2.2	2.1	2.1	2.4	2.9	2.1	2.9	2.8	2.7	2.2	2.9
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	16219	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	16127	6.9	7.5	7.7	7.1	7.7	8.9	7.2	8.3	7.5	8.4	7.0	9.1
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	16128	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	16129	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	16130	2.4	2.6	2.8	2.9	2.7	3.2	2.4	2.9	2.5	2.9	2.3	3.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	16131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	16132	0.5	0.6	0.6	0.5	0.6	0.8	0.4	0.6	0.6	0.7	0.5	0.8
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	16133	0.4	0.5	0.4	0.4	0.5	0.6	0.4	0.5	0.5	0.6	0.4	0.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	16134	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	16135	2.8	2.9	2.8	2.9	3.0	3.0	2.7	3.0	3.2	3.1	3.0	3.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	16136	1.4	1.6	1.4	1.6	1.6	1.9	1.2	1.7	2.2	2.0	1.4	1.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	16137	1.4	1.6	1.3	1.6	1.7	1.7	1.2	1.6	2.3	1.7	1.5	1.3
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	16138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	16227	6.6	7.3	7.3	6.6	7.4	8.7	5.8	8.6	7.3	7.7	6.6	8.9
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	16228	5.1	5.7	4.7	5.7	5.7	6.2	5.0	5.8	7.6	6.6	5.2	5.6

TABLE C14 - TEST DATA FOR TEST 2 ON SECTION 6

RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS
RAIL SEAT FORCE MAIN ARRAY -SOUTH SFAT LOAD CELL TIE -KIPS

REDUCED RAIL DATA

TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
26101	-228.3	-223.6	-228.3	-198.0	-177.0	-200.3	-200.3	-132.8	-135.1	-205.0	-181.7	-181.7
26102	23.3	30.2	25.6	46.6	41.9	37.2	41.9	53.5	46.6	32.6	37.2	34.9
26103	403.0	410.0	414.7	407.7	349.5	419.4	389.1	342.5	321.5	384.4	384.4	372.8
26104	-228.4	-246.7	-260.4	-271.8	-228.4	-230.7	-253.5	-205.5	-210.1	-223.8	-230.7	-228.4
26105	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26106	298.2	323.8	307.5	281.9	256.3	312.2	277.2	195.7	223.6	277.2	288.9	260.9
26107	-248.1	-258.8	-248.1	-220.0	-187.6	-222.2	-194.1	-155.3	-138.0	-207.1	-189.8	-194.1
26108	-45.3	-49.6	-45.3	-28.0	-34.5	-53.4	-32.3	-23.7	-25.8	-43.1	-38.8	-32.3
26109	245.2	247.3	263.6	245.2	192.1	226.8	214.6	183.9	143.0	183.9	188.0	183.9
26110	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26113	-174.8	-208.4	-181.5	-183.8	-228.6	-248.8	-190.5	-215.1	-212.9	-217.4	-201.7	-208.4
26114	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26116	43.0	58.8	54.3	49.8	47.5	65.6	49.8	56.6	47.5	45.2	47.5	49.8
26118	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26124	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26201	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5
26211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26213	3.2	4.3	3.2	3.2	4.6	4.8	5.3	4.3	4.9	4.5	3.8	4.3
26214	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26215	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26216	7.8	9.6	8.1	10.1	8.9	10.7	8.3	10.5	11.1	10.9	8.7	9.3
26217	3.5	5.8	4.5	4.7	6.1	9.0	5.4	5.7	6.1	6.8	6.1	6.3
26218	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26219	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26127	6.6	9.3	7.5	8.1	8.3	12.2	7.5	9.3	11.2	10.5	7.5	9.3
26128	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26129	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26130	2.2	3.3	2.4	2.7	2.8	3.0	2.6	3.2	3.0	3.2	2.5	3.0
26131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26132	0.6	1.0	0.7	0.8	0.8	1.3	0.7	0.9	1.1	1.1	0.7	1.0
26133	0.4	0.6	0.4	0.5	0.5	1.0	0.4	0.6	1.0	0.7	0.4	0.6
26134	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26135	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26136	1.5	2.8	1.3	1.8	1.5	2.3	1.4	1.9	2.7	2.5	1.6	1.8
26137	1.5	2.1	1.3	1.9	1.6	1.4	1.4	1.4	1.3	1.1	1.1	1.1
26138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26227	6.5	9.3	7.9	8.1	8.3	11.7	7.6	9.3	11.8	10.2	7.7	8.8
26228	4.7	6.7	4.5	6.6	5.8	8.1	4.8	6.6	8.7	7.6	5.3	6.7

TABLE C15 - TEST DATA FOR TEST 3 ON SECTION 6

REDUCED RAIL DATA

		TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE	-MILLIONTHS	36101	-107.3	-99.3	-103.9	-74.2	-98.2	-99.3	-109.6	-68.5	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE	-MILLIONTHS	36102	25.6	32.6	26.7	31.4	25.6	33.7	30.2	34.9	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE	-MILLIONTHS	36103	164.4	153.0	157.6	123.3	146.1	149.6	158.7	123.3	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE	-MILLIONTHS	36104	-117.6	-72.6	-104.9	-66.9	-102.6	-108.4	-91.1	-65.7	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE	-MILLIONTHS	36105	-16.6	-14.4	-19.9	-5.5	-12.2	-16.6	-18.8	-16.6	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE	-MILLIONTHS	36106	126.9	138.6	136.3	117.6	131.6	142.1	145.6	92.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE	-MILLIONTHS	36107	-100.5	-96.8	-146.1	-82.2	-116.5	-86.8	-98.2	-93.6	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE	-MILLIONTHS	36108	-42.9	-31.6	-45.2	-31.6	-28.3	-20.3	-23.7	-21.4	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE	-MILLIONTHS	36109	150.2	121.1	135.1	108.1	135.1	137.4	135.1	111.8	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE	-MILLIONTHS	36110	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE	-MILLIONTHS	36111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE	-MILLIONTHS	36112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE	-MILLIONTHS	36113	-229.7	-252.4	-212.8	-212.8	-221.8	-249.0	-219.6	-226.3	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE	-MILLIONTHS	36114	58.8	67.9	58.8	63.3	67.9	81.5	52.0	67.9	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE	-MILLIONTHS	36115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE	-MILLIONTHS	36116	106.4	106.4	119.9	99.6	122.2	104.1	129.0	104.1	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE	-MILLIONTHS	36117	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE	-MILLIONTHS	36118	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE	-MILLIONTHS	36119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE	-MILLIONTHS	36120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE	-MILLIONTHS	36121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE	-MILLIONTHS	36122	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE	-INCHES	36209	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES	-INCHES	36210	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE	-PSI	36211	31.8	32.5	35.9	33.4	35.0	35.7	34.1	33.6	35.9	33.4	38.0	37.1
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE		36212	11.2	10.0	12.5	10.9	11.6	11.3	12.4	11.1	11.4	10.7	12.4	10.8
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE		36213	16.1	13.5	17.2	14.8	16.3	14.5	17.3	14.7	14.8	14.3	17.1	13.9
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE		36214	7.8	8.2	9.6	8.0	9.1	8.8	8.8	8.0	8.5	8.0	8.5	8.2
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE		36215	14.4	13.9	17.1	15.1	17.8	16.0	16.8	15.5	15.6	15.5	16.5	15.9
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE		36216	25.4	24.1	27.0	25.9	29.0	26.9	29.1	26.8	25.9	26.3	26.8	25.3
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES	-PSI	36217	21.1	21.5	23.6	22.0	22.4	23.4	22.0	22.0	23.7	21.9	24.8	22.8
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES	-PSI	36218	6.1	5.2	7.2	5.8	7.1	6.1	6.4	5.9	6.0	5.8	6.7	5.8
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES	-PSI	36219	20.4	18.2	21.3	19.1	20.5	18.9	21.4	19.3	19.2	18.4	20.5	18.6
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE	-KIPS	36127	12.7	12.7	12.4	11.3	13.3	13.2	11.9	12.7	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE	-KIPS	36128	12.2	11.7	11.2	11.7	12.4	13.1	12.2	11.7	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END	-KIPS	36129	2.3	2.3	2.2	2.0	2.3	2.3	2.1	2.2	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2	-KIPS	36130	2.3	2.4	2.5	2.1	2.7	2.6	2.3	2.3	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3	-KIPS	36131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4	-KIPS	36132	1.9	1.9	1.9	1.8	1.9	2.0	1.8	1.9	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5	-KIPS	36133	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6	-KIPS	36134	1.0	1.0	0.9	0.9	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7	-KIPS	36135	2.5	2.6	2.5	2.6	2.7	2.8	2.6	2.6	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8	-KIPS	36136	2.4	2.4	2.2	2.3	2.5	2.8	2.4	2.3	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9	-KIPS	36137	2.6	2.5	2.3	2.5	2.5	2.7	2.6	2.5	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END	-KIPS	36138	1.3	1.3	1.2	1.3	1.4	1.5	1.4	1.3	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE	-KIPS	36227	12.1	12.3	15.9	12.4	16.9	13.0	12.7	11.8	13.2	12.5	14.1	12.7
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE	-KIPS	36228	12.3	11.1	13.0	11.8	13.6	12.4	13.6	12.4	12.2	11.4	12.2	11.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END	-KIPS	36229	0.7	0.8	1.1	0.9	1.2	1.0	1.0	0.9	1.0	0.9	1.0	1.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2	-KIPS	36230	4.0	4.2	5.1	4.4	4.7	4.6	4.3	3.9	4.7	4.4	4.3	4.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3	-KIPS	36231	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4	-KIPS	36232	1.7	1.7	2.2	1.7	2.2	1.8	1.8	1.7	1.8	1.7	2.0	1.8
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5	-KIPS	36233	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6	-KIPS	36234	1.0	0.9	1.2	0.9	1.2	1.0	1.1	1.0	1.0	1.0	1.1	0.9
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7	-KIPS	36235	5.2	4.7	5.4	5.0	5.4	5.1	5.6	5.0	5.0	5.1	5.3	4.8
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8	-KIPS	36236	2.8	2.4	3.1	2.6	2.8	2.6	3.2	2.8	2.6	2.7	2.8	2.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9	-KIPS	36237	2.4	2.1	2.5	2.3	2.6	2.3	2.6	2.3	2.2	2.2	2.4	2.2
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END	-KIPS	36238	1.5	1.3	1.7	1.5	1.8	1.5	1.8	1.6	1.4	1.5	1.6	1.5
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 1	-KIPS		32.97	32.97	32.66	32.66	32.80	32.80	32.92	32.92				
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 2	-KIPS		32.35	32.35	33.28	33.28	32.35	32.35	33.28	33.28	32.35	32.35	33.28	33.28

TABLE C16 – TEST DATA FOR TEST 4 ON SECTION 6

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	46101	-84.0	-20.4	-75.4	-97.0	-22.6	-78.6	-51.7	-30.1	-73.2	-86.2	-51.2	-71.1	-53.0	-40.9	-73.2	-98.0	-19.3	-60.3
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	46102	-28.0	-15.9	-24.2	-28.2	-4.5	-26.5	-29.9	-20.3	-28.2	-35.5	-9.8	-22.6	-29.9	-14.6	-27.1	-24.2	-8.5	-28.9
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	46103	128.1	79.7	117.4	122.8	57.1	120.7	84.6	64.6	130.4	118.5	77.0	100.7	73.4	74.3	98.6	79.7	76.5	113.1
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	46104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	46105	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	46106	142.4	98.3	149.7	120.0	78.3	86.6	69.0	87.9	143.6	140.0	71.5	111.5	112.7	98.2	139.4	122.9	89.1	118.2
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	46107	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	46108	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	46109	137.0	105.0	154.0	149.7	97.1	155.9	127.7	103.9	150.2	149.7	119.7	154.8	116.9	104.9	154.2	150.8	110.6	155.3
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	46118	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	46119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	46120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	46110	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	46111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	46112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	46113	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	46114	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	46121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	46122	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	46123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	46124	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	46125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	46201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	46202	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	46205	16.0	18.7	17.8	16.2	18.7	18.7	16.6	19.7	19.3	16.5	19.3	18.0	16.2	19.4	21.0	16.7	20.8	17.7
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	46206	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	46207	22.0	24.2	24.5	22.2	25.4	23.7	21.4	25.2	25.4	23.9	25.3	25.3	22.9	25.4	26.2	23.4	25.7	21.8
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	46208	10.5	13.7	12.9	11.1	13.2	13.0	11.8	14.3	13.7	11.8	14.0	12.5	11.4	14.0	15.5	11.1	15.2	11.7
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	46209	0.7	0.9	0.6	0.5	1.0	0.5	0.6	1.2	0.7	0.5	1.0	0.7	0.5	0.9	1.1	0.4	1.3	0.2
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	46210	13.6	17.7	18.2	14.8	18.9	16.0	14.6	18.2	19.4	16.0	18.4	18.9	15.5	10.0	19.9	14.6	19.4	15.3
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	46211	22.5	26.2	27.7	23.0	24.9	29.1	23.7	27.2	27.7	21.8	27.0	29.6	23.0	20.9	34.3	23.9	32.4	27.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	46212	1.3	1.6	1.2	1.0	1.6	1.6	1.3	2.8	2.2	2.0	2.0	2.0	1.9	2.0	2.2	1.7	2.0	1.0
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	46213	16.7	19.5	19.7	17.0	20.1	18.7	16.2	19.7	28.4	17.6	19.7	19.7	17.6	19.5	20.1	16.7	19.6	17.1
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	46127	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	46128	5.7	9.0	10.0	5.7	10.3	7.9	6.2	9.8	10.9	5.9	7.9	7.9	7.5	10.9	9.8	7.5	11.2	10.9
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	46129	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	46130	4.3	5.5	4.5	4.9	5.5	5.5	4.1	5.3	5.3	4.3	4.7	4.5	4.3	4.7	4.7	3.5	4.0	4.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	46131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	46132	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	46133	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	46134	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	46135	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	46136	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	46137	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	46138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 1 -KIPS		32.75	32.75	32.75	32.50	32.50	32.50	32.75	32.75	32.75	32.50	32.50	32.50	32.75	32.75	32.75	32.50	32.50	32.50
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 2 -KIPS		32.75	32.75	32.75	32.50	32.50	32.50	32.75	32.75	32.75	32.50	32.50	32.5	32.75	32.75	32.75	32.50	32.50	32.50

TABLE C17 - TEST DATA FOR TEST 1 ON SECTION 8

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	18101	-167.8	-163.3	-159.7	-153.0	-145.0	-147.3	-139.3	-101.6	-102.7	-133.6	-145.0	-124.4
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	18102	63.0	33.2	53.4	53.4	52.3	59.4	63.0	48.7	57.0	74.8	45.1	57.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	18103	196.5	188.2	189.4	182.3	169.4	187.1	158.8	137.6	154.1	177.6	152.9	156.5
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	18104	-244.8	-225.8	-223.4	-213.9	-225.8	-199.7	-218.7	-185.4	-197.3	-218.7	-209.2	-218.7
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	18105	65.4	59.9	51.0	71.0	46.6	49.9	64.3	65.4	64.3	56.5	62.1	69.8
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	18106	247.8	244.1	249.1	249.1	224.0	223.0	234.2	224.3	211.9	223.0	240.4	242.9
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	18107	-200.9	-197.3	-193.7	-177.1	-164.0	-178.3	-158.1	-115.3	-131.9	-161.6	-165.2	-149.7
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	18108	39.6	39.6	38.4	41.9	43.1	45.4	32.6	44.2	52.4	51.2	31.4	43.1
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	18109	209.7	202.3	203.5	193.7	179.0	182.7	166.7	163.0	163.0	185.1	163.0	170.4
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	18110	-177.0	-166.5	-167.7	-153.7	-164.2	-138.6	-151.4	-117.6	-119.9	-129.3	-144.4	-130.4
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	18111	44.2	46.6	47.7	45.4	47.7	55.9	46.6	46.6	50.0	54.7	47.7	47.7
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	18112	186.1	181.3	188.5	172.9	178.5	166.9	163.3	132.1	141.7	165.7	168.1	165.7
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	18113	-268.9	-274.5	-274.5	-252.1	-274.5	-313.8	-235.3	-257.7	-268.9	-291.4	-212.9	-252.1
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	18114	107.5	113.2	107.5	101.8	113.2	113.2	79.2	90.5	101.8	107.5	90.5	84.9
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	18115	372.6	405.6	349.0	363.1	372.6	183.9	325.4	330.1	382.0	410.3	301.8	330.1
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	18116	90.5	113.2	113.2	124.5	124.5	124.5	45.2	56.6	79.2	90.5	56.6	67.9
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	18118	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	18119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	18123	14.7	12.7	15.7	11.8	15.7	14.7	12.7	12.7	15.7	12.7	14.7	14.7
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	18125	74.3	75.4	73.2	67.6	95.4	94.3	74.3	76.5	75.4	76.5	76.5	77.6
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	18126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	18124	-40.1	-37.0	-39.1	-38.0	-33.9	-33.9	-32.9	-32.9	-33.9	-34.9	-24.6	-24.6
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	18209	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	18210	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	18211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	18212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	18213	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	18214	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	18215	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	18216	4.9	5.3	5.5	5.7	5.7	5.9	5.8	6.5	6.5	6.3	6.0	6.9
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	18217	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	18218	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	18219	0.8	0.7	0.7	0.4	0.9	1.0	0.9	1.0	1.0	1.0	0.8	0.9
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	18127	9.6	9.9	9.2	8.9	10.8	10.7	8.1	8.8	9.5	10.0	7.8	8.8
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	18128	4.9	5.2	4.9	5.4	5.4	5.6	6.3	6.2	6.2	6.1	6.2	7.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	18329	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	18330	1.4	1.5	1.4	1.3	1.4	1.5	1.2	1.2	1.3	1.4	1.2	1.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	18331	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	18332	0.9	1.0	1.0	0.9	1.0	1.1	0.8	1.0	1.0	1.0	0.8	1.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	18333	0.7	0.8	0.7	0.6	0.7	0.9	0.6	0.7	0.7	0.8	0.6	0.8
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	18334	0.6	0.7	0.6	0.6	0.5	0.8	0.4	0.6	0.7	0.8	0.5	0.6
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	18335	1.3	1.4	1.3	1.4	1.3	1.4	1.5	1.5	1.4	1.6	1.3	1.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	18336	1.7	1.8	1.8	1.9	1.7	2.0	1.9	2.1	2.0	2.2	1.9	2.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	18337	1.7	1.9	1.9	2.0	1.7	2.0	2.0	2.2	2.0	2.1	2.0	2.2
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	18338	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE C18 - TEST DATA FOR TEST 2 ON SECTION 8

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	28101	-150.7	-146.1	-154.1	-137.0	-125.6	-124.4	-124.4	-95.9	-86.8	-108.5	-133.6	-111.9
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	28102	53.4	59.4	58.2	39.2	80.8	122.4	45.1	68.9	68.9	68.9	55.8	59.4
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	28103	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	28104	-221.1	-225.8	-225.8	-204.4	-221.1	-202.0	-185.4	-180.6	-137.8	-175.9	-171.1	-183.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	28105	61.0	63.2	62.1	75.4	61.0	95.4	54.3	75.4	63.2	78.7	98.7	72.1
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	28106	236.7	231.7	230.5	236.7	271.4	294.9	292.4	270.1	286.2	271.4	301.1	285.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	28107	-190.2	-213.9	-191.3	-178.3	-160.4	-175.9	-146.2	-145.0	-135.5	-149.7	-159.2	-130.7
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	28108	24.4	26.7	24.7	32.6	32.6	36.1	26.7	38.4	40.7	34.9	25.6	32.6
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	28109	203.5	202.3	204.7	197.4	177.8	188.8	166.7	154.5	170.4	177.8	175.3	166.7
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	28110	-159.6	-146.7	-157.2	-194.4	-135.1	-116.5	-139.8	-121.1	-110.6	-116.5	-135.1	-124.6
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	28111	31.4	27.9	38.4	36.1	30.2	36.1	41.9	38.4	38.4	41.9	33.7	38.4
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	28112	184.8	176.4	171.6	159.6	154.8	145.2	160.8	138.0	104.4	150.0	171.6	172.8
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	28113	-285.8	-274.5	-263.3	-285.8	-246.5	-336.2	-207.3	-252.1	-246.5	-252.1	-246.5	-257.7
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	28114	107.5	135.8	107.5	107.5	113.2	158.4	101.8	135.8	135.8	124.5	119.8	113.2
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	28115	377.3	382.0	363.1	344.3	353.7	448.0	306.5	382.0	377.3	363.1	334.8	334.8
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	28116	113.2	135.8	113.2	113.2	101.8	124.5	101.8	113.2	124.5	135.8	113.2	124.5
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	28118	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	28119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	28123	14.7	14.7	14.7	13.7	15.7	14.7	15.7	15.7	13.7	14.7	15.7	14.7
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	28125	71.0	68.8	69.9	66.5	72.1	74.3	72.1	81.0	71.0	68.8	77.6	79.9
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	28126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	28124	-41.1	-40.1	-39.1	-38.0	-33.9	-36.0	-36.0	-32.9	-31.9	-33.9	-31.9	-52.9
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	28209	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	28210	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	28211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	28212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	28213	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	28214	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	28215	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	28216	3.9	4.4	3.8	4.5	4.4	4.7	4.6	5.3	5.4	5.3	4.8	6.0
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	28217	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	28218	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	28219	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.7	0.7	0.7	0.5	0.6
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	28127	11.1	11.9	10.9	11.6	13.3	13.6	12.1	11.2	13.0	12.4	12.6	13.4
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	28128	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	28329	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	28330	4.3	4.2	3.6	3.6	3.8	4.1	4.1	3.6	4.6	4.1	3.6	3.9
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	28331	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	28332	1.1	1.1	1.0	1.0	1.0	1.2	0.9	0.9	1.0	1.2	0.9	1.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	28333	0.9	0.9	0.9	0.9	0.9	1.1	1.0	0.9	1.2	1.2	0.8	1.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	28334	0.8	0.7	0.7	0.7	0.7	0.9	0.9	0.8	0.9	1.0	0.8	0.9
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	28335	1.5	1.7	1.4	1.8	1.7	1.7	1.7	1.7	1.8	1.9	1.7	2.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	28336	1.9	2.1	1.6	2.2	1.8	2.5	2.0	2.2	2.3	2.3	1.9	2.9
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	28337	1.9	2.2	1.6	2.2	1.9	2.3	1.9	2.3	2.3	2.3	1.8	3.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	28338	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE C19 - TEST DATA FOR TEST 3 ON SECTION 8

REDUCED HAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	38101	-125.8	-118.8	-132.8	-132.8	-125.8	-128.1	-130.4	-128.1	-130.4	-128.1	-128.1	-132.8
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	38102	18.4	29.9	20.7	29.9	18.4	29.9	18.4	25.3	23.0	23.0	20.7	29.9
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	38103	170.0	184.0	181.7	186.4	167.7	174.7	177.0	170.0	170.0	174.7	174.7	179.4
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	38104	-177.0	-181.7	-191.0	-163.1	-172.4	-172.4	-167.7	-163.1	-167.7	-167.7	-172.4	-149.1
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	38105	34.2	39.9	51.3	22.8	51.3	22.8	39.9	39.9	45.6	28.5	22.8	45.6
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	38106	204.7	202.4	202.4	214.1	207.1	209.4	223.5	207.1	211.8	211.8	218.8	190.6
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	38107	-151.4	-179.4	-181.7	-158.4	-146.7	-149.1	-163.1	-167.7	-151.4	-151.4	-158.4	-149.1
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	38108	-35.3	-35.3	-35.3	-32.9	-28.2	-35.3	-47.0	-28.2	-32.9	-32.9	-44.7	-28.2
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	38109	163.7	149.9	170.7	159.1	163.7	147.6	161.4	163.7	161.4	159.1	149.9	166.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	38110	-116.5	-97.8	-116.5	-111.8	-118.8	-109.5	-118.8	-104.8	-118.8	-111.8	-114.1	-114.1
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	38111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	38112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	38113	-49.2	-56.6	-62.2	-62.2	-56.6	-56.6	-56.6	-62.2	-50.9	-62.2	-62.2	-62.2
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	38114	28.3	28.3	33.9	33.9	28.3	33.9	33.9	28.3	28.3	28.3	28.3	33.9
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	38115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	38116	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	38117	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	38118	-89.3	-83.4	-89.3	-83.4	-83.4	-89.3	-77.4	-83.4	-77.4	-83.4	-83.4	-89.3
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	38119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	38120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	38121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	38122	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	38209	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	38210	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	38211	11.6	11.3	12.1	11.8	11.4	11.0	11.6	13.6	11.0	11.8	12.5	12.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	38212	10.9	11.3	11.2	12.0	11.2	12.8	11.9	12.5	10.2	13.0	12.1	12.1
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	38213	17.2	18.6	17.2	18.1	18.9	20.2	19.5	17.1	17.8	20.7	18.5	18.8
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	38214	22.2	21.9	23.6	21.5	21.6	21.4	22.1	23.8	19.8	23.9	23.1	23.8
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	38215	15.5	16.6	16.4	16.5	15.6	16.9	16.3	15.7	14.1	18.4	16.6	17.4
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	38216	5.0	5.4	5.0	5.0	4.9	5.1	4.9	3.5	4.7	5.8	4.9	4.8
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	38217	16.7	16.5	17.2	17.2	15.8	16.2	16.3	19.1	14.7	17.5	17.2	17.9
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	38218	7.6	8.2	8.4	8.3	7.9	8.6	8.4	8.1	7.6	9.9	8.8	9.5
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	38219	15.9	17.3	17.1	17.5	16.9	19.1	17.6	14.8	16.7	19.3	17.6	18.2
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	38127	8.5	8.9	9.1	8.4	8.1	8.8	8.6	8.6	8.3	8.7	8.9	9.1
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	38128	12.8	12.9	14.1	12.6	13.9	13.3	13.8	12.5	14.2	13.4	13.1	12.8
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	38129	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	38130	4.0	4.1	4.0	4.0	3.9	3.9	3.9	3.8	3.6	3.8	3.9	4.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	38131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	38132	2.7	3.7	5.0	5.1	3.0	3.2	5.0	4.9	3.2	3.3	3.2	3.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	38133	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	38134	1.2	1.3	1.4	1.3	1.2	1.4	1.4	1.3	1.3	1.4	1.5	1.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	38135	3.6	3.5	4.0	3.8	3.8	3.8	4.0	3.8	4.0	4.0	3.9	4.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	38136	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	38137	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	38138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	38227	8.1	7.8	8.4	7.7	7.7	7.7	7.9	9.4	6.5	8.4	8.4	8.6
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	38228	13.5	14.9	13.5	14.6	14.2	16.4	14.3	11.4	13.6	15.7	14.0	14.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	38229	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	38230	4.1	4.0	4.2	3.9	3.9	3.6	3.9	4.4	3.6	4.2	4.2	4.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	38231	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	38232	3.3	3.5	3.5	3.7	3.4	3.5	3.5	3.7	3.2	4.0	3.1	3.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	38233	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.5	0.4	0.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	38234	1.1	1.2	1.2	1.2	1.1	1.3	1.2	1.0	1.0	1.4	1.2	1.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	38235	3.3	3.5	3.4	3.5	3.3	3.5	3.3	2.8	3.3	3.7	3.2	3.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	38236	2.6	2.9	2.7	3.0	2.7	3.8	2.7	2.1	2.6	3.1	2.4	2.9
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	38237	2.7	2.9	2.6	2.8	2.7	3.2	2.7	2.2	2.5	3.2	2.7	2.8
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	38238	3.5	4.0	3.5	3.9	3.8	4.4	3.8	3.0	3.8	4.2	3.8	3.9
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMRER 1 -KIPS		32.97	32.97	32.66	32.66	32.97	32.97	32.66	32.66	32.97	32.97	32.66	32.66
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMRER 2 -KIPS		32.35	32.35	33.28	33.28	33.40	33.40	32.85	32.85	33.14	33.14	33.36	33.36

TABLE C20 - TEST DATA FOR TEST 4 ON SECTION 8

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	48101	-98.1	-60.4	-76.4	-90.1	-68.4	-77.6	-85.5	-54.7	-85.5	-85.5	-65.0	-90.1	-97.0	-76.4	-104.9	-87.8	-66.1	-87.8
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	48102	31.4	41.3	40.7	34.9	43.6	-43.6	26.1	30.8	26.7	27.9	30.8	29.6	26.1	38.9	44.8	26.1	36.0	42.4
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	48103	145.7	121.6	135.2	149.3	111.6	158.1	131.6	119.9	131.6	168.1	121.6	154.6	134.0	105.8	141.0	121.1	104.6	136.3
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	48104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	48105	14.2	26.7	27.3	15.4	24.9	26.1	9.5	19.0	20.1	9.5	18.4	20.1	12.4	26.1	19.5	13.0	27.9	21.3
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	48106	106.3	104.5	107.4	105.7	106.3	106.8	106.3	104.5	106.8	106.8	106.8	107.4	105.1	105.7	108.0	107.4	105.7	106.8
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	48107	-96.0	-91.9	-122.2	-103.5	-101.2	-120.4	-109.4	-75.6	-104.7	-119.8	-91.9	-107.0	-111.7	-94.2	-129.2	-94.8	-100.1	-105.9
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	48108	5.8	9.4	7.0	4.7	8.8	12.9	5.8	11.1	5.8	11.7	11.1	8.2	6.4	6.4	7.0	9.9	13.5	14.1
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	48109	122.1	108.9	124.4	123.8	101.4	148.6	114.0	101.9	111.7	127.9	104.8	123.3	122.7	110.6	148.6	126.1	119.2	142.3
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	48118	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	48119	-20.6	-17.9	-28.5	-24.3	-17.9	-29.6	-15.8	-17.4	-22.7	-23.2	-17.9	-28.5	-24.3	-17.9	-32.2	-16.4	-19.5	-29.1
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	48120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	48110	-87.8	-97.2	-99.0	-94.3	-95.5	-109.6	-80.1	-90.7	-93.7	-103.7	-93.1	-110.8	-89.0	-97.8	-109.6	-79.5	-91.9	-97.8
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	48111	27.1	26.0	27.1	27.7	24.3	27.7	21.5	24.9	19.8	29.9	25.4	31.1	26.6	28.8	31.6	28.3	28.3	32.2
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	48112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	48113	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	48114	-68.4	-66.2	-66.2	-70.1	-61.6	-65.8	-62.8	-59.9	-61.1	-66.7	-59.9	-59.9	-60.5	-68.5	-61.1	-61.1	-59.9	-55.4
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	48121	-47.4	-49.7	-58.3	-56.8	-53.1	-61.1	-44.5	-49.1	-49.1	-48.5	-53.7	-65.1	-48.0	-56.0	-57.1	-49.0	-52.5	-60.6
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	48122	8.9	11.3	13.7	10.7	11.9	12.5	10.1	13.1	13.1	10.7	11.9	13.1	11.9	13.1	14.2	10.7	12.5	16.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	48123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	48124	59.1	56.0	57.6	57.6	54.0	57.6	54.5	54.0	57.6	57.1	55.5	56.0	53.5	57.1	57.6	61.2	55.0	55.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	48125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	48201	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	48202	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	48205	8.1	9.0	10.8	10.1	8.4	9.3	9.0	8.4	8.6	9.5	9.1	8.2	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	48206	16.5	19.1	18.5	18.4	18.1	19.6	18.7	17.8	17.4	19.0	19.1	19.1	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	48207	10.5	12.0	10.8	10.8	10.8	12.5	11.6	11.6	11.5	10.4	11.0	13.2	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	48208	8.2	9.8	9.6	9.4	8.8	10.0	8.2	8.4	8.4	10.8	8.6	7.9	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	48209	11.7	14.0	13.1	13.6	12.6	14.5	13.2	13.5	12.7	14.6	12.8	14.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	48210	15.7	18.5	16.9	17.3	16.9	18.5	17.5	17.7	16.6	17.7	17.1	19.4	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	48211	12.6	14.8	15.2	15.1	13.9	15.5	14.1	13.6	13.9	15.3	14.1	14.8	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	48212	17.8	20.4	20.4	20.4	19.6	21.4	20.3	19.8	19.4	20.1	19.7	20.1	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	48213	13.9	16.1	15.7	15.9	15.1	16.7	16.1	15.3	15.1	14.9	15.2	16.2	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	48127	16.0	14.4	14.6	14.8	14.6	16.6	12.8	13.1	14.6	14.4	14.8	15.8	13.8	14.8	17.4	13.6	14.8	14.8
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	48128	16.4	14.1	14.5	14.5	14.5	15.0	14.3	16.2	15.8	13.9	14.3	14.7	12.3	15.4	16.4	10.0	14.1	14.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	48129	0.5	0.5	0.5	0.6	0.6	0.9	0.7	0.7	0.7	0.9	0.9	0.9	0.9	1.0	1.0	0.9	1.0	1.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	48130	3.4	2.9	2.9	3.0	2.9	3.4	2.6	2.9	2.9	3.0	3.0	3.1	2.8	3.0	3.5	2.7	3.0	3.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	48131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	48132	5.4	3.5	3.6	3.5	3.5	3.4	3.1	3.5	3.5	3.5	3.5	3.9	3.2	3.6	4.1	3.6	3.6	3.6
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	48133	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	48134	2.1	1.9	2.1	2.0	2.0	2.2	1.8	2.1	2.1	1.9	1.9	2.0	1.8	2.0	2.3	2.2	2.0	2.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	48135	3.2	3.1	3.1	3.1	3.2	3.3	3.0	3.3	3.3	2.9	3.1	3.1	2.7	3.2	3.6	3.6	3.1	3.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	48136	2.9	2.7	2.9	2.8	2.9	3.1	2.6	3.1	3.1	2.6	2.8	2.9	2.3	3.0	3.4	3.4	2.8	2.9
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	48137	3.1	3.0	3.1	3.1	3.1	3.0	2.5	2.2	2.9	2.5	2.5	2.6	2.1	2.7	3.0	3.0	2.5	2.6
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	48138	2.9	2.7	2.9	2.9	2.9	2.8	2.9	3.2	3.1	2.7	2.8	2.9	2.4	3.1	3.1	3.5	2.6	2.7
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	48227	15.3	17.0	17.2	17.5	15.9	17.5	15.5	15.5	15.5	17.2	15.5	15.2	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	48228	11.9	13.5	12.3	14.9	13.5	14.3	13.5	13.7	13.3	12.5	13.3	16.8	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	48229	2.2	2.3	2.3	1.4	1.2	1.7	1.4	1.5	1.4	2.3	1.7	1.9	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	48230	3.4	3.4	3.6	4.8	3.4	3.7	3.4	3.3	3.2	4.6	3.3	3.8	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	48231	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	48232	4.6	4.8	4.6	3.6	4.6	5.0	4.6	4.6	4.2	5.7	4.6	5.1	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	48233	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	48234	2.1	2.3	2.2	2.3	2.2	2.4	2.2	2.3	2.1	2.5	2.2	2.3	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	48235	2.7	3.1	3.0	3.1	3.1	3.2	3.2	3.1	3.0	3.2	2.9	3.3	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	48236	2.3	2.8	2.6	2.4	2.8	3.1	3.2	3.3	3.2	3.2	3.3	3.4	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	48237	2.2	2.6	2.3	2.7	2.5	2.7	2.6	2.7	2.5	2.4	2.6	2.7	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	48238	2.4	2.6	2.4	3.0	2.7	2.9	2.8	3.1	2.7	2.5	2.6	4.0	0.0	0.0	0.0	0.0	0.0	0.0
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 1 -KIPS		32.70	32.70	32.70	32.55	32.55	32.55	33.30	33.30	33.30	32.62	32.62	32.62	32.75	32.75	32.75	32.50	32.50	32.50
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 2 -KIPS		32.97	32.97	32.66	32.66	32.97	32.97	32.66	32.66	33.00	33.00	33.24	33.24						

TABLE C21 - TEST DATA FOR TEST 1 ON SECTION 9

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	19201	-174.7	-161.9	-164.2	-131.6	-118.8	-116.5	-142.1	-89.7	-79.2	-125.8	-159.6	-123.4
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	19202	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	19203	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	19204	-103.7	-106.9	-110.1	-101.6	-92.1	-91.0	-94.2	-79.4	-74.1	-90.0	-96.3	-90.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	19205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	19206	187.2	180.9	185.1	176.8	161.2	152.9	169.5	132.1	131.0	157.8	171.6	159.1
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	19207	-200.3	-188.7	-192.2	-167.7	-142.1	-174.7	-161.9	-118.8	-108.3	-163.1	-175.9	-151.4
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	19208	31.4	33.7	39.6	39.6	40.7	40.7	30.2	36.1	39.6	46.6	41.9	41.9
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	19209	200.3	198.0	207.3	164.9	147.9	184.0	165.4	113.0	108.3	171.2	167.7	158.4
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	19210	-210.8	-201.5	-201.5	-175.9	-160.7	-196.8	-157.2	-117.6	-115.3	-181.7	-151.4	-156.1
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	19211	46.3	43.9	47.5	46.3	51.1	45.1	47.5	47.5	63.0	57.0	45.1	39.2
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	19212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	19213	-136.8	-144.0	-139.9	-131.7	-149.2	-170.8	-142.0	-157.4	-155.3	-157.4	-169.7	-157.4
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	19214	21.9	24.3	21.9	19.4	24.5	34.0	24.3	25.5	27.9	25.5	27.9	25.5
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	19215	187.9	190.1	182.2	159.6	185.6	200.2	176.5	192.2	179.9	181.1	195.8	182.2
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	19216	159.6	159.6	157.3	144.8	148.2	157.3	159.6	147.1	147.1	146.0	156.2	148.2
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	19217	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	19218	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	19222	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	19223	35.0	26.0	24.9	27.1	27.1	23.7	23.7	24.9	26.0	26.0	26.0	23.7
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	19224	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	19225	-154.0	-155.0	-164.1	-150.5	-150.5	-131.3	-160.7	-141.4	-141.4	-131.3	-163.0	-141.4
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	19123	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	19124	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	19114	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	19115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	19116	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	19117	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	19118	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	19119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	19120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	19121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	19122	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	19127	9.4	10.0	8.9	8.5	9.8	11.2	9.1	10.4	9.9	10.3	9.5	10.3
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	19128	8.3	8.8	8.1	8.9	9.3	9.7	8.5	9.5	10.7	10.0	8.3	9.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	19129	2.0	2.1	2.1	2.0	2.2	2.2	2.4	2.2	2.1	2.3	2.2	2.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	19130	2.6	2.7	2.6	2.5	2.7	2.9	2.7	2.7	2.6	2.8	2.7	2.7
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	19131	2.8	3.0	2.8	2.7	3.0	3.7	2.9	3.5	3.2	3.4	3.1	3.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	19132	0.8	1.0	0.9	0.8	1.0	1.3	1.0	1.2	1.1	1.2	1.0	1.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	19133	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	19134	1.5	1.7	1.5	1.5	1.8	2.1	1.6	2.0	2.0	2.0	1.7	2.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	19135	1.9	1.9	1.9	1.9	2.1	2.1	1.9	2.1	2.2	2.1	1.9	2.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	19136	2.4	2.5	2.3	2.6	2.8	2.9	2.4	2.8	3.2	3.0	2.4	2.9
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	19137	2.2	2.4	2.2	2.4	2.4	2.5	2.2	2.6	2.8	2.6	2.2	2.5
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	19138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE C22 - TEST DATA FOR TEST 2 ON SECTION 9

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	29201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	29202	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	29203	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	29204	-90.0	-84.7	-98.4	-74.1	-50.8	-69.9	-68.8	-47.6	-56.1	-66.7	-61.4	-56.1
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	29205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	29206	152.8	153.6	159.4	148.7	82.6	132.1	134.6	57.8	103.2	99.1	104.1	121.4
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	29207	-184.0	-182.9	-184.0	-170.0	-144.4	-160.7	-164.2	-117.6	-121.1	-145.6	-168.9	-146.7
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	29208	-44.2	-40.7	-44.2	-38.4	-34.9	-34.9	-38.4	-29.1	-30.2	-32.6	-26.7	-23.3
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	29209	163.1	166.5	172.4	151.4	146.7	166.5	163.1	137.4	125.8	160.7	170.0	163.1
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	29210	-182.9	-189.8	-180.5	-157.2	-147.9	-180.5	-133.9	-97.8	-100.1	-159.6	-130.4	-135.1
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	29211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	29212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	29213	-140.9	-154.3	-143.0	-131.7	-164.6	-171.8	-164.6	-174.9	-170.8	-169.8	-165.6	-166.7
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	29214	23.1	29.2	25.5	15.8	31.6	31.6	29.2	37.7	37.7	25.5	29.2	27.9
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	29215	204.8	224.1	224.1	178.8	234.3	249.0	227.5	245.6	252.4	227.5	234.3	226.3
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	29216	183.3	200.3	183.3	172.0	184.3	207.1	178.8	176.5	174.3	183.3	186.7	187.9
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	29217	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	29218	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	29222	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	29223	10.1	15.4	11.3	12.4	16.9	16.9	18.1	12.4	16.9	18.1	12.4	15.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	29224	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	29225	-244.7	-218.4	-226.3	-210.5	-201.4	-186.7	-202.6	-181.1	-182.2	-167.5	-212.8	-181.1
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	29123	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	29124	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	29114	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	29115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	29116	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	29117	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	29118	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	29119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	29120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	29121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	29122	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	29127	8.8	9.8	9.3	9.3	11.2	11.4	10.7	12.1	12.4	10.6	11.2	12.7
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	29128	8.9	8.6	8.0	8.4	8.6	11.3	7.2	7.9	9.7	10.9	7.3	9.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	29129	2.0	2.1	2.1	2.1	2.4	2.5	2.6	2.5	2.5	2.4	2.5	2.7
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	29130	2.5	2.7	2.7	2.6	3.0	2.7	3.1	3.1	3.4	3.3	3.1	3.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	29131	2.9	3.1	3.1	3.0	3.6	3.4	3.3	4.0	3.5	3.3	3.5	3.7
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	29132	0.8	1.0	0.9	0.9	1.2	1.5	1.1	1.4	1.5	1.3	1.2	1.5
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	29133	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	29134	1.5	1.6	1.5	1.4	1.9	2.7	1.5	1.9	2.2	2.1	1.6	2.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	29135	1.9	1.9	1.8	1.9	2.0	2.1	1.8	2.0	2.2	2.3	1.9	2.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	29136	2.5	2.4	2.3	2.4	2.6	2.9	2.0	2.3	2.8	3.2	2.1	2.3
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	29137	2.3	2.3	2.1	2.2	2.2	2.2	1.8	2.0	2.3	2.1	1.7	2.1
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	29138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE C23 - TEST DATA FOR TEST 3 ON SECTION 9

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	39101	-215.5	-198.0	-206.2	-193.3	-185.2	-189.8	-191.0	-164.2	-193.3	-177.0	-196.8	-180.5	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	39102	-38.0	-33.2	-34.4	-30.9	-28.5	-28.5	-26.1	-24.9	-27.3	-28.5	-29.7	-27.3	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	39103	223.7	223.7	218.0	224.9	218.5	219.1	211.0	201.8	215.6	209.9	227.2	211.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	39104	-173.0	-159.1	-159.1	-143.0	-159.1	-136.1	-161.4	-147.6	-168.4	-140.7	-159.1	-147.6	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	39105	22.4	44.8	44.8	33.6	44.8	22.4	50.4	33.6	39.2	44.8	44.8	44.8	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	39106	228.4	211.2	199.8	199.8	211.2	217.0	217.0	245.5	234.1	217.0	222.7	217.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	39107	-219.0	-208.5	-213.1	-202.7	-201.5	-192.2	-195.7	-173.5	-193.3	-184.0	-195.7	-177.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	39108	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	39109	228.3	238.8	231.8	242.5	220.1	245.8	227.1	217.8	238.8	228.3	246.9	239.9	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	39110	-139.8	-138.6	-133.9	-132.8	-124.6	-135.1	-126.9	-115.3	-130.4	-123.4	-144.4	-113.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	39111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	39112	173.5	171.2	153.7	157.2	149.1	179.4	157.2	138.6	159.6	171.2	180.5	147.9	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	39113	-181.1	-175.4	-147.1	-152.8	-124.5	-164.1	-141.5	-135.8	-130.1	-141.5	-141.5	-152.8	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	39114	21.5	23.7	23.7	24.9	13.5	20.3	15.8	14.7	16.9	15.8	20.3	16.9	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	39115	109.9	116.4	108.3	116.4	98.6	113.1	101.8	100.2	106.7	109.9	108.3	108.3	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	39116	78.1	87.1	80.3	84.9	70.1	81.5	75.8	58.2	78.1	80.3	89.4	83.7	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	39117	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	39118	-215.0	-215.0	-203.7	-215.0	-215.0	-226.4	-215.0	-192.4	-203.7	-215.0	-215.0	-203.7	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	39119	89.8	88.7	85.4	89.8	88.7	96.5	82.1	81.0	88.7	87.6	100.9	84.3	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	39120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	39121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	39122	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	39209	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	39210	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	39211	12.0	13.3	13.3	12.3	13.7	13.4	11.7	13.7	16.7	14.0	11.5	14.0	11.0	12.7	14.2	10.9	12.6	12.9
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	39212	14.0	16.2	16.0	14.3	16.7	16.5	15.1	16.0	20.0	17.3	14.1	16.7	15.4	16.0	18.1	14.6	16.5	16.7
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	39213	23.5	26.9	26.0	22.6	26.9	26.7	26.0	25.2	29.7	27.8	23.0	27.0	25.5	26.1	28.3	24.8	26.9	26.9
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	39214	18.4	20.8	21.9	19.4	21.6	21.9	18.4	22.7	24.4	24.4	17.6	23.3	18.6	21.1	23.7	18.2	20.8	21.5
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	39215	18.2	19.5	19.8	18.1	19.7	19.9	18.9	19.7	20.3	20.0	17.9	19.7	19.8	19.8	20.3	18.7	19.8	19.8
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	39216	24.2	28.1	28.1	21.8	24.5	28.4	28.0	28.0	31.3	32.2	20.4	26.8	26.3	29.0	30.5	27.1	29.6	28.9
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	39217	13.6	16.2	16.6	14.7	16.8	16.5	13.9	16.8	19.9	18.3	15.0	17.7	13.3	15.9	17.5	14.2	16.0	16.6
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	39218	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	39219	12.0	14.6	14.1	10.6	14.2	13.9	13.1	13.2	16.5	15.3	11.8	13.8	12.2	13.9	14.9	12.0	14.1	14.1
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	39127	10.7	13.2	11.0	14.2	9.8	13.5	10.4	11.5	11.2	12.1	11.5	12.5	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	39128	9.8	11.4	9.4	10.9	10.1	16.7	10.2	11.9	11.0	11.7	8.7	12.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	39129	2.4	3.0	2.4	2.9	2.3	2.9	2.4	2.6	2.4	2.5	2.7	2.9	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	39130	1.7	2.2	1.7	2.2	1.6	2.3	1.7	2.0	1.8	1.9	1.9	2.2	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	39131	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	39132	2.0	2.4	2.0	2.4	1.8	2.4	1.9	2.1	2.1	2.1	2.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	39133	0.8	1.1	0.9	1.1	0.8	1.1	0.9	1.0	0.9	1.0	0.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	39134	1.1	1.4	1.1	1.3	1.1	1.3	1.2	1.3	1.2	1.3	0.9	1.4	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	39135	1.8	2.1	1.7	2.0	1.8	2.0	1.8	2.1	2.0	2.1	1.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	39136	2.8	3.5	2.6	3.2	3.0	3.2	3.1	3.5	3.3	3.5	2.3	3.7	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	39137	1.9	2.3	1.9	2.2	2.1	2.2	2.2	2.6	2.3	2.4	1.8	2.5	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	39138	1.5	1.7	1.6	1.7	1.7	1.7	1.6	2.0	1.8	1.8	1.6	1.8	0.0	0.0	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	39227	10.5	12.2	12.6	11.2	12.5	12.5	10.3	12.4	13.7	14.1	9.6	12.5	9.9	11.2	12.7	9.6	11.1	11.8
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	39228	11.2	13.9	13.3	10.0	14.2	13.6	13.6	13.3	15.3	16.6	9.7	12.3	12.3	13.9	14.5	11.6	14.4	13.7
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	39229	2.4	2.7	2.7	2.6	2.8	2.7	2.4	2.9	3.0	3.3	2.6	3.0	2.4	3.4	3.6	2.4	2.6	2.6
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	39230	1.8	2.0	2.0	1.9	2.2	2.0	1.7	2.3	2.4	2.7	2.4	2.9	1.7	2.0	2.2	1.6	2.0	1.9
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	39231	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	39232	2.0	2.2	2.3	2.0	2.3	2.3	1.9	2.4	2.4	2.6	1.8	2.3	1.9	2.1	2.4	1.9	2.2	2.2
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	39233	0.9	1.0	1.1	0.8	1.0	1.1	0.8	1.0	1.1	1.3	0.9	1.1	0.8	1.0	1.1	0.8	1.0	1.1
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	39234	1.2	1.4	1.4	1.1	1.4	1.4	1.2	1.3	1.5	1.7	1.3	1.3	1.2	1.4	1.5	1.2	1.4	1.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	39235	1.7	2.0	2.0	1.5	2.1	2.0	1.9	1.9	2.2	2.4	1.4	1.8	1.8	2.0	2.1	1.7	2.1	2.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	39236	2.7	3.5	3.3	2.4	3.6	3.5	3.3	3.3	3.7	3.8	2.0	2.9	3.0	3.5	3.7	2.8	3.7	3.4
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	39237	2.0	2.4	2.3	1.6	2.4	2.4	2.4	2.4	2.6	3.1	1.6	2.2	2.1	2.4	2.5	1.9	2.5	2.4
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	39238	3.6	4.0	3.9	3.4	3.9	4.0	4.1	4.0	4.2	4.6	3.7	4.0	3.8	4.0	4.0	3.8	4.1	4.0
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 1 -KIPS		32.97	32.97	32.66	32.66	32.80	32.80	32.92	32.92	33.14	33.14	33.36	33.36						
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 2 -KIPS		32.80	32.80	32.80	33.04	33.04	33.04	32.80	32.80	32.80	33.04	33.04	33.04	32.80	32.80	32.80	33.84	33.04	33.04

TABLE C24 - TEST DATA FOR TEST 4 ON SECTION 9

REDUCED RAIL DATA

	TSRCH	WHEEL NUMBER 1	2	3	4	5	6	7	8	9	10	11	12
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH UPPER GAGE -MILLIONTHS	49101	-130.7	-115.1	-127.1	-115.1	-118.7	-127.1	-139.2	-112.7	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH MID GAGE -MILLIONTHS	49102	8.8	7.7	7.2	8.8	8.8	7.7	7.7	7.7	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -NORTH LOWER GAGE -MILLIONTHS	49103	82.5	71.5	78.1	76.4	72.0	78.7	75.9	77.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH UPPER GAGE -MILLIONTHS	49104	-74.8	-83.1	-96.8	-88.4	-87.8	-100.9	-91.4	-72.4	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH MID GAGE -MILLIONTHS	49105	30.2	33.7	27.3	34.3	24.4	32.0	23.2	33.1	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -AT TIE -SOUTH LOWER GAGE -MILLIONTHS	49106	80.1	76.3	82.3	83.4	76.8	91.4	75.7	76.3	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES UPPER GAGE -MILLIONTHS	49107	-142.2	-131.0	-131.6	-126.9	-122.8	-164.6	-154.6	-132.8	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES MID GAGE -MILLIONTHS	49108	-21.5	-25.0	-25.0	-26.1	-24.4	-32.5	-28.5	-28.5	0.0	0.0	0.0	0.0
RAIL STRAIN AT MAIN ARRAY -BETWEEN TIES LOWER GAGE -MILLIONTHS	49109	127.8	132.9	147.7	131.2	124.3	144.3	125.5	139.7	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES UPPER GAGE -MILLIONTHS	49118	-208.2	-180.7	-159.2	-205.2	-214.4	-192.9	-238.9	-196.0	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES MID GAGE -MILLIONTHS	49119	-33.7	-40.7	-53.5	-37.8	-29.1	-38.4	-38.9	-37.2	0.0	0.0	0.0	0.0
RAIL STRAIN AT 100 FT EAST-BETWEEN TIES LOWER GAGE -MILLIONTHS	49120	142.0	134.5	128.2	118.9	145.1	143.3	142.6	131.4	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT UPPER GAGE -MILLIONTHS	49110	-137.0	-149.8	-132.0	-148.7	-117.0	-163.6	-130.4	-147.6	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT MID GAGE -MILLIONTHS	49111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -NO.RAIL SEAT LOWER GAGE -MILLIONTHS	49112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH UPPER GAGE -MILLIONTHS	49113	167.5	155.3	170.9	154.2	144.2	155.3	158.7	152.0	0.0	0.0	0.0	0.0
TIE STRAIN AT MAIN ARRAY -MID LENGTH LOWER GAGE -MILLIONTHS	49114	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT UPPER GAGE -MILLIONTHS	49121	-78.6	-94.5	-72.4	-80.3	-77.5	-91.1	-85.4	-79.2	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT MID GAGE -MILLIONTHS	49122	56.5	38.2	56.0	41.4	45.2	34.0	50.3	35.1	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-NO.RAIL SEAT LOWER GAGE -MILLIONTHS	49123	58.3	53.1	33.4	27.7	38.1	45.6	49.0	43.8	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH UPPER GAGE -MILLIONTHS	49124	129.1	120.8	104.4	93.4	118.1	112.6	107.1	98.9	0.0	0.0	0.0	0.0
TIE STRAIN AT 100 FT EAST-MID LENGTH LOWER GAGE -MILLIONTHS	49125	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -NORTH END OF INST TIE -INCHES	49201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEFLECTION AT MAIN ARRAY -RAIL MIDSPAN BETWEEN TIES-INCHES	49202	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF INST TIE -PSI	49205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF INST TIE	49206	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF INST TIE	49207	22.4	24.4	23.5	25.9	23.0	26.8	22.6	27.3	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NO.RAIL SEAT OF LOAD TIE	49208	5.2	7.0	5.2	6.8	5.1	6.8	6.1	7.6	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID LENGTH OF LOAD TIE	49209	11.5	16.1	11.7	16.9	12.4	16.8	14.5	16.8	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SO.RAIL SEAT OF LOAD TIE	49210	22.7	28.7	22.7	28.7	25.2	29.3	21.0	29.3	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -NORTH RAIL BETWEEN TIES -PSI	49211	2.9	4.0	3.6	3.8	2.9	4.8	3.8	4.8	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -MID CRIB BETWEEN TIES -PSI	49212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INTERFACE STRESS MAIN ARRAY -SOUTH RAIL BETWEEN TIES -PSI	49213	9.3	10.1	9.4	10.5	9.3	11.8	8.6	11.6	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -NORTH SEAT LOAD CELL TIE -KIPS	49127	10.3	12.3	11.3	14.0	10.1	15.3	10.1	13.3	0.0	0.0	0.0	0.0
RAIL SEAT FORCE MAIN ARRAY -SOUTH SEAT LOAD CELL TIE -KIPS	49128	11.3	13.4	12.1	14.2	10.3	14.6	9.8	12.1	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 1 NORTH END -KIPS	49129	1.9	2.4	2.4	2.5	1.9	2.6	1.9	2.7	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 2 -KIPS	49130	1.4	1.7	1.5	1.6	1.3	2.0	1.3	1.7	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 3 -KIPS	49131	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 4 -KIPS	49132	2.1	2.7	2.3	2.6	2.1	3.0	2.2	2.8	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 5 -KIPS	49133	1.3	1.7	1.6	1.8	1.5	2.1	1.4	1.7	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 6 -KIPS	49134	1.7	2.0	1.9	2.1	1.7	2.2	1.7	2.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 7 -KIPS	49135	2.9	3.4	3.2	3.4	2.8	3.6	2.8	3.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 8 -KIPS	49136	3.9	4.3	4.1	4.7	3.7	5.2	3.7	4.1	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD - 9 -KIPS	49137	2.0	2.4	2.0	2.7	1.8	2.8	1.8	2.0	0.0	0.0	0.0	0.0
TIE BASE FORCE MAIN ARRAY -BASE PAD -10 SOUTH END -KIPS	49138	2.0	2.2	2.0	2.3	2.0	2.6	2.8	2.0	0.0	0.0	0.0	0.0
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 1 -KIPS		33.00	33.00	33.24	33.24	32.35	32.35	33.27	33.27				
TRAIN DATA -WHEEL LOAD FOR TRAIN NUMBER 2 -KIPS		32.97	32.97	32.66	32.66	32.97	32.97	32.66	32.66				

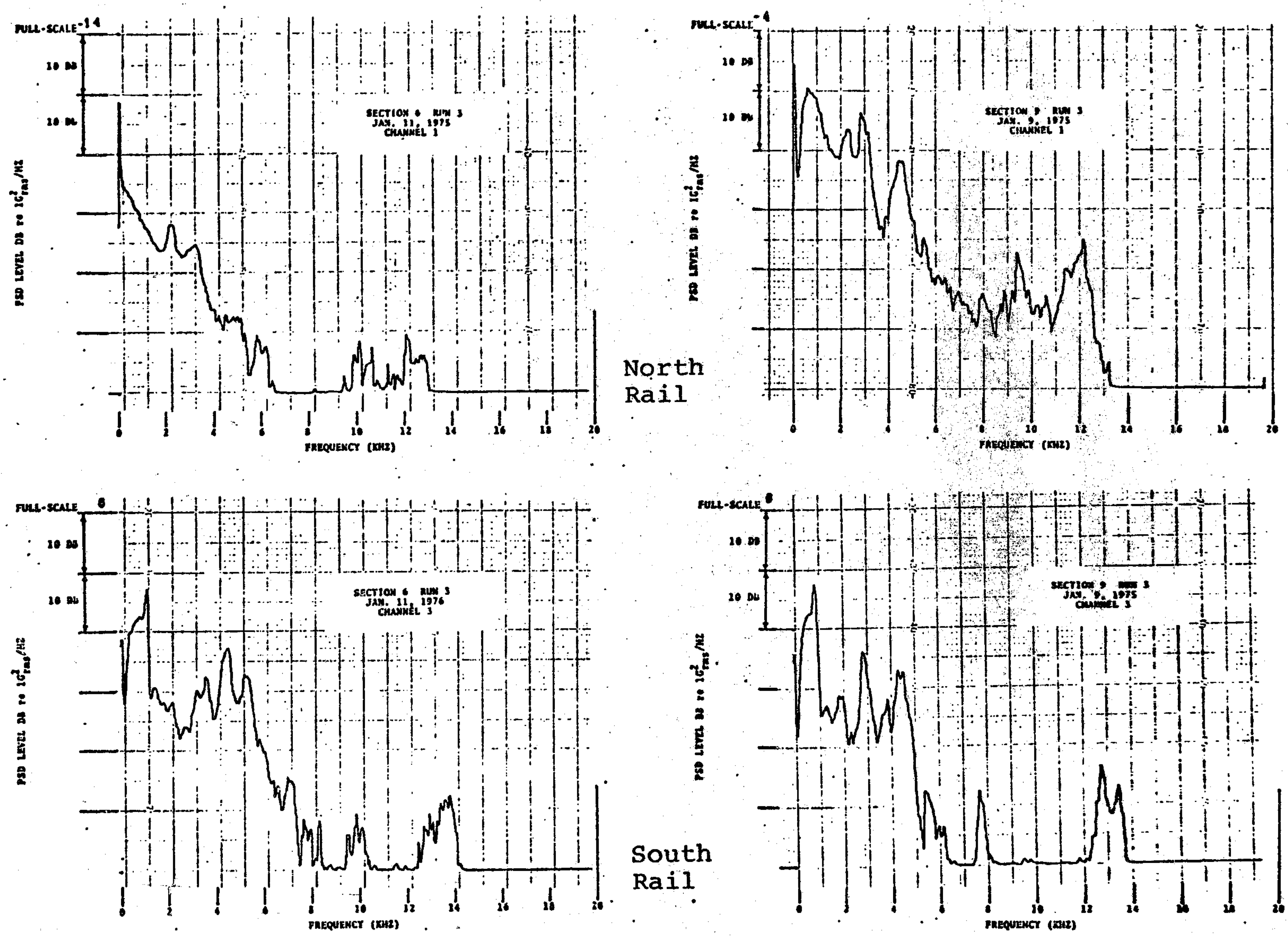


FIGURE C1 - RAIL VERTICAL ACCELERATION FOR TEST 3 ON WOOD TIE TRACK SECTIONS

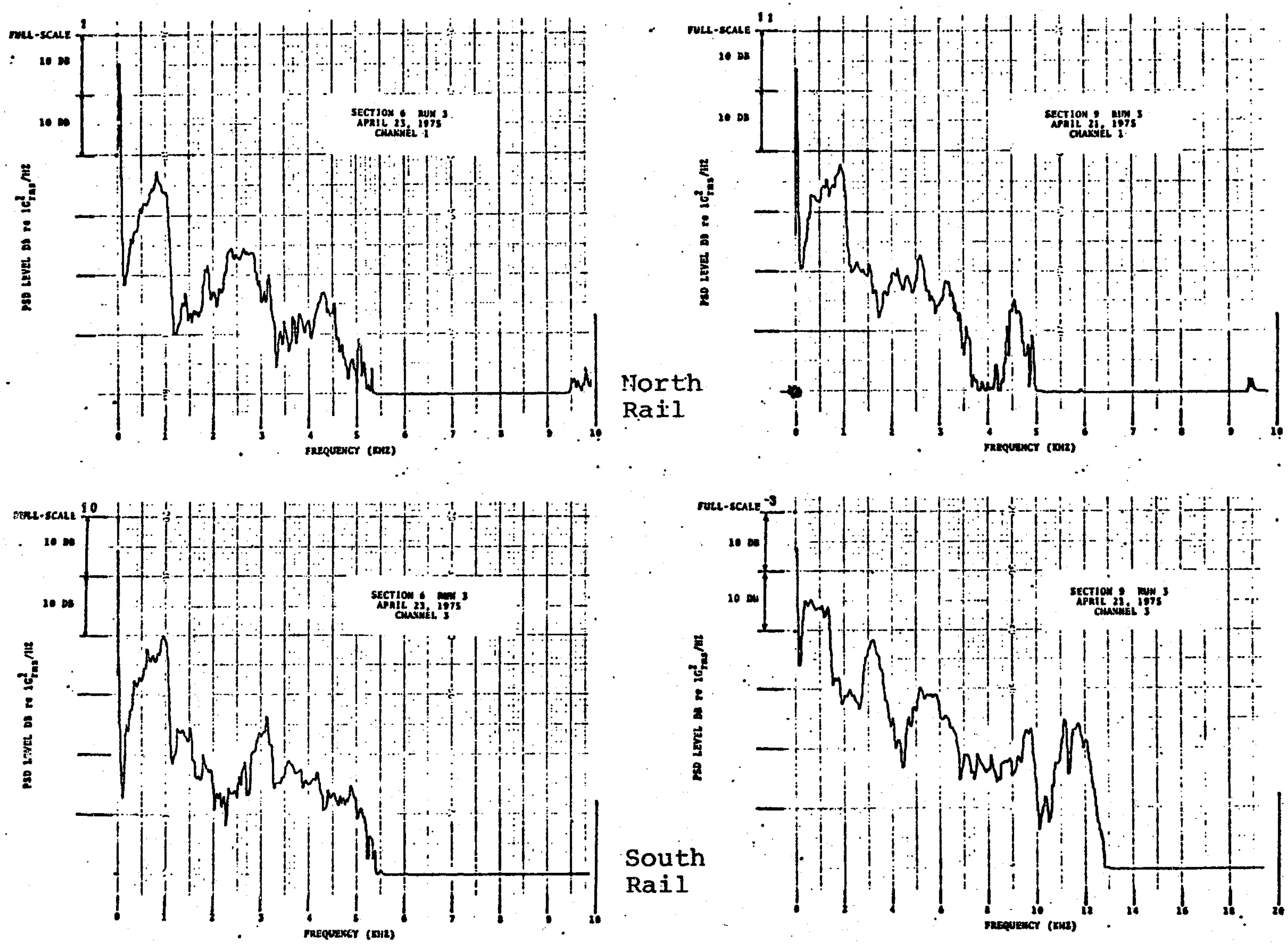


FIGURE C2 - RAIL VERTICAL ACCELERATION FOR TEST 4 ON WOOD TIE TRACK SECTIONS

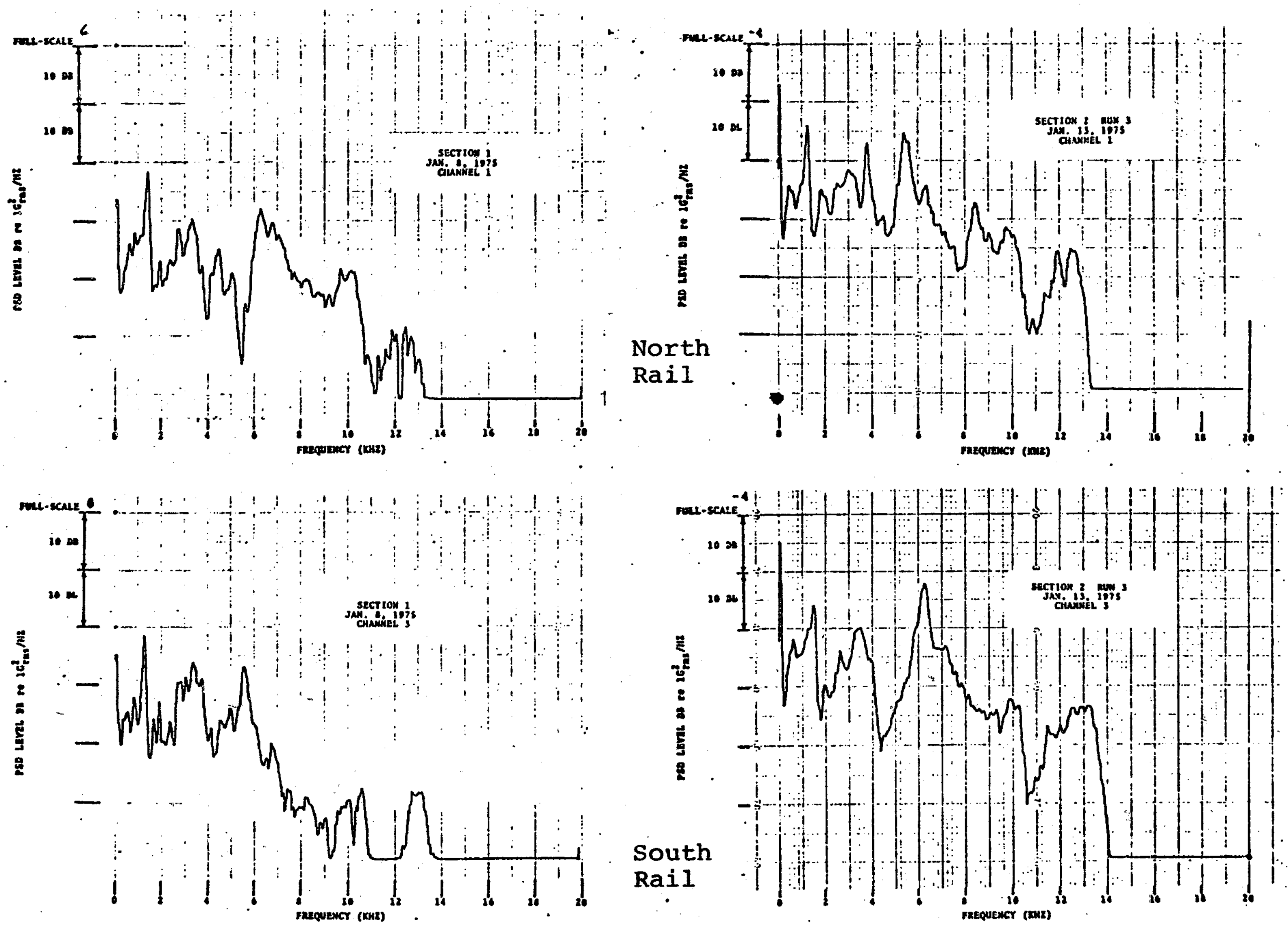


FIGURE C3 - RAIL VERTICAL ACCELERATION FOR TEST 3 ON CONCRETE TIE TRACK SECTIONS 1 and 2

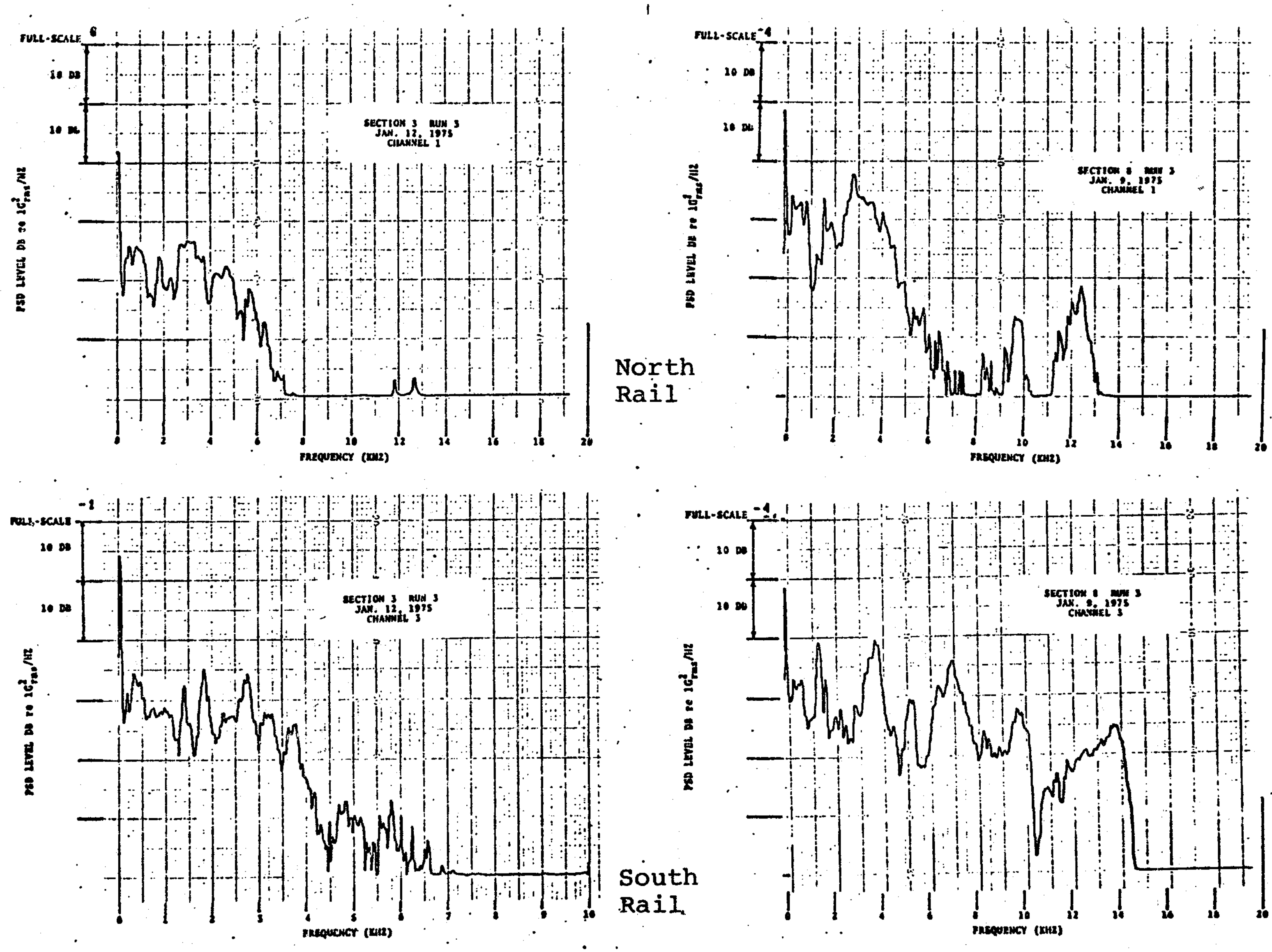


FIGURE C4 - RAIL VERTICAL ACCELERATION FOR TEST 3 ON CONCRETE TIE TRACK SECTIONS 3 and 8

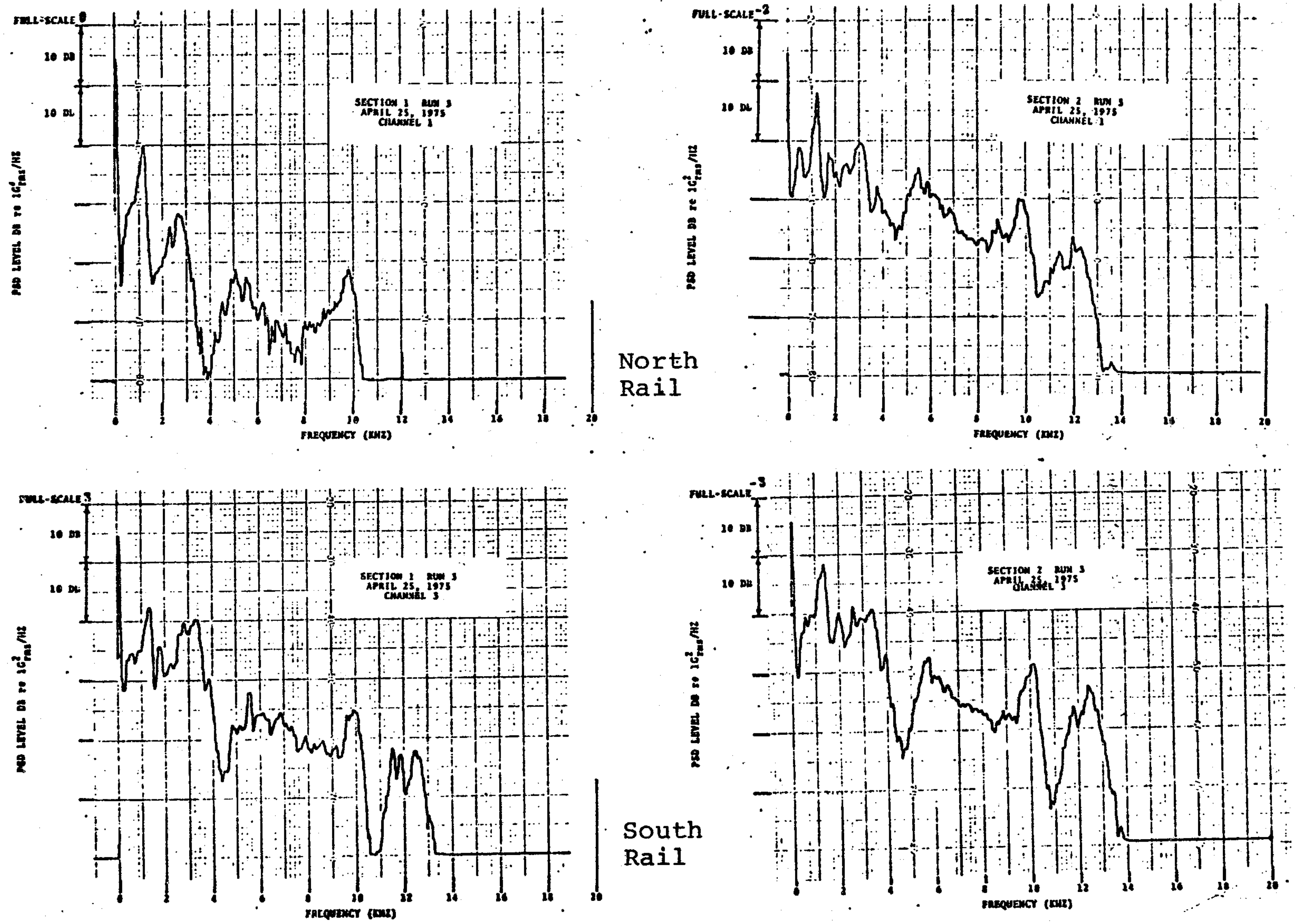


FIGURE C5 - RAIL VERTICAL ACCELERATION FOR TEST 4 ON CONCRETE TIE TRACK SECTIONS 1 and 2

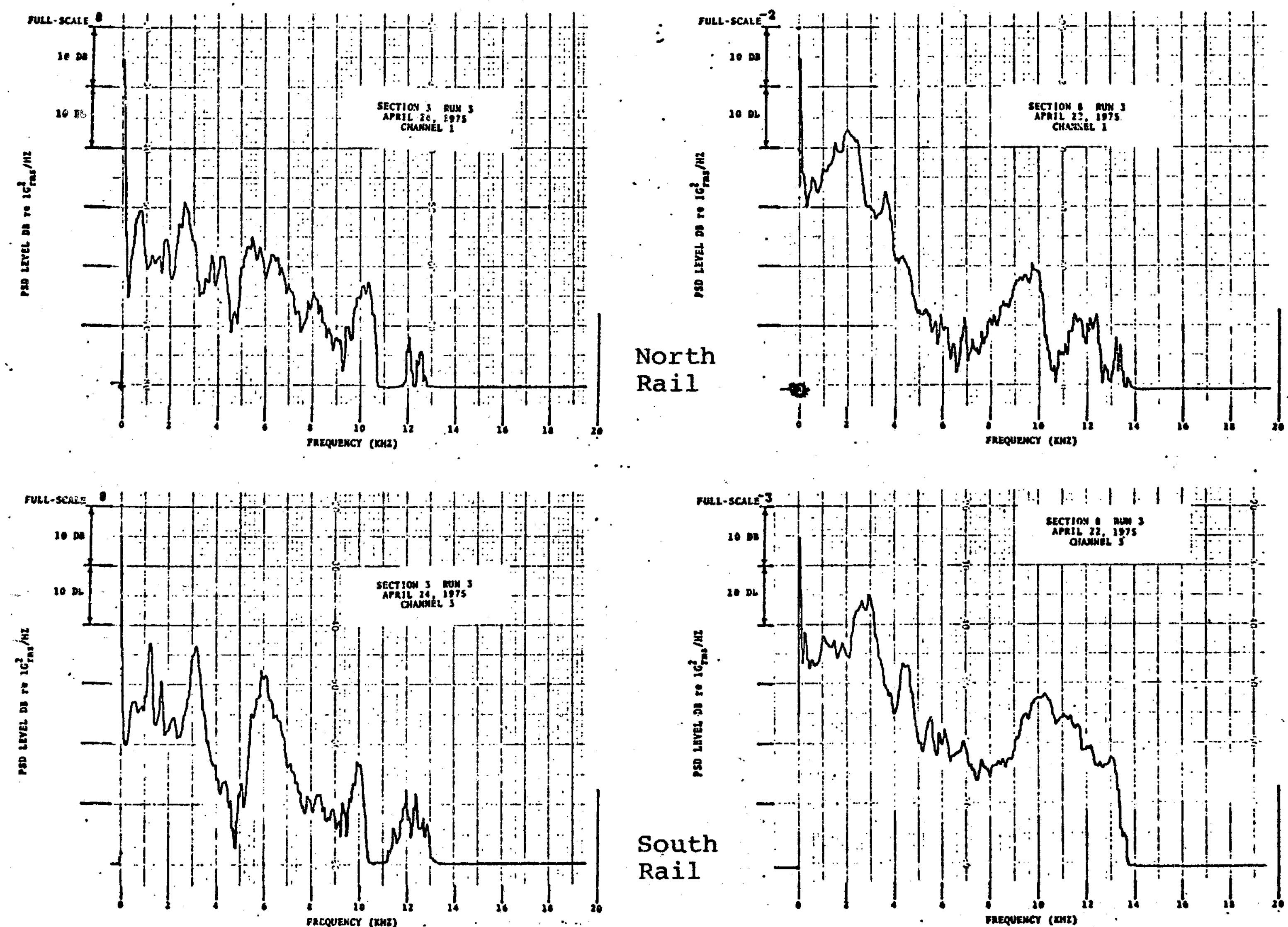


FIGURE C6 - RAIL VERTICAL ACCELERATION FOR TEST 4 ON CONCRETE TIE TRACK SECTIONS 3 and 8

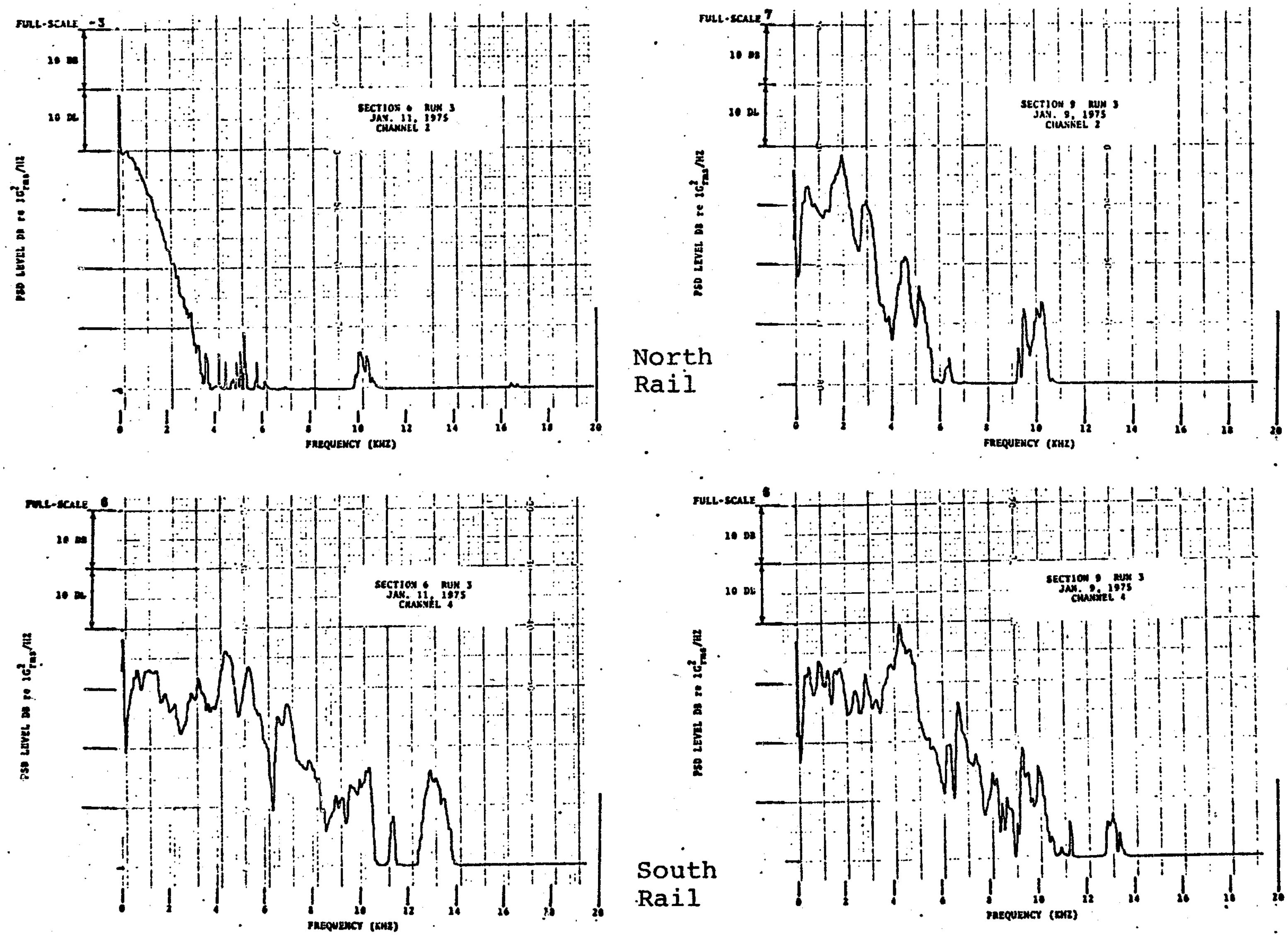


FIGURE C7 - RAIL HORIZONTAL ACCELERATION FOR TEST 3 ON WOOD TIE TRACK SECTIONS

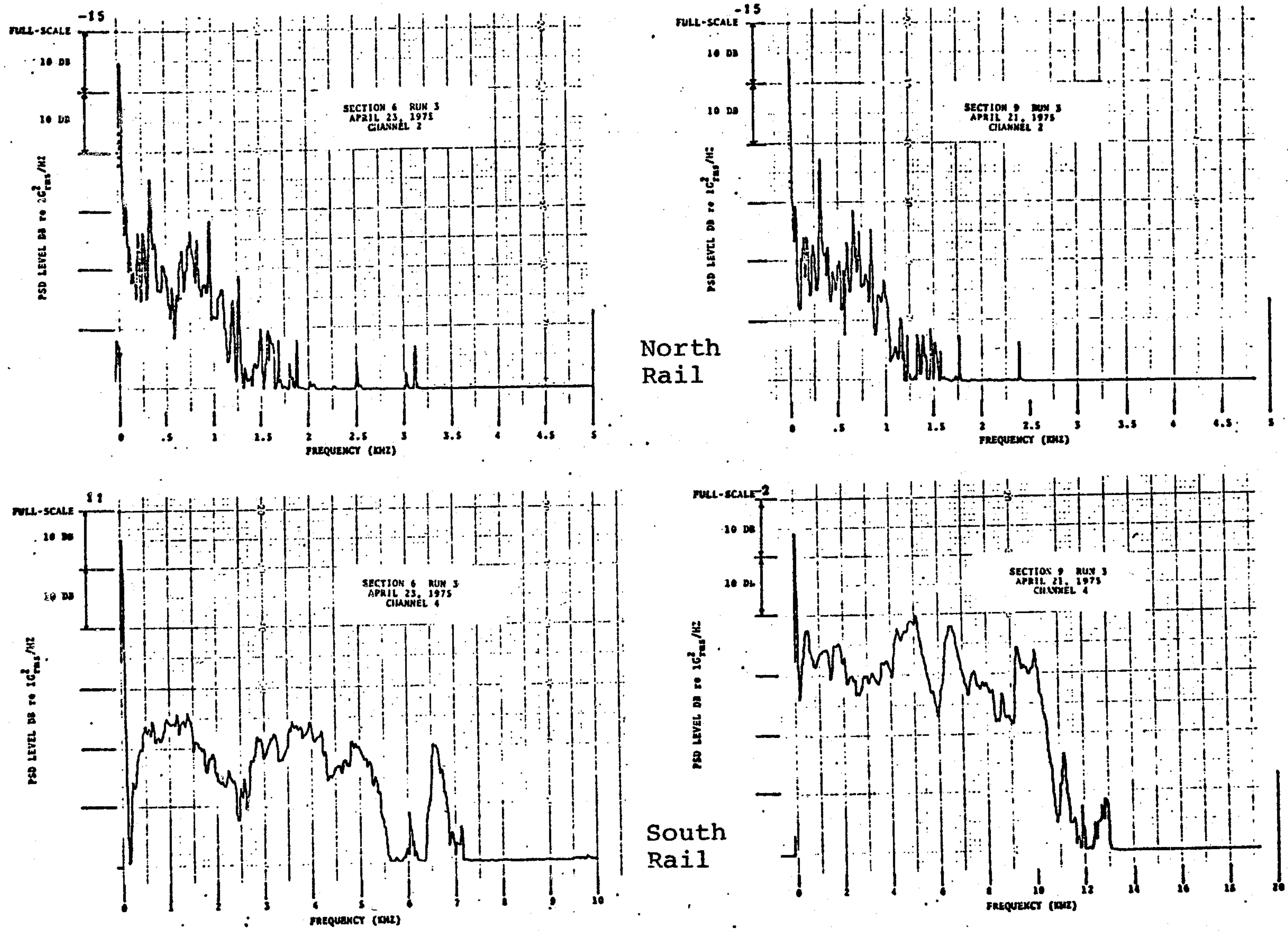


FIGURE C8 - RAIL HORIZONTAL ACCELERATION FOR TEST 4 ON WOOD TIE TRACK SECTIONS

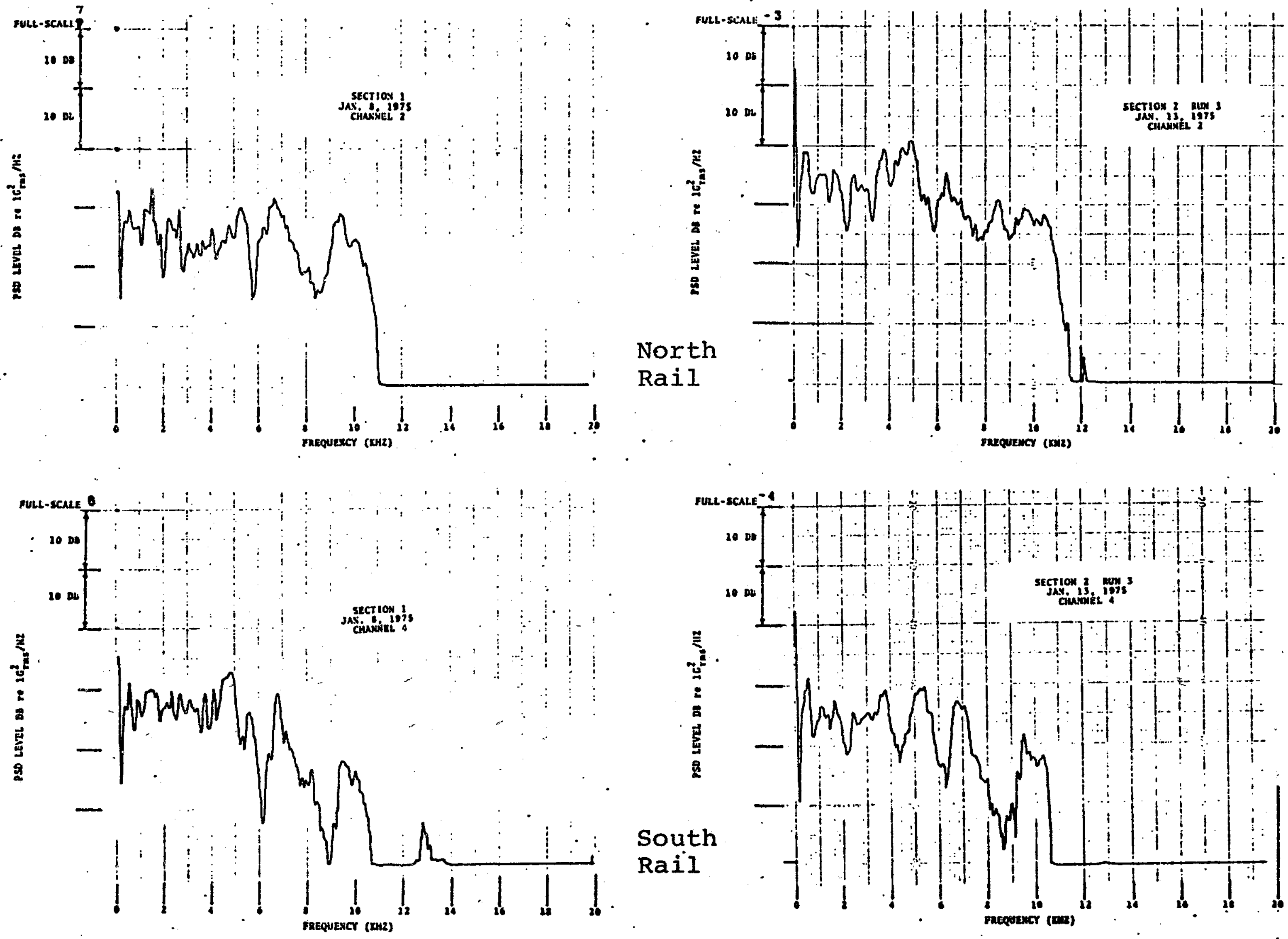


FIGURE C9 - RAIL HORIZONTAL ACCELERATION FOR TEST 3 ON CONCRETE TIE TRACK SECTIONS 1 and 2

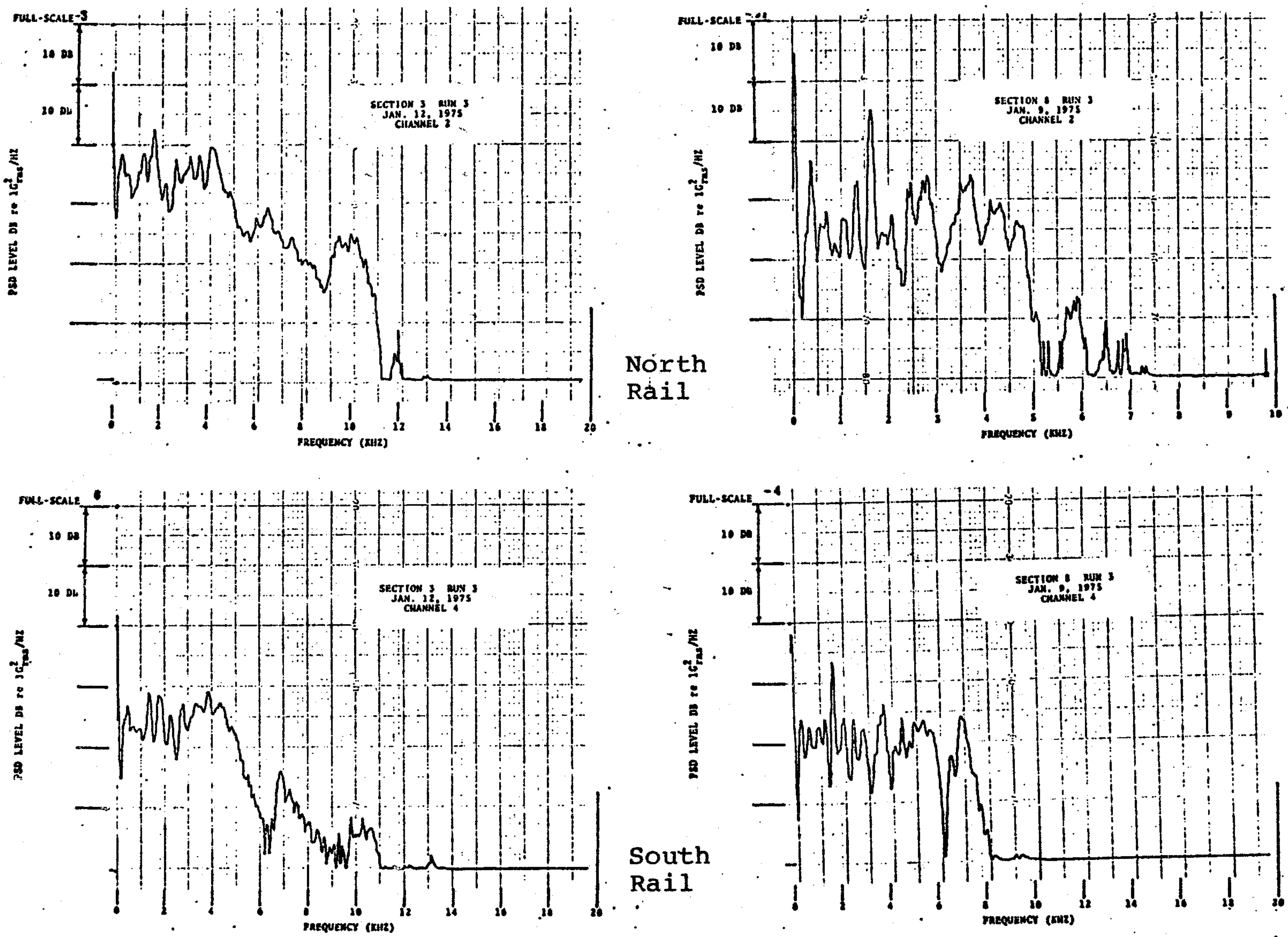


FIGURE C10 - RAIL HORIZONTAL ACCELERATION FOR TEST 3 ON CONCRETE TIE TRACK SECTIONS 3 and 8

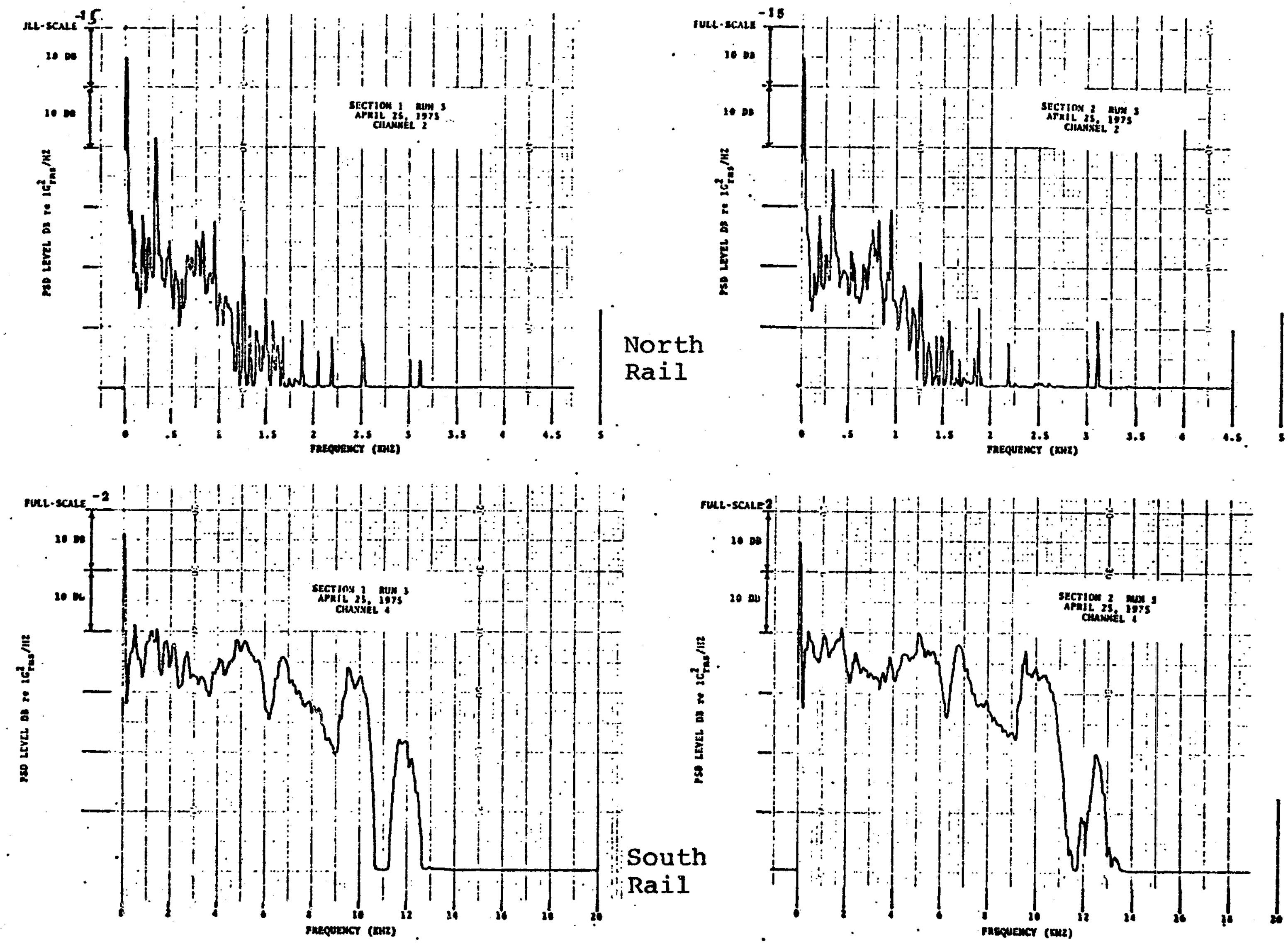


FIGURE C11 - RAIL HORIZONTAL ACCELERATION FOR TEST 4 ON CONCRETE TIE TRACK SECTIONS 1 and 2

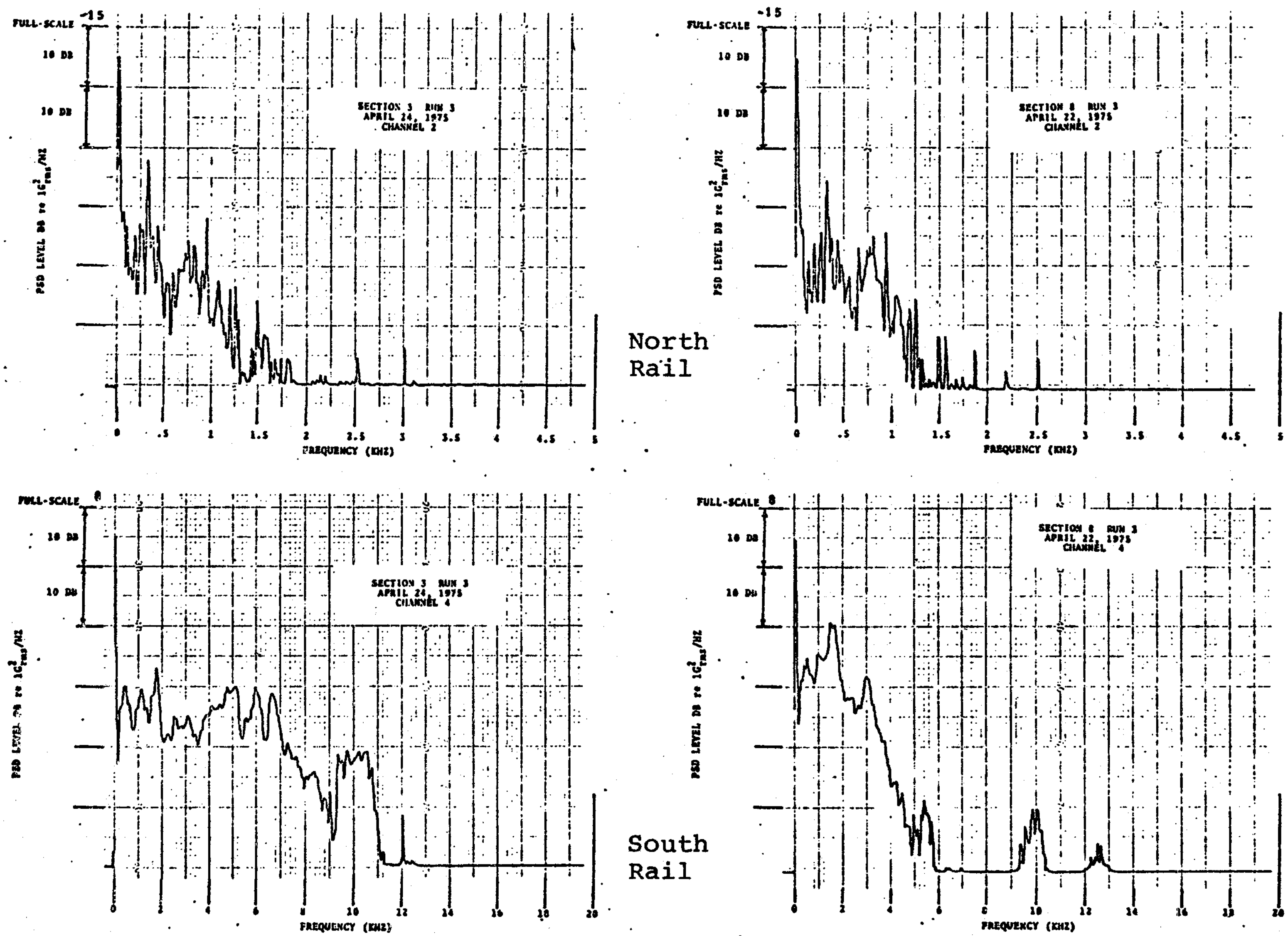


FIGURE C12 - RAIL HORIZONTAL ACCELERATION FOR TEST 4 ON CONCRETE TIE TRACK SECTIONS 3 and 8

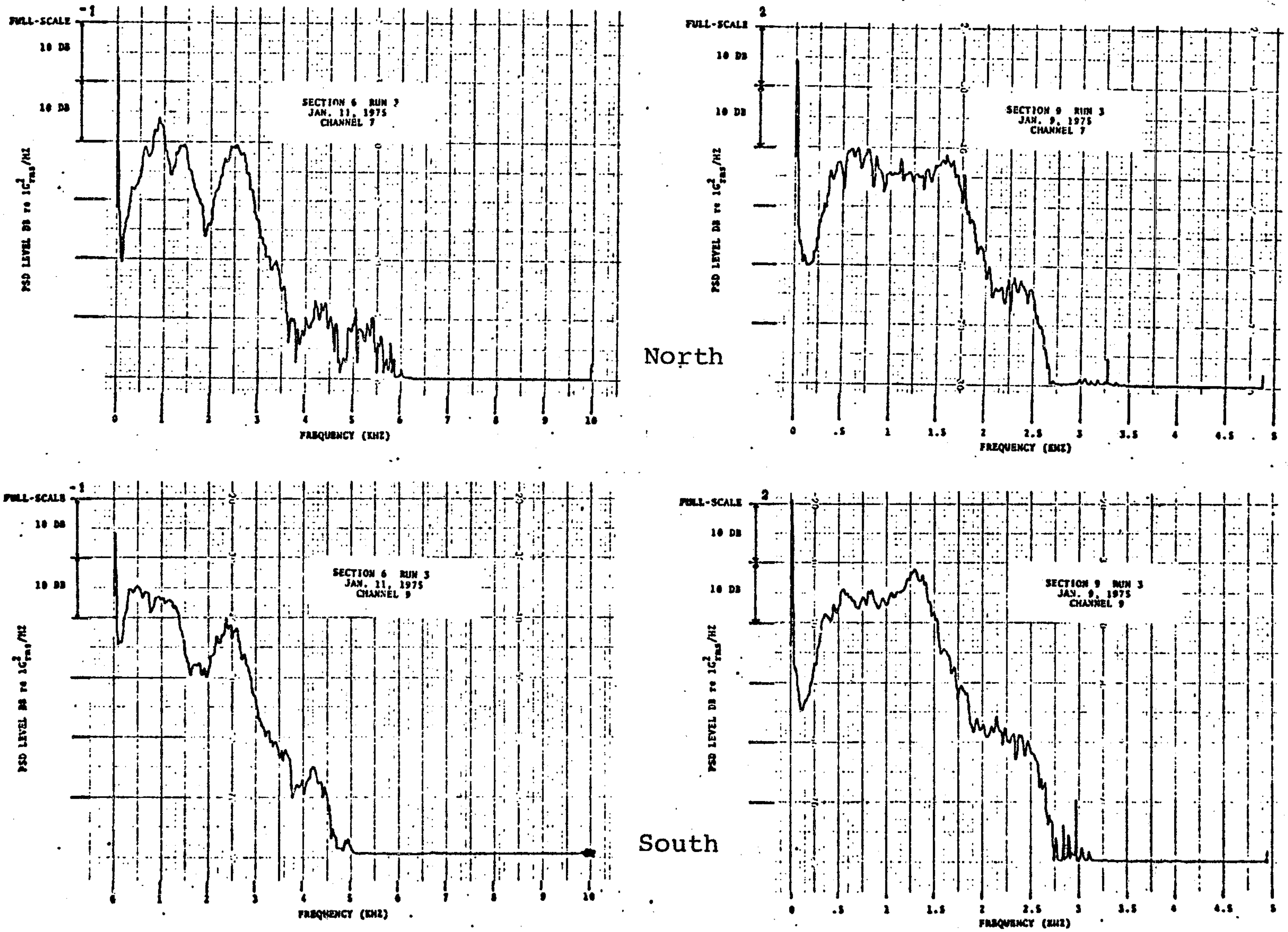


FIGURE C13 - WOOD TIE RAIL SEAT ACCELERATION FOR TEST 3

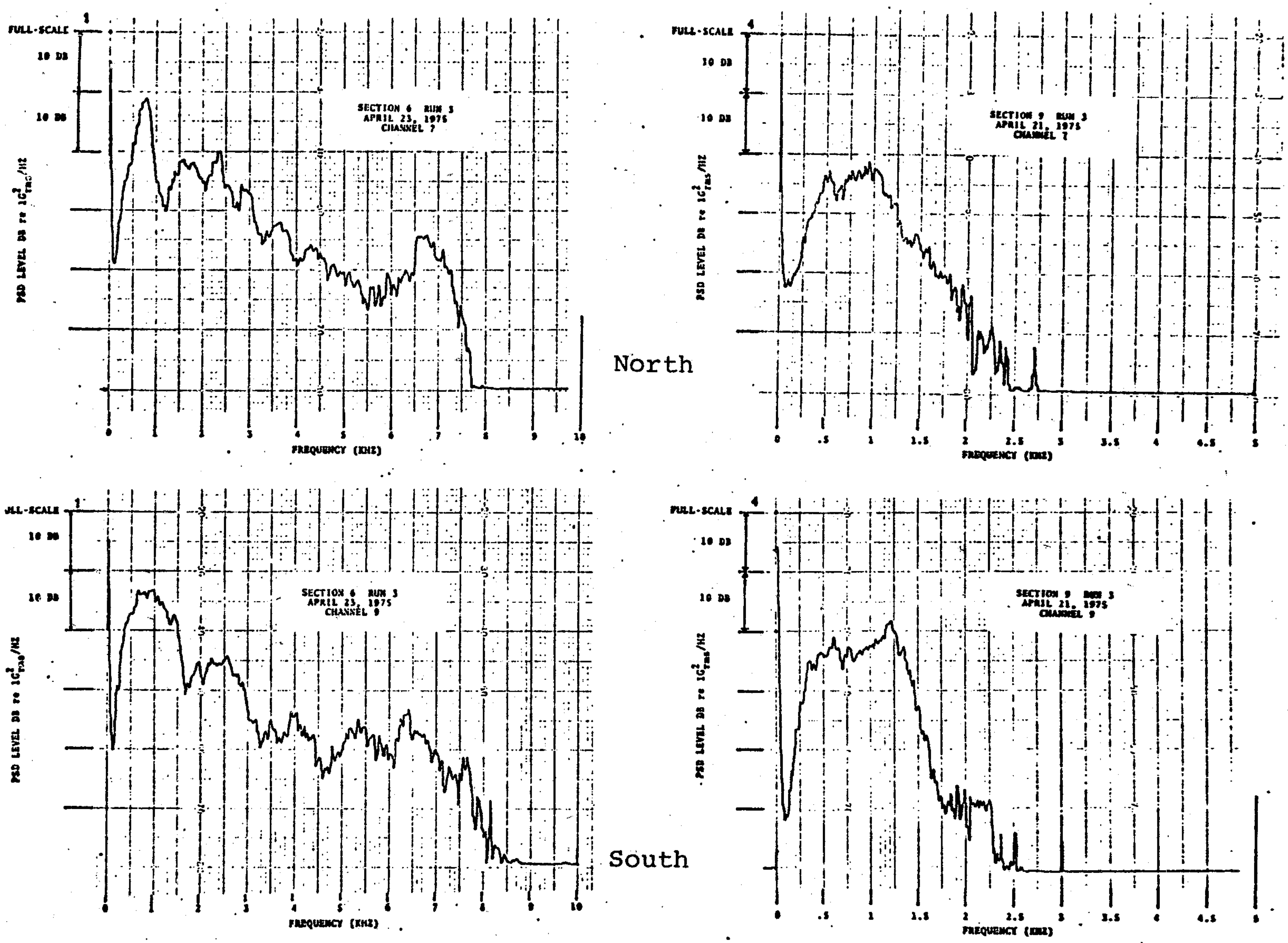


FIGURE C14 - WOOD TIE RAIL SEAT ACCELERATION FOR TEST 4

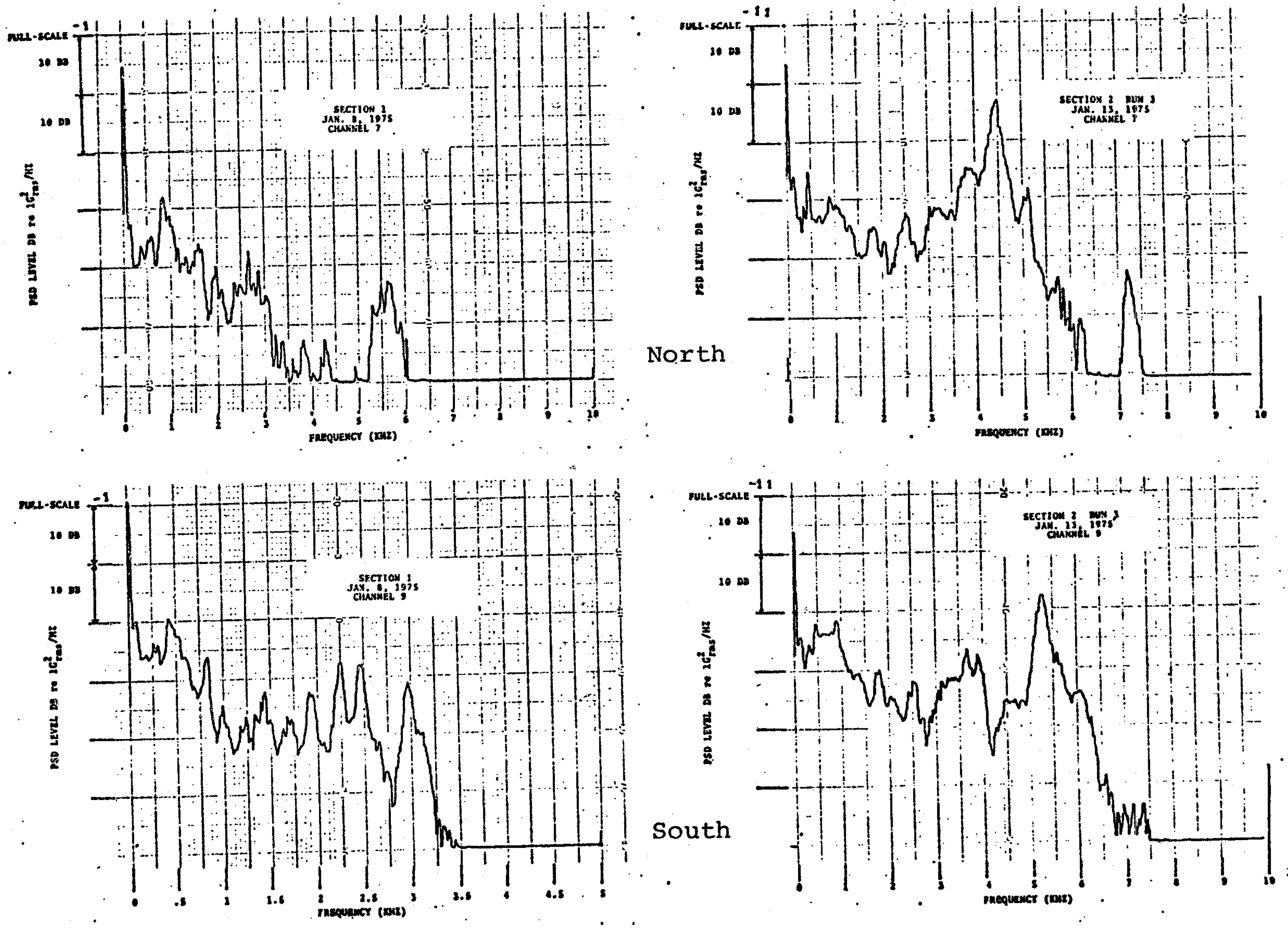


FIGURE C15 - CONCRETE TIE RAIL SEAT ACCELERATION FOR TEST 3 ON SECTIONS 1 and 2

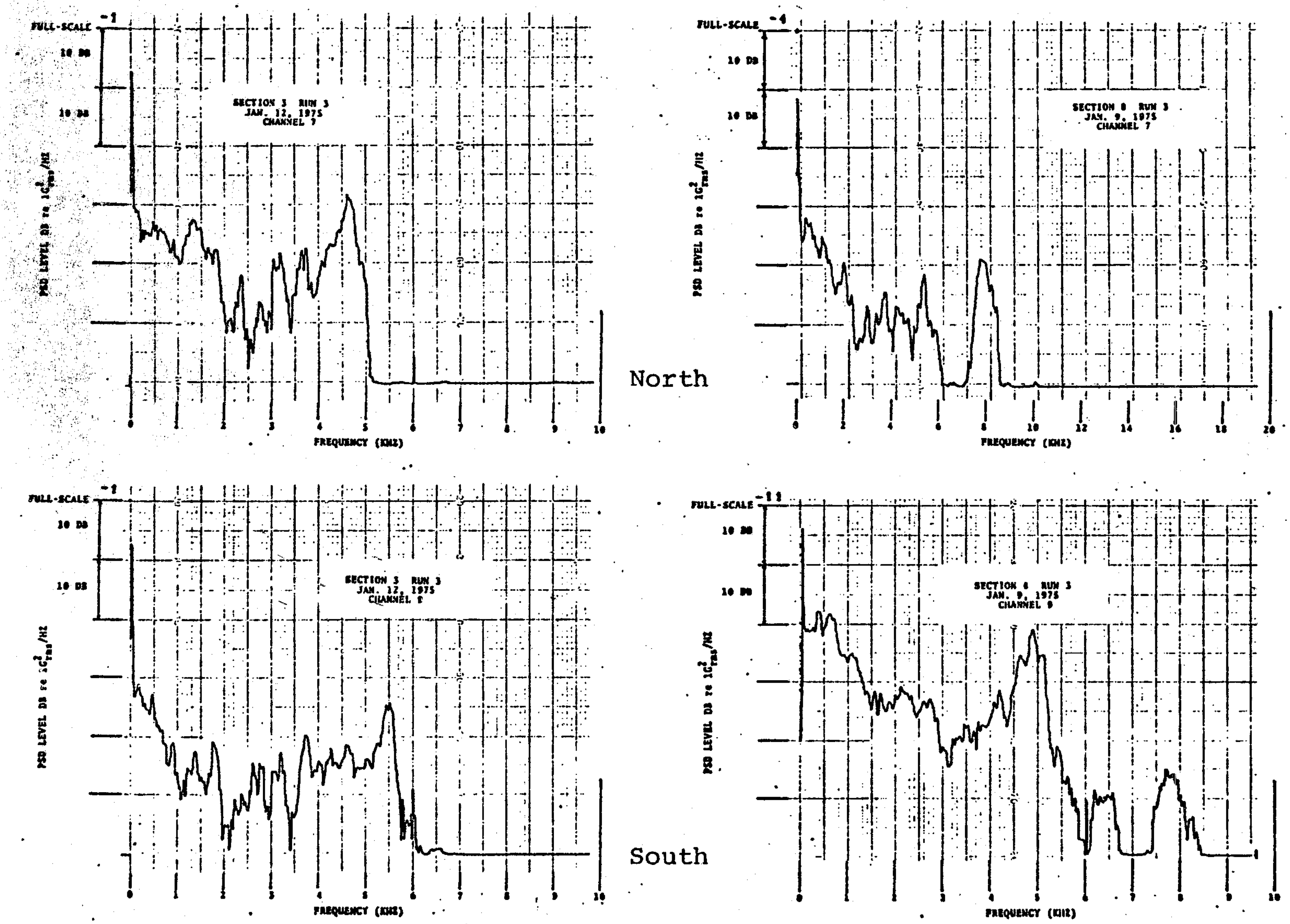


FIGURE C16 - CONCRETE TIE RAIL SEAT ACCELERATION FOR TEST 3 ON SECTIONS 3 and 8

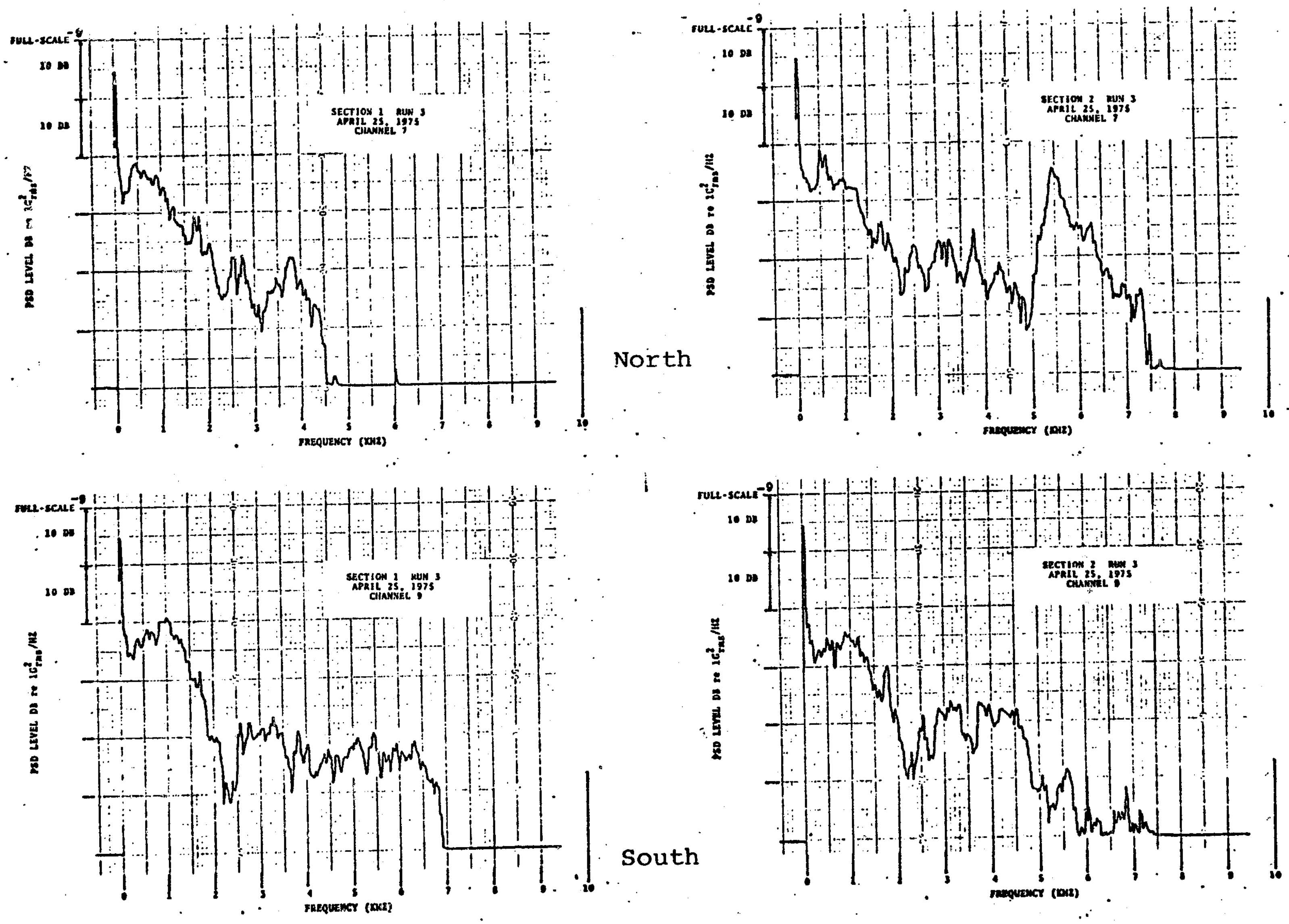


FIGURE C17 - CONCRETE TIE RAIL SEAT ACCELERATION FOR TEST 4 ON SECTIONS 1 and 2

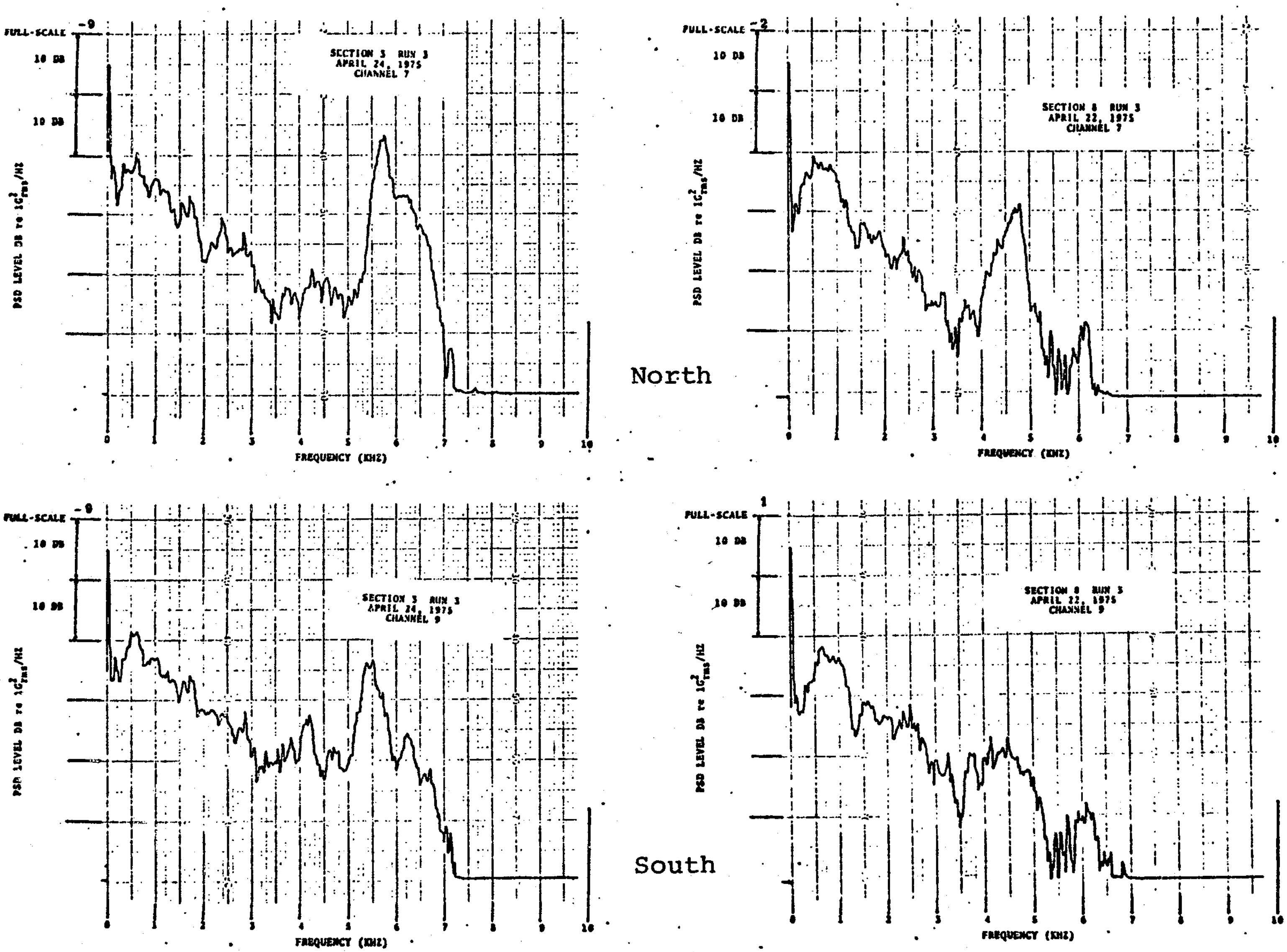


FIGURE C18 - CONCRETE TIE RAIL SEAT ACCELERATION FOR TEST 4 ON SECTIONS 3 and 8

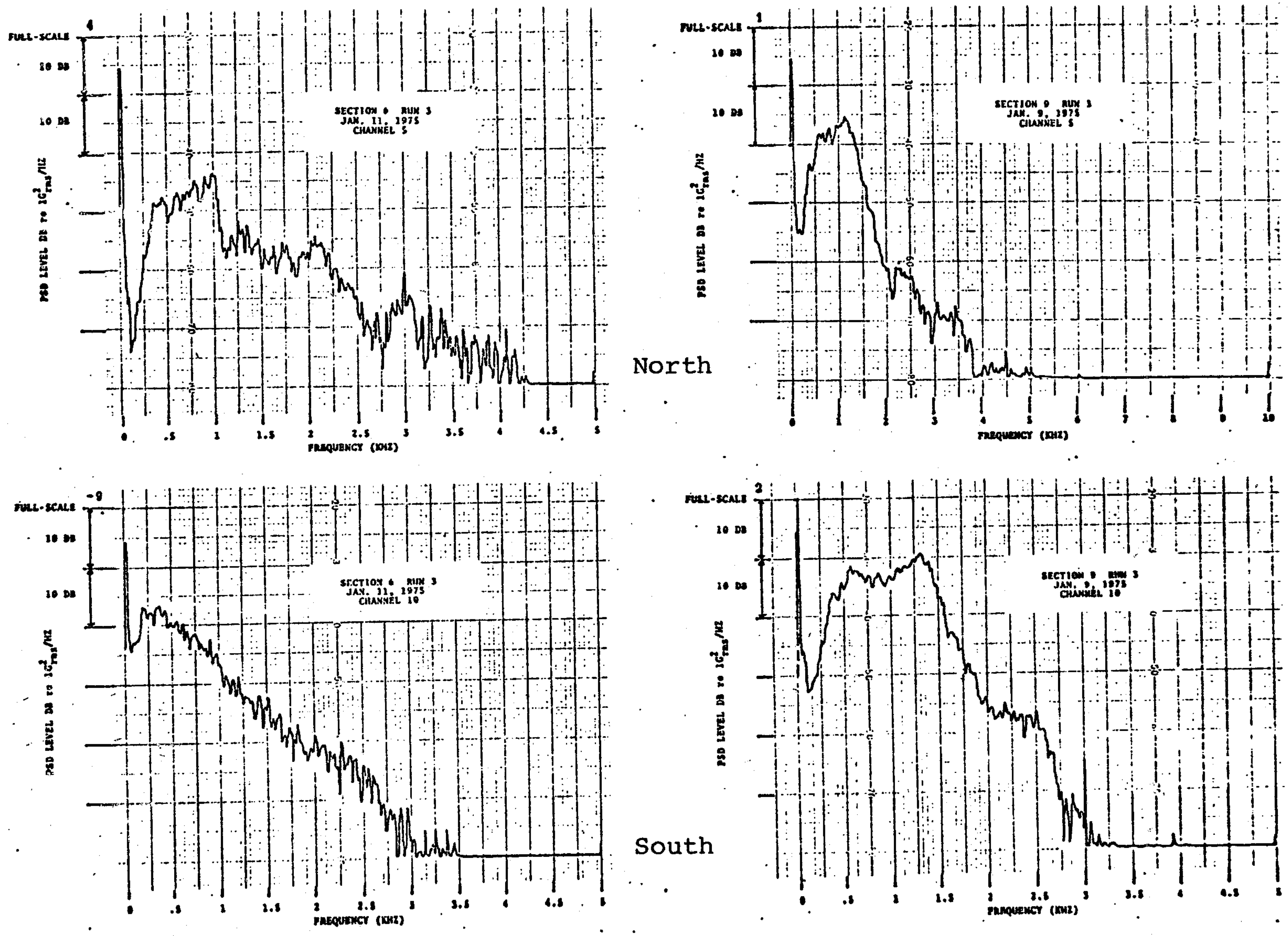


FIGURE C19 - WOOD TIE END ACCELERATION FOR TEST 3

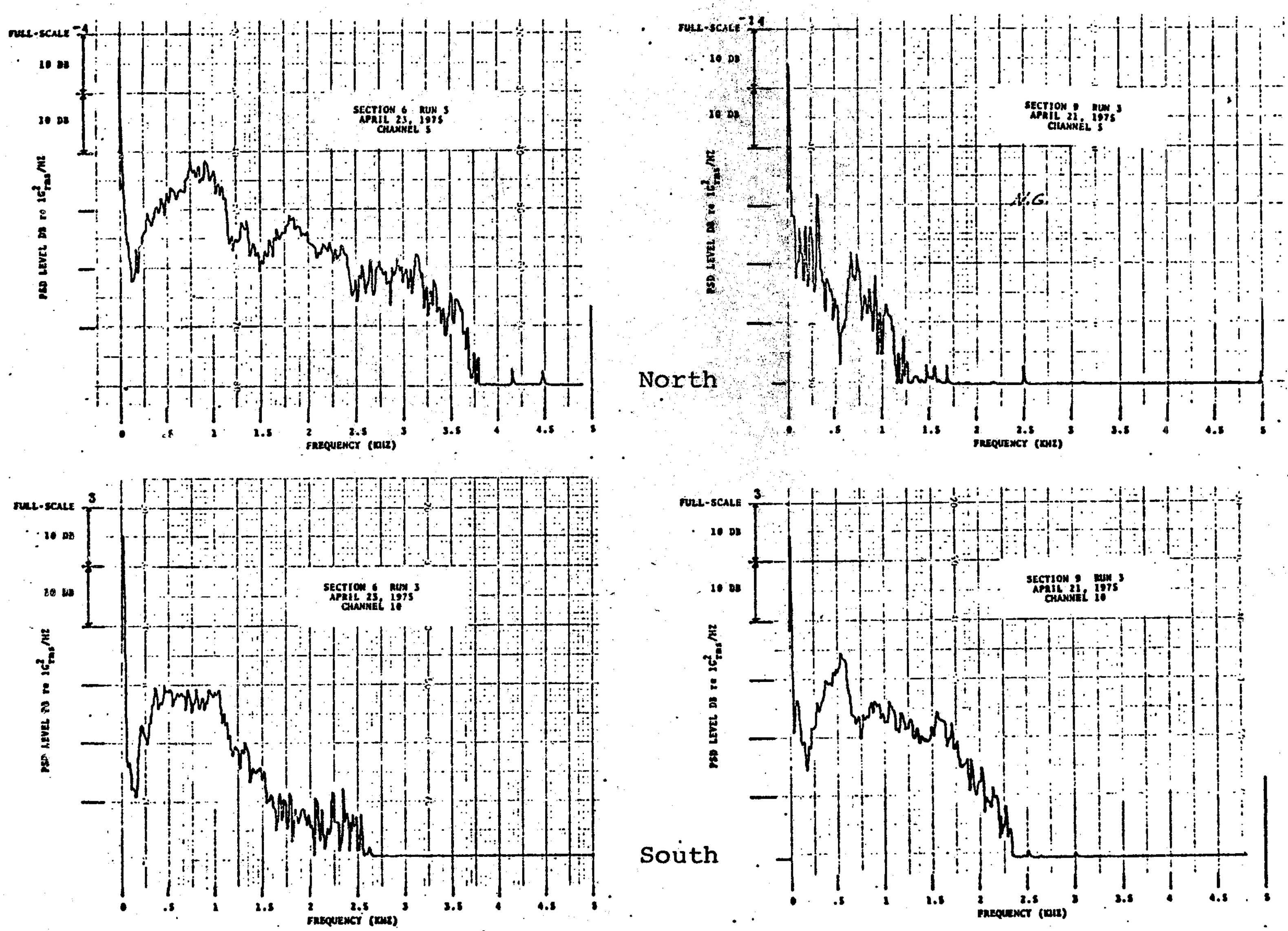


FIGURE C20 - WOOD TIE END ACCELERATION FOR TEST 4

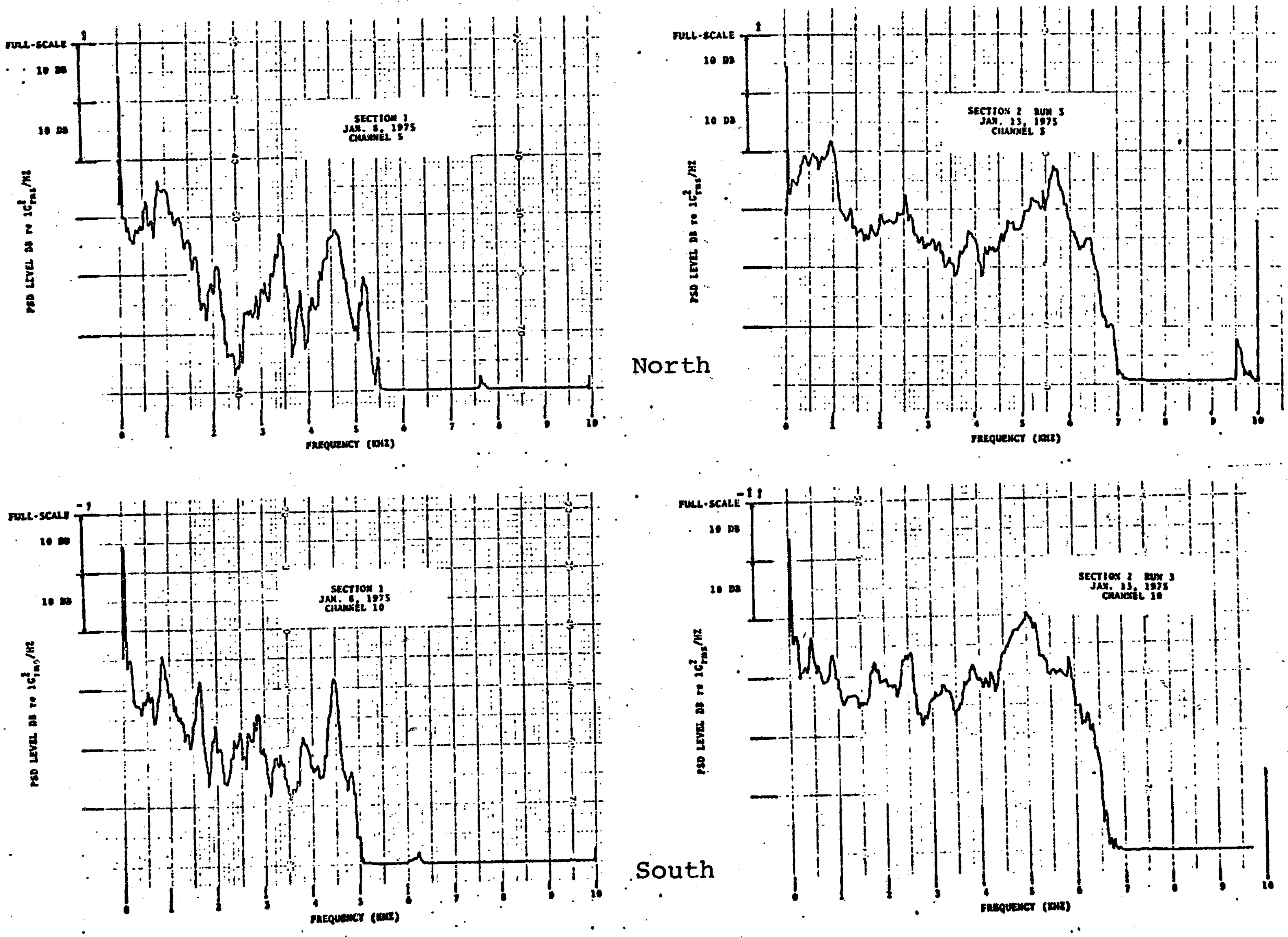
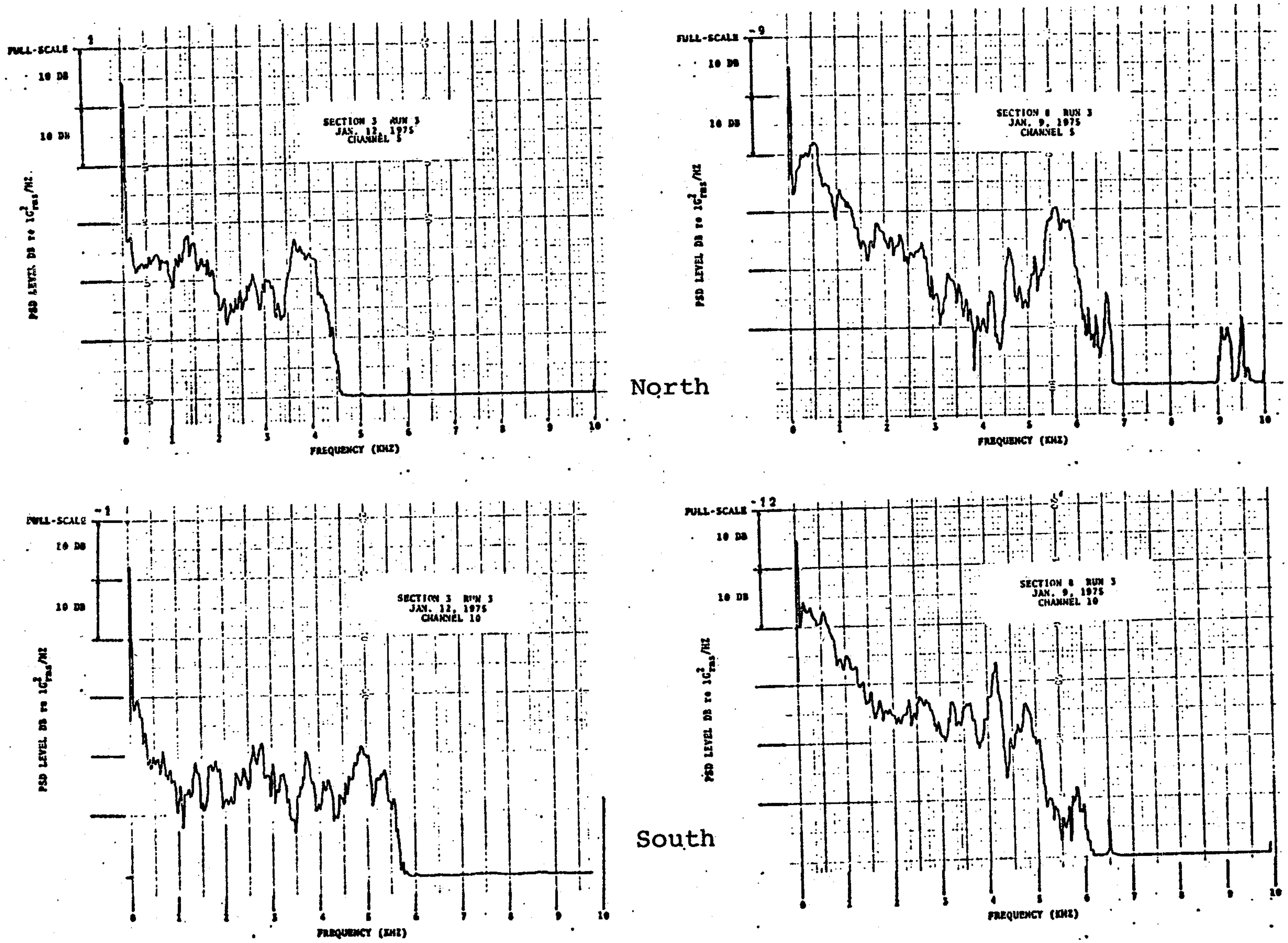


FIGURE C21 - CONCRETE TIE END ACCELERATION FOR TEST 3 ON SECTIONS 1 and 2



North

South

FIGURE C22 - CONCRETE TIE END ACCELERATION FOR TEST 3 ON SECTIONS 3 AND 8

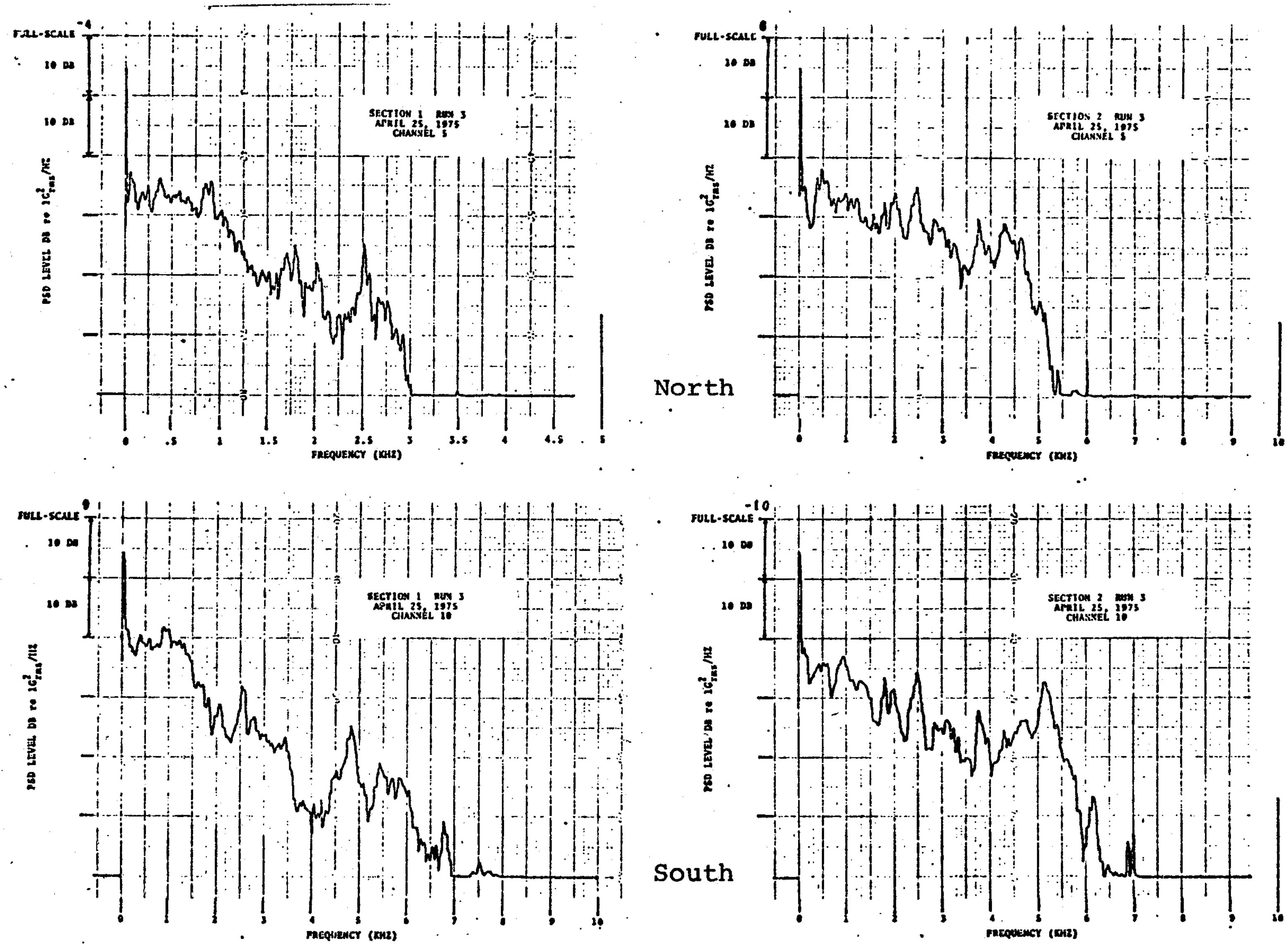


FIGURE C23 - CONCRETE TIE END ACCELERATION FOR TEST 4 ON SECTIONS 1 AND 2

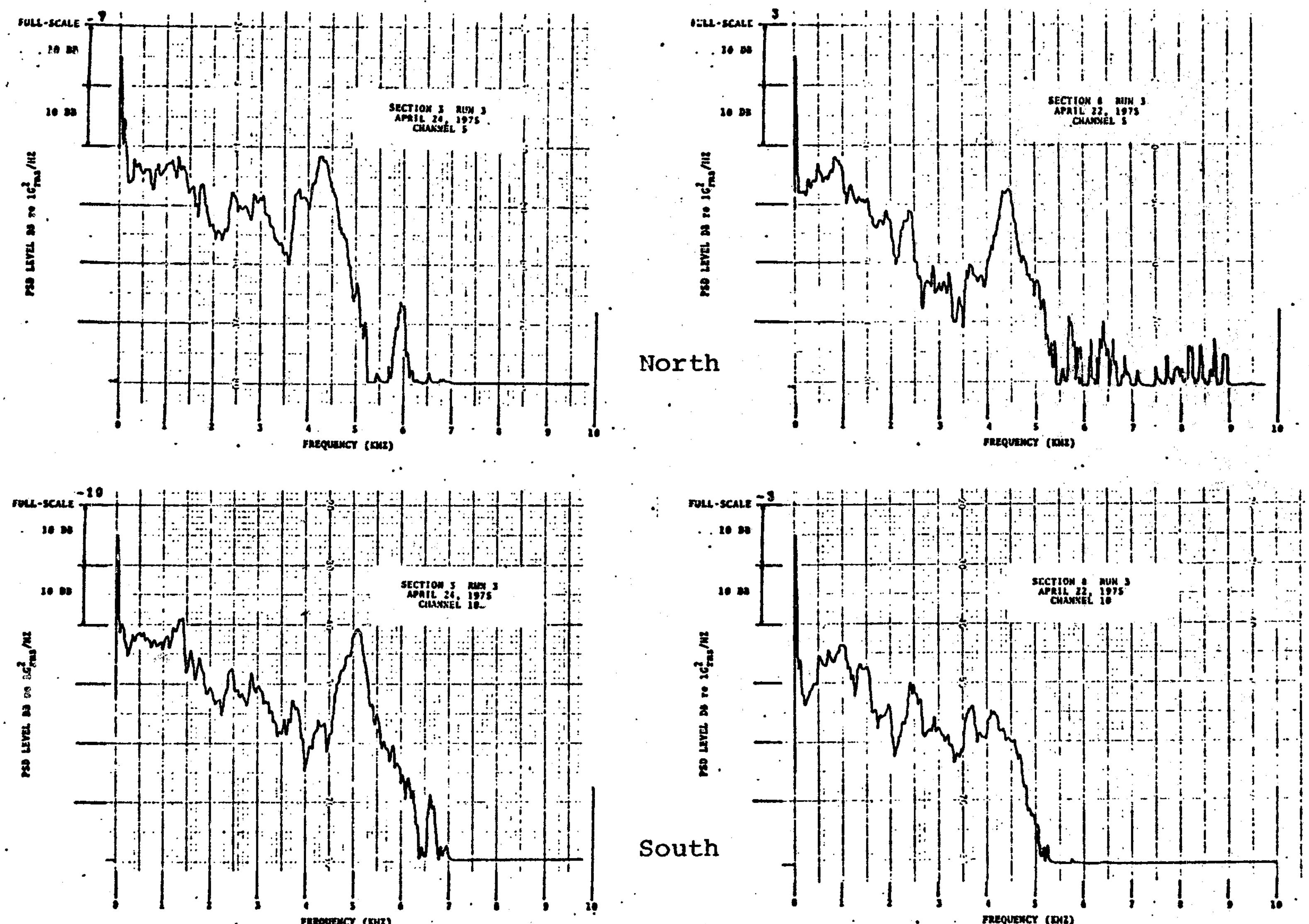


FIGURE C24 - CONCRETE TIE END ACCELERATION FOR TEST 4 ON SECTIONS 3 AND 8

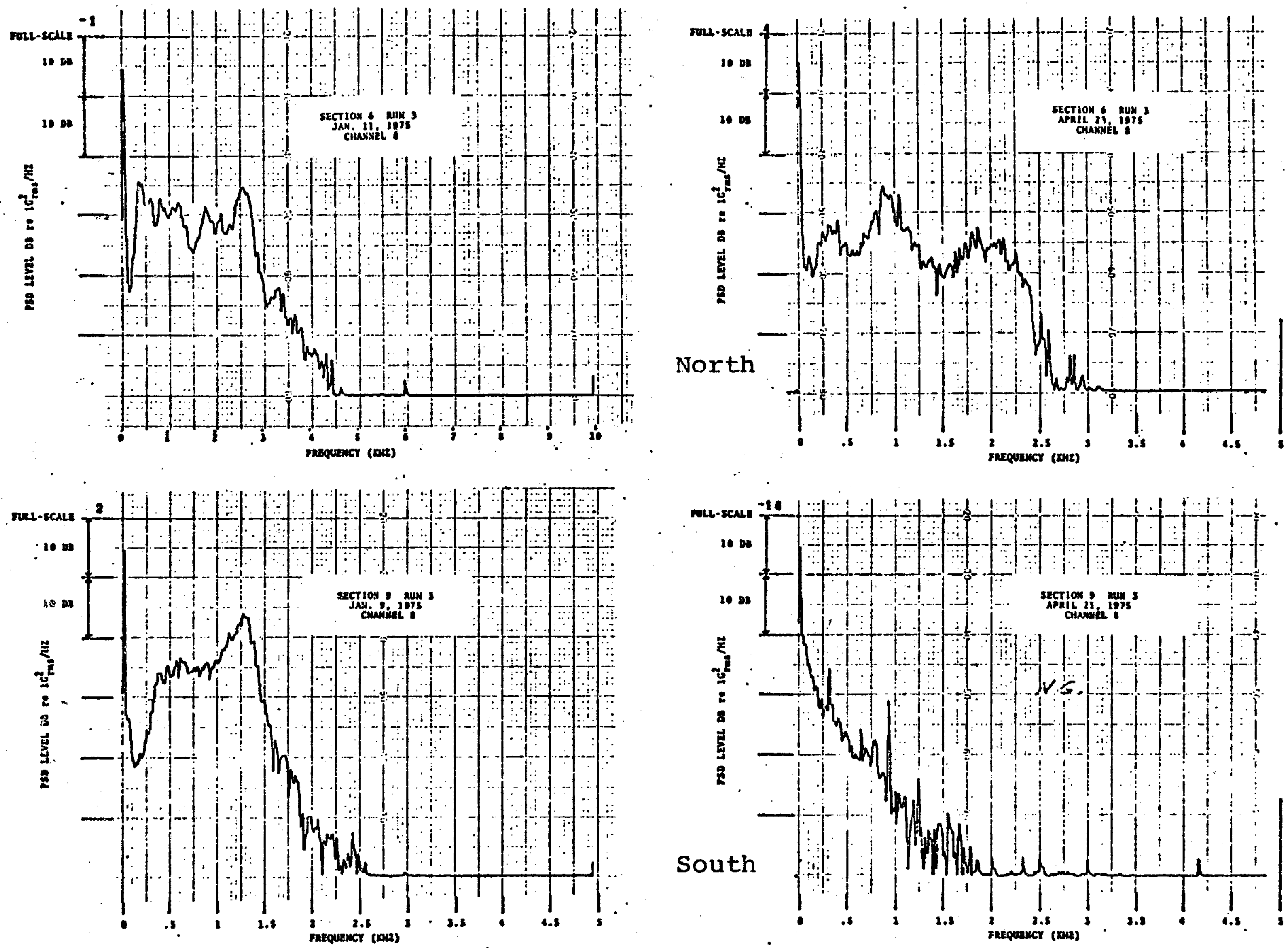


FIGURE C25 - WOOD TIE MIDLENGTH ACCELERATION FOR TESTS 3 AND 4

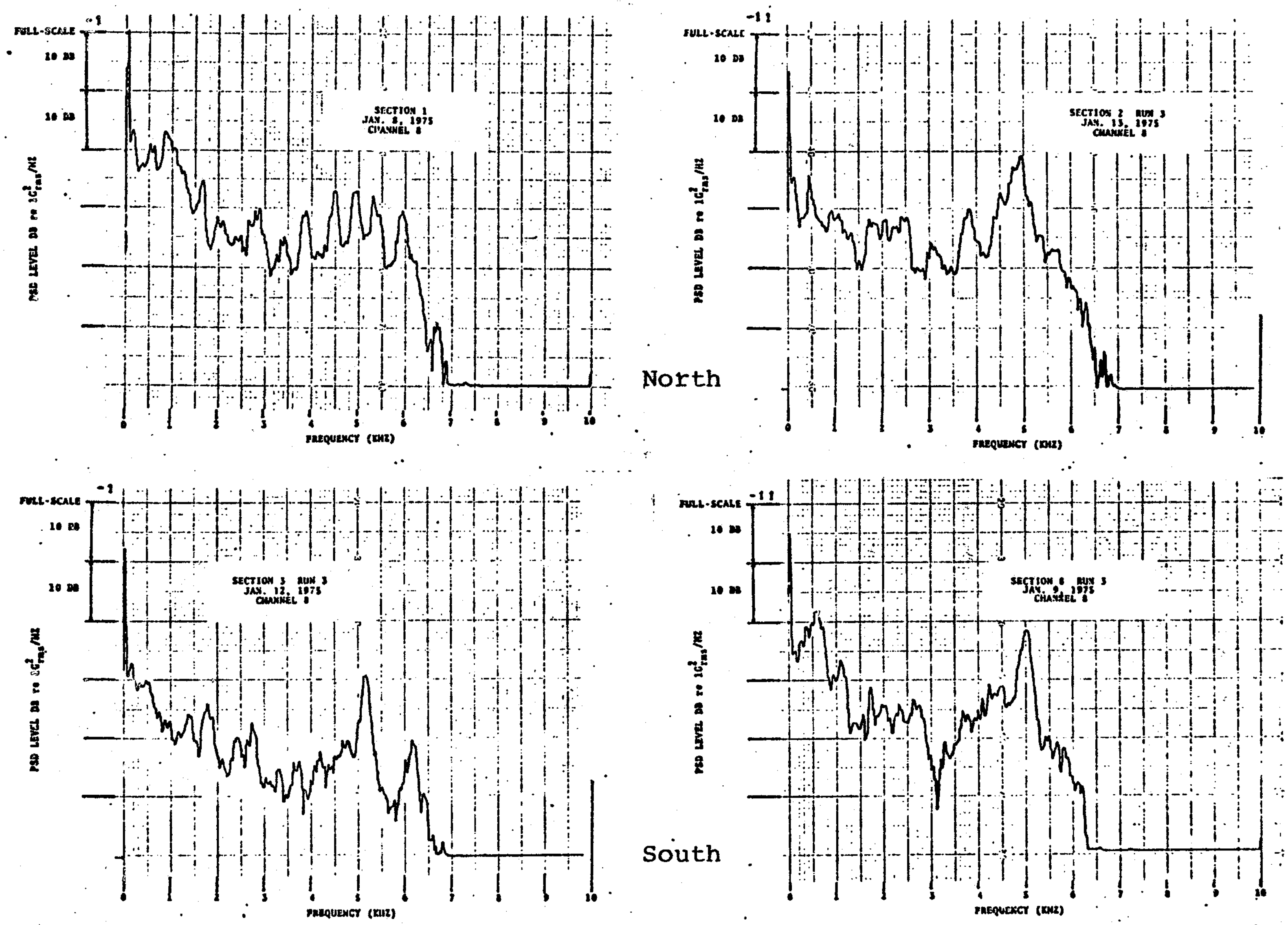


FIGURE C26 - CONCRETE TIE MIDLENGTH ACCELERATION FOR TEST 3

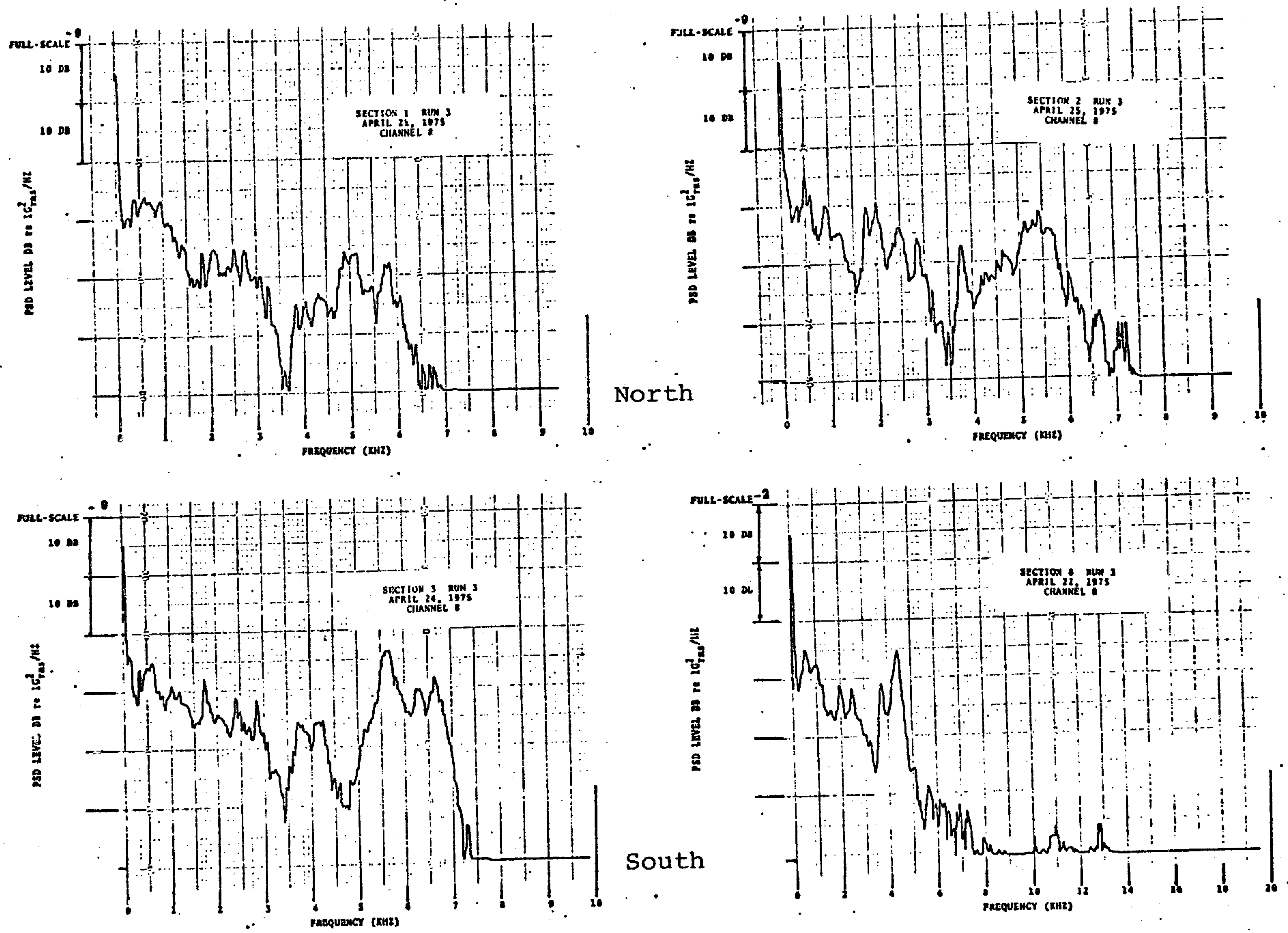


FIGURE C27 - CONCRETE TIE MIDLENGTH ACCELERATION FOR TEST 4

APPENDIX D

BEAM AND SLAB TRACK DATA

Data reduced from oscillisgraph records are shown in Tables D2 to D30 for beam and slab track sections 4, 4-1, 5, 5-1, and 7. In addition, Table D1 lists details of engines monitored during the tests.

Concrete deflection data are listed in Table D2 to D6. Rail deflection data are listed in Tables D7 to D9. Soil pressure data are listed in Tables D10 to D14. Rail stress data are listed in Tables D15 to D22. Stresses in reinforcing bars are listed in Tables D23 to D26. Concrete stress data are listed in Tables D29 to D30.

TABLE D1 - ENGINES MONITORED FOR DATA ANALYSIS

Date	Test Section	Test Run	Engine No.	No. of Axles	Engine Weight, lb	Wheel Load, lb
10/74	4	1	3127	4	265,000	33,100
		2	3127	4	265,000	33,100
	5	1	3127	4	265,000	33,100
		2	3127	4	265,000	33,100
	7	1	3127	4	265,000	33,100
		2	3127	4	265,000	33,100
12/74	4-1	1	3515	4	262,500	32,800
		2	8755	6	391,500	32,600
	4-2	1	5007	6	391,500	32,600
		2	3615	4	265,000	33,100
	5	1	5596	6	391,500	32,600
		2	2645	4	258,100	32,300
	5-1	1	6348	4	262,500	32,800
		2	5687	6	391,500	32,600
	7	1	5623	6	391,500	32,600
		2	6311	4	262,500	32,800
4/75	4-1	1	8795	6	391,500	32,600
		2	8773	6	391,500	32,600
	4	1	5708	6	391,500	32,600
		2	8715	6	391,500	32,600
	5	1	5607	6	391,500	32,600
		2	3605	4	265,000	33,100
	5-1	1	5679	6	391,500	32,600
		2	8725	6	391,500	32,600
	7	1	3629	4	265,000	33,100
		2	5013	6	391,500	32,600
Average Coefficient of Variation 0.8%						32,800

<u>TABLE D2 - BEAM DEFLECTIONS, SECTION 4</u>

Location		Run No.	Deflection, in.			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	West	1	-	-	0.039	0.053
	East	1	-	-	0.046	0.063
	Average	1	-	-	0.043	0.058
	West	2	-	-	0.036	-
	East	2	-	-	0.052	0.054
	Average	2	-	-	0.044	0.054
	Average	1 & 2	-	-	0.043	0.056
At Middistance Between Joints		1	-	-	0.070	0.075
		2	-	-	0.700	0.072
	Average	1 & 2	-	-	0.070	0.074

TABLE D3 - BEAM DEFLECTIONS, SECTION 4-1

Location		Run No.	Deflection, in.			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	West	1	0.059	0.049	0.101	0.137
	East	1	0.050	0.042	0.108	-
	Average	1	0.055	0.046	0.105	0.137
	West	2	0.061	0.050	0.090	0.139
	East	2	0.050	0.044	0.116	-
	Average	2	0.056	0.047	0.103	0.139
	Average	1 & 2	0.055	0.046	0.104	0.138
At Middistance Between Joints		1	0.036	0.028	0.067	0.098
		2	0.033	0.029	0.062	0.092
	Average	1 & 2	0.035	0.029	0.065	0.095

TABLE D4 - SLAB DEFLECTIONS, SECTION 5

Location		Run No.	Deflection, in.			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	West	1	0.026	0.023	0.067	0.058
	East	1	0.024	0.020	0.079	0.059
	Average	1	0.025	0.022	0.073	0.059
	West	2	0.031	0.026	0.059	0.056
	East	2	0.024	0.021	0.067	0.061
	Average	2	0.028	0.024	0.063	0.059
	Average	1 & 2	0.026	0.023	0.068	0.059
At Middistance Between Joints		1	0.020	0.014	0.060	0.045
		2	-	-	0.047	0.034
	Average	1 & 2	0.020	0.020	0.054	0.040

TABLE D5 - SLAB DEFLECTIONS, SECTION 5-1

Location		Run No.	Deflection, in.			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	West	1	-	-	0.030	0.037
	East	1	-	-	0.039	0.042
	Average	1	-	-	0.035	0.040
	West	2	-	-	0.036	0.038
	East	2	-	-	0.040	0.035
	Average	2	-	-	0.038	0.037
	Average	1 & 2	-	-	0.036	0.038
At Middistance Between Joints		1	-	-	0.028	0.037
		2	-	-	0.034	0.038
	Average	1 & 2	-	-	0.031	0.038

TABLE D6 - BEAM DEFLECTIONS, SECTION 7

Location		Run No.	Deflection, in.			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	West	1	0.043	0.048	0.126	0.188
	East	1	0.038	0.045	0.135	0.187
	Average	1	0.041	0.047	0.131	0.188
	West	2	0.050	0.055	0.115	0.181
	East	2	0.045	0.048	0.130	0.167
	Average	2	0.048	0.052	0.123	0.174
	Average	1 & 2	0.044	0.049	0.127	0.181
At Middistance Between Joints		1	0.029	0.029	0.130	0.162
		2	0.033	0.035	0.114	0.171
	Average	1 & 2	0.031	0.032	0.122	0.167

TABLE D7 - RAIL DEFLECTIONS, SECTION 4

Location	Run No.	Deflection, in.			
		10/28/74		12/10/74	4/11/75
		Creep	30 mph	30 mph	50 mph
North Rail	2	0.014	0.015	0.025	0.014
South Rail	2	0.014	0.024	0.018	0.033
Average	2	0.014	0.020	0.022	0.024

TABLE D8 - RAIL DEFLECTIONS, SECTION 5

Location	Run No.	Deflection, in.			
		10/28/74		12/10/74	4/11/75
		Creep	30 mph	30 mph	50 mph
North Rail	2	0.018	0.020	0.034	0.036
South Rail	2	0.033	0.031	0.039	0.031
Average	2	0.026	0.026	0.037	0.034

TABLE D9 - RAIL DEFLECTIONS, SECTION 7

Location	Run No.	Deflection, in.			
		10/28/74		12/10/74	4/11/75
		Creep	30 mph	30 mph	50 mph
North Rail	2	0.034	0.035	0.016	0.033
South Rail	2	0.051	0.053	0.035	0.020
Average	2	0.043	0.045	0.026	0.027

TABLE D10 - SOIL PRESSURES, SECTION 4-1

Location		Run No.	Pressure, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	North Rail	1	-	-	5.7	-
	South Rail	1	-	-	3.4	12.5
	Average	1				
	North Rail	2	-	-	7.6	11.9
	South Rail	2	-	-	5.8	13.3
	Average	2				
	Average	1 & 2	-	-	5.6	12.6
At Mid-distance Between Joints	North Rail	1	-	-	17.5	16.3
	South Rail	1	-	-	14.9	7.3
	Average	1				
	North Rail	2	-	-	24.8	20.8
	South Rail	2	-	-	34.9	6.9
	Average	2				
	Average	1 & 2	-	-	23.0	12.8

TABLE D11 - SOIL PRESSURES, SECTION 4

Location		Run No.	Pressure, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	North Rail	1	6.2	3.2	12.5	16.1
	South Rail	1	1.3	1.9	12.0	7.5
	Average	1				
	North Rail	2	5.2	3.0	12.6	9.0
	South Rail	2	0.9	2.2	13.7	5.8
	Average	2				
	Average	1 & 2	3.4	2.6	12.7	9.6
At Mid-distance Between Joints	North Rail	1	4.4	2.4	12.2	10.3
	South Rail	1	2.4	1.5	5.7	16.8
	Average	1				
	North Rail	2	3.9	2.7	17.3	9.9
	South Rail	2	2.1	1.5	8.0	18.1
	Average	2				
	Average	1 & 2	3.2	2.0	10.8	13.8

TABLE D12 - SOIL PRESSURES, SECTION 5

Location		Run No.	Pressure, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	North Rail	1	2.6	1.9	15.4	4.1
	South Rail	1	3.4	1.5	31.5	5.1
	Average	1				
	North Rail	2	10.0	8.4	11.9	4.5
	South Rail	2	1.4	0.8	25.7	4.3
	Average	2				
	Average	1 & 2	4.4	3.2	21.1	4.5
At Mid-distance Between Joints	North Rail	1	16.2	12.9	-	-
	South Rail	1	8.7	8.1	13.4	-
	Average	1				
	North Rail	2	10.3	9.5	-	-
	South Rail	2	2.8	2.2	8.3	-
	Average	2				
	Average	1 & 2	9.5	8.2	10.9	-

TABLE D13 - SOIL PRESSURES, SECTION 5-1

Location		Run No.	Pressure, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	North Rail	1	-	-	18.3	-
	South Rail	1	-	-	2.1	5.5
	Average	1				
	North Rail	2	-	-	24.0	-
	South Rail	2	-	-	3.5	6.7
	Average	2				
	Average	1 & 2	-	-	12.0	6.1
At Mid-distance Between Joints	North Rail	1	-	-	6.9	-
	South Rail	1	-	-	2.0	6.2
	Average	1				
	North Rail	2	-	-	9.9	-
	South Rail	2	-	-	3.4	8.1
	Average	2				
	Average	1 & 2	-	-	5.6	7.1

TABLE D14 - SOIL PRESSURES, SECTION 7

Location		Run No.	Pressure, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	North Rail	1	0.8	-	17.6	7.6
	South Rail	1	1.1	1.3	20.8	9.0
	Average	1				
	North Rail	2	0.2	-	10.5	8.7
	South Rail	2	0.4	-	16.7	15.7
	Average	2				
	Average	1 & 2	0.6	1.3	16.4	10.2
At Mid-distance Between Joints	North Rail	1	9.2	7.1	9.5	-
	South Rail	1	8.2	9.4	1.5	23.3
	Average	1				
	North Rail	2	5.9	6.5	4.9	-
	South Rail	2	9.5	19.1	1.1	9.1
	Average	2				
	Average	1 & 2	8.2	10.5	4.3	16.2

TABLE D15 - RAIL STRESS AT FASTENER, SECTION 4

Strain Gage Location on Cross Section	Rail Location	Rail Side	Stress, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
Top(-)	North	Field	8,342	8,996	7,320	-
	North	Gage	6,667	6,841	7,320	3,235
	South	Gage	3,633	3,508	6,177	3,761
	South	Field	4,426	4,695	8,542	4,480
	Average		5,767	6,010	7,340	3,825
Middle(-)	North	Field	1,324	2,021	-	1,346
	North	Gage	1,364	1,031	1,661	-
	South	Gage	1,290	645	1,676	-
	South	Field	-	-	-	-
	Average		1,326	1,232	1,669	1,346
Bottom(+)	North	Field	6,330	6,146	7,410	2,252
	North	Gage	5,419	7,044	7,226	2,222
	South	Gage	3,637	4,052	6,770	-
	South	Field	4,091	4,246	6,331	-
	Average		4,869	5,372	6,934	2,237

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D16 - RAIL STRESS AT FASTENER, SECTION 5

Strain Gage Location on Cross Section	Rail Location	Rail Side	Stress, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
Top(-)	North	Field	9,040	7,040	-	5,152
	North	Gage	8,572	8,313	-	5,231
	South	Gage	9,200	10,053	6,438	3,992
	South	Field	7,307	6,672	3,828	5,217
	Average		8,530	8,020	5,133	4,898
Middle(-)	North	Field	2,355	2,771	-	936
	North	Gage	1,410	1,234	-	763
	South	Gage	2,040	2,578	1,218	1,038
	South	Field	-	-	-	-
	Average		1,935	2,194	1,218	912
Bottom(+)	North	Field	6,388	7,036	3,074	4,370
	North	Gage	8,096	7,452	3,335	4,758
	South	Gage	6,990	7,028	4,176	5,257
	South	Field	7,360	7,517	4,031	4,079
	Average		7,209	7,259	3,654	4,616

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D17 - RAIL STRESS AT FASTENER, SECTION 5-1

Strain Gage Location on Cross Section	Rail Location	Rail Side	Stress, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
Top (-)	North	Field	-	-	-	4,067
	North	Gage	-	-	-	2,880
	South	Gage	-	-	5,257	-
	South	Field	-	-	5,650	3,128
	Average		-	-	5,454	3,358
Middle (-)	North	Field	-	-	-	-
	North	Gage	-	-	765	704
	South	Gage	-	-	1,479	-
	South	Field	-	-	-	-
	Average		-	-	1,122	704
Bottom (+)	North	Field	-	-	-	3,413
	North	Gage	-	-	-	1,772
	South	Gage	-	-	4,266	5,675
	South	Field	-	-	6,264	4,162
	Average		-	-	5,265	3,756

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D18 - RAIL STRESS AT FASTENER, SECTION 7

Strain Gage Location on Cross Section	Rail Location	Rail Side	Stress, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
Top (-)	North	Field	8,309	9,206	-	4,976
	North	Gage	-	4,584	5,182	5,011
	South	Gage	9,851	12,456	5,714	3,827
	South	Field	7,917	7,472	6,576	-
	Average		8,692	8,430	5,824	4,605
Middle (-)	North	Field	2,139	2,956	2,327	1,544
	North	Gage	1,142	1,001	1,257	1,600
	South	Gage	2,061	2,006	-	759
	South	Field	1,761	1,078	-	841
	Average		1,776	1,760	1,792	1,186
Bottom (+)	North	Field	9,010	9,932	4,898	-
	North	Gage	4,864	4,634	4,774	5,528
	South	Gage	8,053	8,471	5,505	-
	South	Field	7,851	8,832	5,561	4,711
	Average		7,445	7,967	5,185	5,120

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D19 - RAIL STRESS BETWEEN FASTENER, SECTION 4

Strain Gage Location on Cross Section	Rail Location	Rail Side	Stress, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
Top (-)	North	Field	6,680	6,036	-	-
	North	Gage	5,568	4,416	-	3,696
	South	Gage	8,832	7,210	5,992	3,605
	South	Field	6,114	4,824	5,432	3,593
	Average		6,799	5,634	5,712	3,698
Middle (-)	North	Field	1,405	1,192	1,380	822
	North	Gage	2,019	1,136	1,818	1,063
	South	Gage	1,927	-	1,406	824
	South	Field	1,529	1,476	1,212	-
	Average		1,720	1,268	1,454	903
Bottom (+)	North	Field	6,798	4,218	4,873	3,028
	North	Gage	4,623	5,106	-	3,660
	South	Gage	5,511	4,946	4,993	5,419
	South	Field	5,031	4,304	4,911	3,886
	Average		5,491	4,644	4,926	3,998

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D20 - RAIL STRESS BETWEEN FASTENER, SECTION 5

Strain Gage Location on Cross Section	Rail Location	Rail Side	Stress, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
Top (-)	North	Field	6,140	-	3,654	3,062
	North	Gage	5,692	5,888	-	3,637
	South	Gage	8,057	6,818	7,482	4,106
	South	Field	7,377	6,442	3,973	2,998
	Average		6,817	6,383	5,036	3,451
Middle (-)	North	Field	1,909	1,137	1,392	1,204
	North	Gage	1,258	1,285	1,508	823
	South	Gage	2,425	1,582	1,392	726
	South	Field	1,325	1,016	812	721
	Average		1,729	1,255	1,276	871
Bottom (+)	North	Field	5,770	5,770	4,582	-
	North	Gage	4,328	-	-	-
	South	Gage	4,728	3,767	4,147	4,694
	South	Field	-	-	-	3,741
	Average		4,942	4,769	4,365	4,218

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D21 - RAIL STRESS BETWEEN FASTENER, SECTION 5-1

Strain Gage Location on Cross Section	Rail Location	Rail Side	Stress, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
Top(-)	North	Field	-	-	3,651	3,238
	North	Gage	-	-	4,727	2,579
	South	Gage	-	-	6,206	5,578
	South	Field	-	-	7,250	4,156
	Average		-	-	5,459	3,888
Middle(-)	North	Field	-	-	1,843	981
	North	Gage	-	-	-	505
	South	Gage	-	-	1,160	822
	South	Field	-	-	1,450	-
	Average		-	-	1,484	769
Bottom(+)	North	Field	-	-	-	3,533
	North	Gage	-	-	-	4,005
	South	Gage	-	-	5,626	5,888
	South	Field	-	-	5,800	4,703
	Average		-	-	5,713	4,532

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D22 - RAIL STRESS BETWEEN FASTENER, SECTION 7

Strain Gage Location on Cross Section	Rail Location	Rail Side	Stress, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
Top (-)	North	Field	6,006	4,332	6,351	-
	North	Gage	6,423	5,701	-	4,084
	South	Gage	8,327	9,265	6,757	-
	South	Field	-	-	5,191	3,395
	Average		6,919	6,433	6,100	3,740
Middle (-)	North	Field	2,129	1,597	1,363	1,151
	North	Gage	1,932	1,812	1,653	1,038
	South	Gage	2,019	-	1,102	-
	South	Field	1,659	-	1,537	-
	Average		1,935	1,705	1,489	1,095
Bottom (+)	North	Field	6,936	6,721	-	-
	North	Gage	4,762	4,493	-	-
	South	Gage	5,625	4,881	5,684	-
	South	Field	6,431	5,933	5,887	-
	Average		5,939	5,507	5,786	-

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D23 - REBAR STRESS, SECTION 4

Location in Track	Strain Gage Location on Cross Section	Rail Location	Rail Side	Stress, psi			
				10/28/74		12/10/74	4/11/75
				Creep	30 mph	30 mph	50 mph
At Joint	Top (-)	North	Field	-	-	7,764	2,713
		North	Gage	-	-	-	-
		South	Gage	1,664	1,572	3,241	7,103
		South	Field	-	-	-	8,197
		Average		1,664	1,572	5,503	6,004
	Bottom (+)	North	Field	-	-	-	-
		North	Gage	-	-	-	-
		South	Gage	2,815	3,132	3,719	2,944
		South	Field	3,395	3,424	3,674	2,313
		Average		3,105	3,278	3,697	2,629
At Mid-distance Between Joints	Top (-)	North	Field	345	431	464	491
		North	Gage	-	-	667	570
		South	Gage	837	1,162	-	2,975
		South	Field	880	862	-	1,550
		Average		687	818	566	1,397
	Bottom (+)	North	Field	306	424	203	253
		North	Gage	448	312	203	426
		South	Gage	131	493	221	576
		South	Field	300	584	295	590
		Average		296	453	231	461

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D24 - REBAR STRESS, SECTION 5

Location in Track	Strain Gage Location on Cross Section	Rail Location	Rail Side	Stress, psi			
				10/28/74		12/10/74	4/11/75
				Creep	30 mph	30 mph	50 mph
At Joint	Top(-)	North	Field	448	285	1,161	-
		North	Gage	401	385	2,372	-
		South	Gage	301	435	1,349	-
		South	Field	-	-	-	-
		Average		383	368	1,627	-
	Bottom(+)	North	Field	2,008	1,790	1,252	-
		North	Gage	-	-	1,294	2,067
		South	Gage	2,037	1,576	1,067	1,091
		South	Field	2,055	1,855	1,409	1,345
		Average		2,033	1,740	1,256	1,501
At Mid-distance Between Joints	Top(-)	North	Field	633	-	-	-
		North	Gage	712	361	-	-
		South	Gage	392	272	563	463
		South	Field	417	433	-	262
		Average		539	389	563	363
	Bottom(+)	North	Field	190	317	-	-
		North	Gage	266	205	-	-
		South	Gage	552	418	385	-
		South	Field	372	434	445	-
		Average		345	344	415	-

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D25 - REBAR STRESS, SECTION 5-1

Location in Track	Strain Gage Location on Cross Section	Rail Location	Rail Side	Stress, psi			
				10/28/74		12/10/74	4/11/75
				Creep	30 mph	30 mph	50 mph
At Joint	Top(-)	North	Field	-	-	464	-
		North	Gage	-	-	-	-
		South	Gage	-	-	408	204
		South	Field	-	-	-	269
		Average		-	-	436	237
	Bottom(+)	North	Field	-	-	174	234
		North	Gage	-	-	87	-
		South	Gage	-	-	174	356
		South	Field	-	-	232	374
		Average		-	-	167	321
At Mid-distance Between Joints	Top(-)	North	Field	-	-	601	282
		North	Gage	-	-	310	420
		South	Gage	-	-	203	325
		South	Field	-	-	203	153
		Average		-	-	329	295
	Bottom(+)	North	Field	-	-	116	193
		North	Gage	-	-	87	62
		South	Gage	-	-	-	86
		South	Field	-	-	58	-
		Average		-	-	87	114

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D26 - REBAR STRESS, SECTION 7

Location in Track	Strain Gage Location on Cross Section	Rail Location	Rail Side	Stress, psi			
				10/28/74		12/10/74	4/11/75
				Creep	30 mph	30 mph	50 mph
At Joint	Top(-)	North	Field	1,091	1,091	841	6,864
		North	Gage	992	1,537	667	2,361
		South	Gage	736	-	812	2,582
		South	Field	-	-	-	-
		Average		940	1,314	773	3,936
	Bottom(+)	North	Field	1,857	2,116	2,233	6,695
		North	Gage	1,322	1,860	-	-
		South	Gage	2,137	2,273	2,929	2,643
		South	Field	2,799	2,609	3,190	1,610
		Average		2,029	2,215	2,784	3,649
At Mid-distance Between Joints	Top(-)	North	Field	694	645	1,653	2,411
		North	Gage	724	724	1,392	1,975
		South	Gage	1,148	1,349	783	3,340
		South	Field	-	-	725	3,182
		Average		855	906	1,138	2,727
	Bottom(+)	North	Field	378	441	1,566	1,605
		North	Gage	414	468	1,624	1,764
		South	Gage	1,061	1,424	667	2,727
		South	Field	1,036	1,282	783	2,965
		Average		722	904	1,160	2,265

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D27 - CONCRETE STRESS, SECTION 4

Location in Track	Strain Gage Location on Slab	Rail Location	Stress, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	Top(-)	North	36	-	20	-
		South	102	-	96	-
		Average	69	-	58	-
	Bottom(+)	North	-	-	24	-
		South	-	-	-	-
		Average	-	-	24	-
At Mid-distance Between Joints	Top(-)	North	85	106	32	29
		South	140	47	32	101
		Average	113	77	32	65
	Middle(+)	North	-	-	-	-
		South	-	-	48	65
		Average	-	-	48	65
	Bottom(+)	North	-	-	116	-
		South	-	-	404	149
		Average	-	-	260	149

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D28 - CONCRETE STRESS, SECTION 5

Location in Track	Strain Gage Location on Slab	Rail Location	Stress, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	Top (-)	North	89	63	56	-
		South	75	-	69	50
		Average	82	63	63	50
	Bottom (+)	North	57	86	59	-
		South	72	82	77	36
		Average	65	84	68	36
At Mid-distance Between Joints	Top (-)	North	26	21	-	-
		South	44	23	-	-
		Average	35	22	-	-
	Middle (+)	North	-	-	-	-
		South	28	18	-	-
		Average	28	18	-	-
	Bottom (+)	North	58	59	-	-
		South	74	76	-	-
		Average	66	68	-	-

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D29 - CONCRETE STRESS, SECTION 5-1

Location in Track	Strain Gage Location on Slab	Rail Location	Stress, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	Top(-)	North South Average	- - -	- - -	56 52 54	40 24 32
	Bottom(+)	North South Average	- - -	- - -	40 - 40	57 109 83
At Mid-distance Between Joints	Top(-)	North South Average	- - -	- - -	20 - 20	- - -
	Middle(+)	North South Average	- - -	- - -	32 - 32	- - -
	Bottom(+)	North South Average	- - -	- - -	- 44 44	- - -

(-) Stresses are Compression
(+) Stresses are Tension

TABLE D30 - CONCRETE STRESS, SECTION 7

Location in Track	Strain Gage Location on Slab	Rail Location	Stress, psi			
			10/28/74		12/10/74	4/11/75
			Creep	30 mph	30 mph	50 mph
At Joint	Top (-)	North South Average	- - -	- - -	- - -	- - -
	Bottom (+)	North South Average	- - -	- - -	- - -	- - -
At Mid-distance Between Joints	Top (-)	North South Average	86 101 94	100 65 83	236 - 236	289 - 289
	Middle (+)	North South Average	76 58 67	61 68 65	68 - 68	70 - 70
	Bottom (+)	North South Average	146 240 193	157 257 207	56 - 56	230 - 230

(-) Stresses are Compression
(+) Stresses are Tension

APPENDIX E

ACCELEROMETER DATA REDUCTION PROCEDURE

Data obtained from the accelerometers attached to the rails and ties were recorded on magnetic tapes. The tapes and a compatible tape recorder were forwarded to ENSCO, Inc. for data reduction. The approach and procedure used for accelerometer data reduction are described in this Appendix.*

A two-phase approach was proposed for the reduction of the data. The first phase was to review the data and to provide frequency domain analysis in the form of Power Spectral Densities (PSD's). A second phase was suggested to provide time domain descriptors for the recorder signals.

Initially, it was proposed to digitize the data using a FAST Fourier Transform (FFT) techique to develop analog plots of the Power Spectral Densities. However, later it was decided to proceed with a much wider frequency range than was originally discussed. The maximum frequency range of interest for the data was increased to a range of 0 to 20 KHz. To facilitate this type of analysis, a change from a digital to an analog approach was suggested. The analog approach uses a Ubiquitous Spectrum Analyzer.

Data and Data Reduction Procedure

The data to be processed consisted of recorded time histories from high frequency accelerometers. The accelerometers were attached to one rail of the railroad track and data were collected for the passing of a train consist. The accelerometers were oriented in either the vertical or lateral direction. Data were collected on a 14-channel tape recorder at a speed of 30 inches per second. This provided for a flat frequency response from 0 to 10 KHz. The accelerometers were of the high frequency variety, with flat frequency response beyond the 10 KHz bandwidth tape recorder. The arrangement of the data on

*"Data Tape Analysis," Ensco, Inc. Report prepared for the Portland Cement Association, November 1976.

tape is shown in Table E1. Scale factors for each channel are given in Table E2.

A Ubiquitous Spectrum Analyzer was used for data reduction. The data reduction system is shown in flow chart form in Figure E1.

Since it was expected that the bandwidth of data collected would be 0 to 10 KHz, this range was first considered for use. However, some of the data (particularly the data collected in January) produced a spectrum with content beyond the 10 KHz frequency. This could be a result of exceeding the linear range of operation of the tape recorder system. A 0 to 20 KHz range was used for all analysis unless the resulting spectrum showed that a smaller frequency range of the UA500 could be used. For instance, if the power spectral density produced no spectral content above 5 KHz, the data was reprocessed, using the frequency range 0 to 5 KHz.

The processing bandwidth of the UA500 Spectrum Analyzer (SA) is 1/500 of the full range frequency. Thus, for the 0 to 20 KHz range, the processing bandwidth is 40 Hz. For 5 KHz, the full scale frequency resolution is 10 Hz. To assign a full scale level to the power spectral densities generated, the following equation is used:

$$\text{Full Scale PSD} = 10\text{Log}_{10}\left\{\frac{0.79}{\beta}(V_{rms} x SF)^2\right\} - \text{Spectrum Gain Setting}$$

where β = processing bandwidth
V_{rms} = full scale input setting
SF = scale factor (g's/volt)

The full scale PSD level measured in db is relative to $1g^2_{rms}/Hz$. A data reduction sheet was generated for each power spectral density. All important parameters, including the sensitivity of the accelerometer and the various setting of the Ubiquitous Spectrum Analyzer were recorded on this data sheet. A sample data reduction form is shown in Figure E2.

In all cases, the duration of the analyzed record was 3.2 seconds. For a frequency range of 0 to 20 KHz, this provided 128 independent estimates of the PSD which were averaged by the

TABLE E1 - ARRANGEMENT OF DATA ON TAPE

FOOTAGE COUNTER	DESCRIPTION	FOR DATA SEGMENT NO.
17	"Testing 1,2,3..." (No data following)	
45	"Test Section 1, Jan. 8, 1975"	1
228	"Section 9, Run 3, Jan. 9"	2
472	"Section 8, Run 3, Jan. 9, Accelerometers"	3
732	"Section 6, Run 3, Jan. 11, Afternoon"	4
921	"Section 3, Run 3, Jan. 12"	5
1144	"Section 2, Run 3, Jan. 13"	6
1314	BEGIN CALIBRATION	7
1329	END CALIBRATION	
1548	"Section 9, Run 3, April 21, 1975"	8
1866	"Section 8, Run 3, April 22, 1975"	9
2035	"Section 6, Run 3, April 23, 1975"	10
2330	"Section 3, Run 3, April 24, 1975"	11
2648	"Section 2, Run 3, Delayed To April 25, 1975"	12
2886	"Section 1, Run 3, April 25, 1975, 5 P.M."	13

TABLE E2 - CHANNEL SCALE FACTORS

Tape Channel	Item	Calibration, g/volt	
		January Test	April Test
1	North Rail-Vertical	13.71	54.05
2	North Rail-Horizontal	15.68	60.98
3	South Rail-Vertical	13.31	51.73
4	South Rail-Horizontal	13.70	53.48
5	Tie-North End-Vertical	17.65	68.70
7	Tie-North Rail Seat-Vertical	13.91	53.69
8	Tie-Mid Length-Vertical	14.13	55.79
9	Tie-South Rail Seat-Vertical	13.89	54.80
10	Tie-South End-Vertical	13.34	52.56

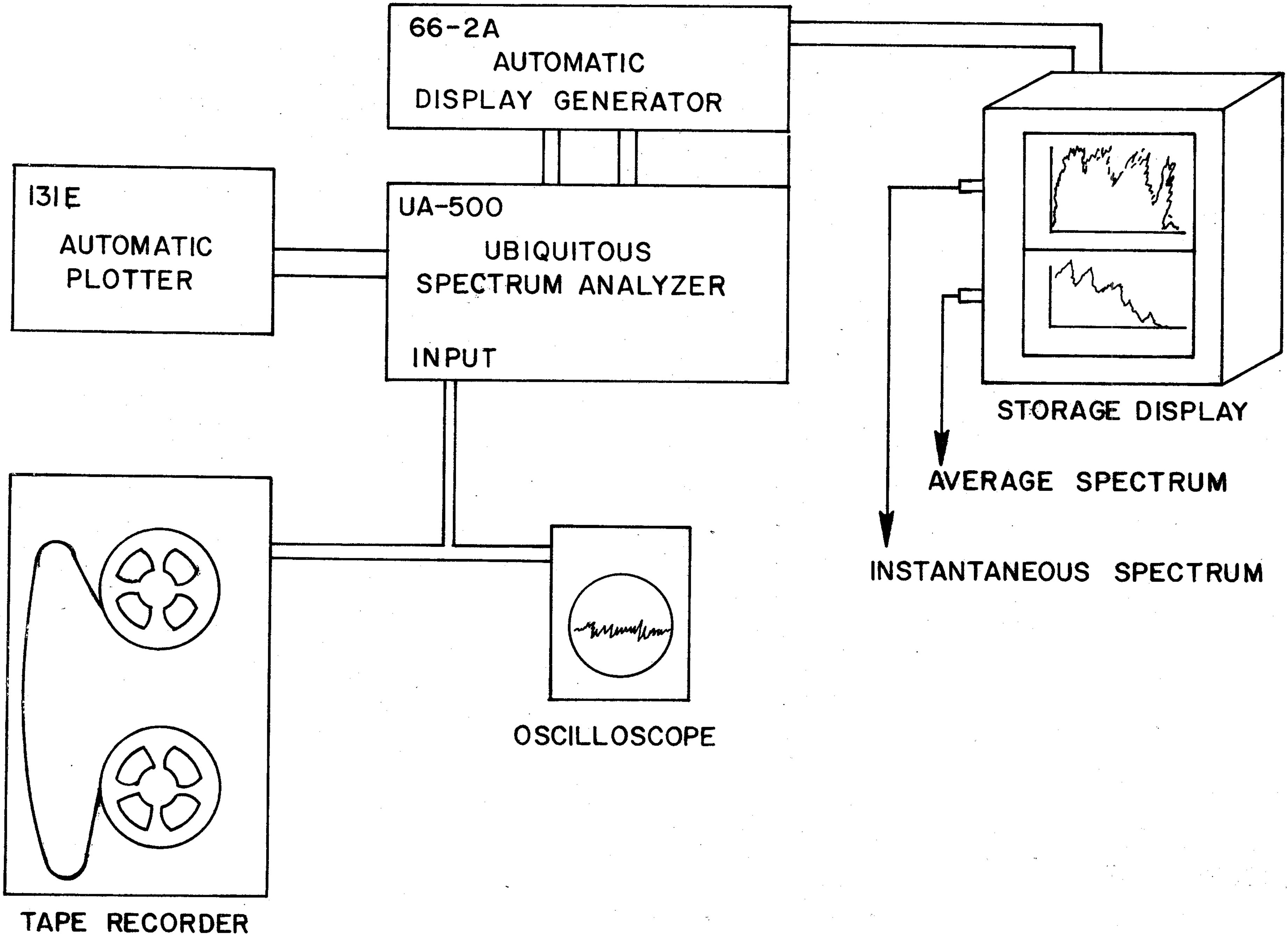


FIGURE E1 - DATA REDUCTION PROCEDURE

Date: ______________________

Operator: ______________________

Tape Recorder Channel Number: ______________________

Test Section: ______________ Collection Date: ______________

Accelerometer Scale Factor: ______________________ g/volt

UA-500-1 UBIQUITOUS SPECTRUM ANALYZER

Analysis Range: ______________________ Hz

Number of Spectra: ______________________

Averaging Method: ______________________

Instantaneous Spectrum Gain: ______________________ DB

Input Amplitude: ______________ V_{rms} Full Scale

Beta (Nominal Bandwidth): ______________________

Full Scale Spectrum Level = ______________________

$$10 \ \mathrm{Log}_{10} \left\{ \frac{0.79}{\beta} (V_{rms} * SF)^2 \right\} - \text{Spectrum Gain}$$

$$10 \ \mathrm{Log}_{10} \left\{ \frac{0.79}{\beta} \right\} + 20 \ \mathrm{Log}_{10} (V_{rms}) + 20 \ \mathrm{Log}_{10} (SF) - \text{Spectrum Gain}$$

FIGURE E2 - SAMPLE DATA REDUCTION FORM

spectrum analyzer. For the 0 to 10 KHz, 64 independent samples were available for averaging. A total of 32 samples were averaged for the 0 to 5 KHz range.

The procedure for using the data reduction signal was as follows:

1. Set up Spectrum Analyzer for expected frequency range and input level.
2. Position tape at beginning of section of interest.
3. Start tape recorder.
4. Observe oscilloscope for onset of signal.
5. Start Spectrum Analyzer.
6. Complete data sheet.
7. Plot data.

Results

Over 150 PSD curves were generated from the combination of 12 tests and the nine accelerometers per test. The format of the curves is PSD level in db (relative to $1g^2_{rms}/Hz$) versus linear frequency. The full scale range for the PSD is calculated for each curve and rounded to the nearest whole number and recorded on each curve. The Spectrum Analyzer provides approximately 60 db on dynamic range for the plots shown.

A sample length of 3.2 seconds was taken from the available data record and analyzed in all cases. The importance of the position in the total data record (beginning, middle, and end) from which the 3.2 second sample was taken, is illustrated in Figure E3. The two spectra marked "beginning spectrum" were generated by starting the Spectrum Analyzer at the beginning of the data record. These are very similar. A second PSD marked "middle spectrum" was generated by starting the Spectrum Analyzer in the middle of the data record. The third PSD was generated from a time sample taken at the end of the data record. While it has the shape of previous spectrum, it is 4 to 8 db higher in spectral level than the previous curves.

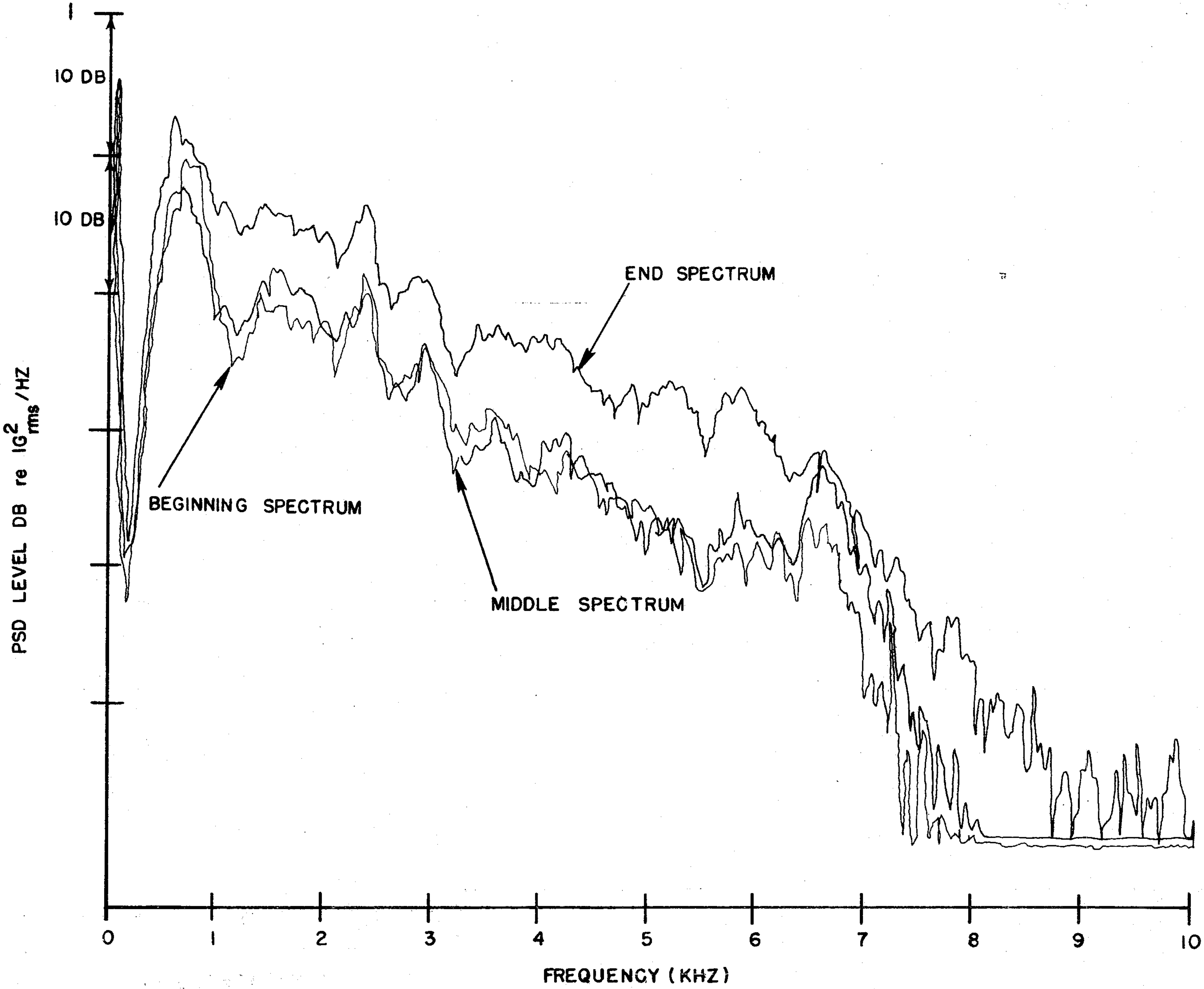


FIGURE E3 - SAMPLE DATA, SECTION 6, RUN 3, CHANNEL 7, APRIL 23, 1975

APPENDIX F
TEST TRACK INSTRUMENTATION

The purpose of this appendix is to describe and discuss the instrumentation used on the Kansas Test Track. Design, installation, and monitoring of the instrumentation are considered. In general, PCA instrumentation functioned properly. Most of the problems encountered were associated with delays in the project, adjustments and changes in the track condition, construction activities, and weather. Special emphasis is placed on those aspects needed to avoid difficulties in future work.

As outlined in Table F1, each instrument consisted of a sensor connected to a recorder through a long electrical cable. In some instances, there were intermediate items between the sensor and the long cable. These included such equipment as boxes, attenuators, zero balance units, etc. These items are identified as Box A and Box B.

At the recorder end of the cable, there was always an entry connection to the van followed by a connection to the recorder. In one case there was a power supply between van entry and recorder. This item is called Box C. Table F1 lists all instrumentation with descriptive labels for Boxes A, B, and C. Reference will be made to this table as each item is discussed.

Common Components

Instrumentation and recording equipment common to all test sections are discussed.

Electrical Cables

Seventy-five feet of our conductor shielded cable was used between the van and the sensor at the test section. Belden 8728 Strain Gage cable was used. An Amphenol MS3106A-14S-5P was used at each end of the cable. Prior to each field trip, the continuity of the four conductors and shield was checked. A cable check box was also used in the field to identify problems caused by cable open circuits.

TABLE F1 - INSTRUMENTATION COMPONENTS

SENSOR	BOX A	BOX B	BOX C	RECORDER
Shannon & Wilson Embankment				
Multiple Extensometer	Junction Box	A and Z*	-	Oscillograph
Single Extensometer	" "	A and Z*	-	"
Horizontal Extensometer	" "	Attenuate	-	"
Pressure Cell	" "	A and Z*	-	"
Tie Track Instruments				
Rail Strain	Bridge Complete	-	-	"
Tie Strain	" "	-	-	"
Load Cell Tie	Junction Cable	-	-	"
Deflection	-	-	-	"
Interface Pressure	Junction Box	-	-	"
Accelerometer	Charge Amp.	-	Power Supply	Tape Recorder
Beam and Slab Track Instruments				
Rail Strain	Junction Box	-	Bridge Com.	Oscillograph
Structure Strain	" "	-	" "	"
Rail Pressure Sensor	-	-	-	"
Deflection	-	-	-	"
Interface Pressure	Junction Box	-	-	"

*A is Attenuation and Z is zero balancing.

Most cable problems were related to weather. Electrical noise in the recordings was a problem during damp and rainy weather. Protecting the connectors from wetness by covering with plastic sheet reduced the problem. Freezing rain caused an additional mechanical interference problem, and ice also prohibited free rotation of the security ring. During cold weather, it was difficult to turn the security ring while wearing heavy gloves. These problems were solved by removal of the security ring. A new problem of accidental disconnection was then created. Careful inspection was required to reduce this possibility.

Oscillographic Recorders

Thirty-eight channels of Sanborn Carrier Type Amplifier, Oscillographic Recorders were installed in the instrument van. Recordings were made with heated stylii on plastic coated paper. A width of 50 mm was provided for each trace. Twelve channels were Model 150 in two units of six channels each. The amplifiers in these were Sanborn 150-110. Eighteen channels were Model 67A. These were in three units of six channels each. Eight channels were Model 67A in two units of four channels each. The amplifiers in these twenty-six channels were Sanborn 67A-500B.

Carrier Type Amplifiers were required to permit monitoring of the embankment Linear Variable Differential Transformers (LVDT). A noise problem was created when multiple channels of this type were used. Each channel had an oscillator to provide AC power to the sensor. Small grounding problems became major noise sources when the oscillators were not all using the same frequency. Some improvement was made by interconnecting the oscillators of the 150 series amplifiers. However, this solution also caused other problems since a minor fault on one channel could overload the oscillator and then cause all twelve channels to malfunction. The only solution was to eliminate ground resistance paths on all of the sensors. This was not always possible in wet weather.

If Carrier Type Amplifiers were necessary again in multichannel field work, a system using synchronized oscillators would avoid this problem.

Van Entry Connection

All sensors were connected at the outer surface of the Instrument Van to wiring that lead inside the recorders. Fortynine Amphenol MS3102A-14S-5P base connectors were mounted on an aluminum plate that replaced one of the van windows. Connectors on the end of the 75-ft cables plugged into these connectors. Shielded cable inside the van connected 38 circuits to Amphenol MS3106A-14S-5P connectors that matched the input recepticals on each Sanborn channel. The same cable was used on 10 circuits leading to the power supply and junction box for tape recorder inputs. One circuit was wired to marker relays for channel mark signals.

The van entry wiring was excellent in all respects.

Shannon and Wilson Instruments

Instrumentation placed in embankments by Shannon and Wilson, Inc. are discussed.

Multiple Extensometers

Connections to Linear Variable Differential Transformers (LVDT) at the main array of the instrumentation terminated in a junction box located at the edge of the embankment. Hookups for instruments recording the vertical displacement of the embankment due to train traffic were made at this junction box. Two distinct electrical circuits were required at that point to enable recording of the output of the LVDT's.

The first consisted of an attentuation circuit. Only about 5 percent of the output signal from the LVDT's could be used by the oscillographic recorders. To cut this signal down, the attenuation circuit in Figure F1 was wired into the plug-in box.

A second circuit was added to enable a wide range of electrical balancing to be applied to compensate for permanent displacement of the LVDT's from their electrical zero position.

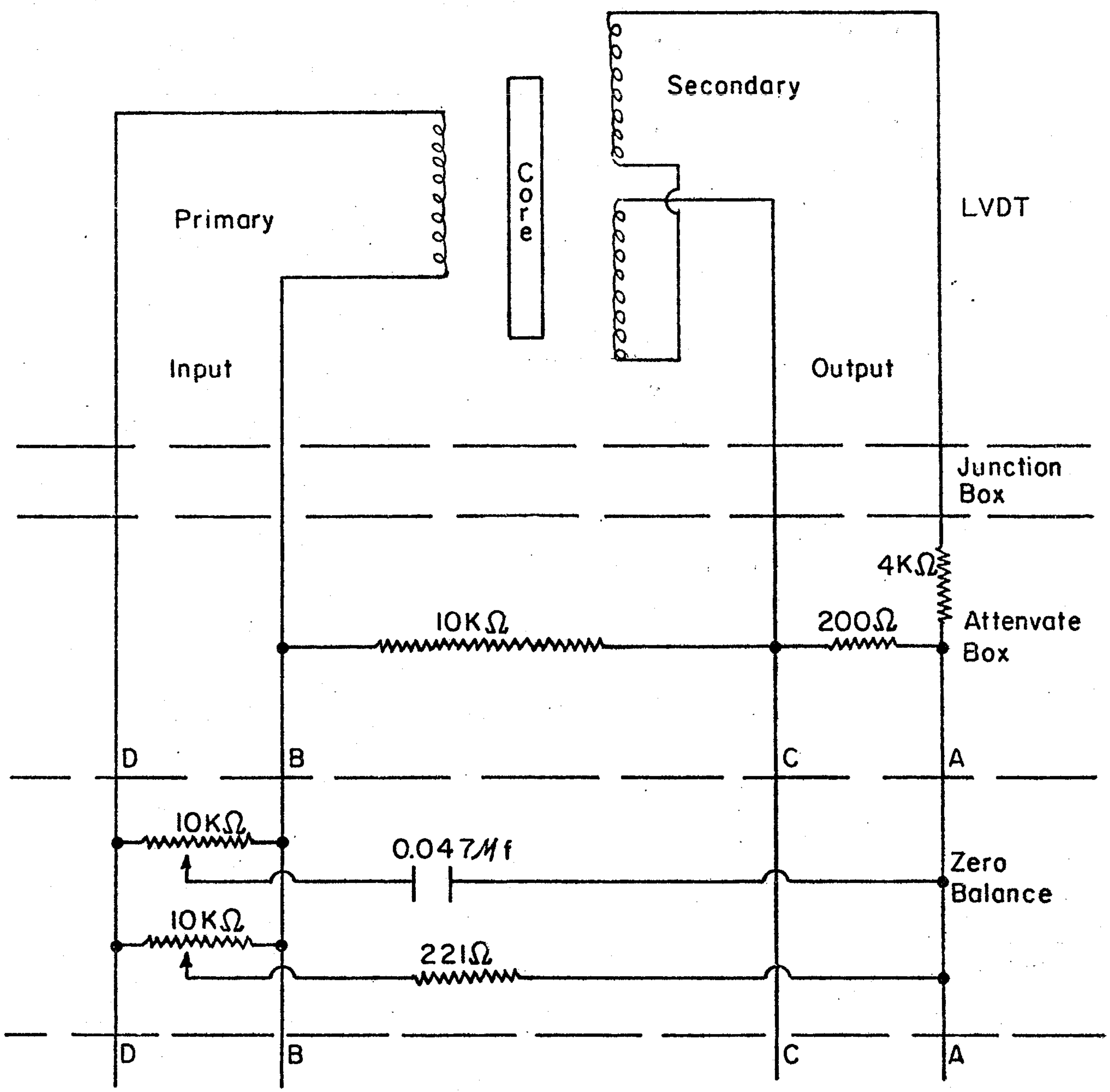


FIGURE F1 - CONNECTIONS TO EMBANKMENT SENSORS

The zero balance circuit shown in Figure F1 was connected between the 75-ft cable and the plug-in box. The zero balance circuit required adjustment to compensate for the actual offset of each LVDT. The procedure consisted of a sequence of adjustments to the two potentiometers to produce a minimum voltage between A and C. A digital voltmeter was connected to A and C through miniature pin connectors provided on the box. To provide the signal source to the LVDT for adjustment, the complete cable and recorder system were connected. Zero adjustment required about one minute per channel.

Calibration of an LVDT recorder system is usually done by moving the LVDT core through a known distance and noting recorder movement. Since there was no access to the LVDT core, it was necessary to use a substitute calibration device. The amplifier recorder system was balanced with a 4-resistor bridge circuit connected. A calibration resistance of 1 megohm in the recorder was temporarily connected in parallel with one leg of the 120-ohm resistor bridge to cause a pen deflection. The amplifier gain was than set to give a calibration pen deflection (K) of about 10 mm. Analysis of the resistance bridge indicated that the calibration signal was 0.03 millivolts per volt. The sensitivity of the amplifier-recorder system was then 0.03/K millivolts per volt per mm of pen displacement. The stated calibration factor in millivolts per volt for each LVDT was used to interpret data. This calibration factor was reduced by a predetermined amount to account for the attenuation circuit and cable resistance.

Although calibration by a substitute bridge and prior zero balancing were cumbersome and time consuming, the results were excellent.

Single Extensometers

A single LVDT was located at each of several distances from the main array and in the embankment. Electrical connection and calibration of these extensometers was the same as for the multiple extensometers. Physically, the attenuation circuit was located in the end connection at the LVDT end of an extension cable. The zero balance circuit was connected between the extension cable and the standard cable. Extension cables were in lengths of 50, 100, 150 or 150 feet. The attenuation effect due to the additional cable length was included in the total attenuation provided by the electrical circuit of Figure 1. These factors were established in the laboratory early in the program.

Horizontal Extensometers

Three horizontal extensometers with LVDT sensing elements were used for dynamic measurements. These were individually installed in holes in the embankment at each test section. At installation the LVDT was set at its electrical zero position as indicated on a Shaevitz TR-100 instrument. The electrical wires were then connected to a junction box that included the attenuation circuit shown in Figure 1. No zero balance circuit was necessary. Calibration of the recorder-amplifier system used the substitute bridge described previously.

On warm days, some minor problems were experienced with this instrumentation. A teflon sleeve inside an aluminum collar provided a sliding surface for in-out relative movement of the two ends of the horizontal extensometer. High temperature swelled the teflon and locked the device against movement. Immersing the extensometer in its embankment hole for 10 minutes prior to installation cooled the plastic and allowed proper installation.

Presssure Cells

Cables from the multiple pressure cells at the main array were terminated in the same junction box as the multiple extensometers. The pressure cells used LVDT's as the sensing element. Discussion in the section related to multiple extensometers is also applicable to the pressure cells.

Tie Track Instruments

Rail and tie strains were sensed with electrical resistance strain gages. Forces were measured with load cell ties consisting of strain-gaged sensors in a steel member designed to substitute for a concrete or timber tie. Deflections were sensed with LVDT instruments. Pressures at the interface between the ballast and the embankment were measured using Carlson pressure cells. Accelerations were sensed with piezoelectric accelerometers. Details of each of these items and the associated problems are discussed below.

Rail Strain Gages

Strain gages to sense bending strains were cemented to the gage side and the field side of the rail at selected locations. Longitudinal gages were positioned just under the rail head, at mid-height and on the top of the lower flange near the web. An epoxy cement was used to attach 20-mm long polyester-backed wire gages to the steel. Lead wires about 2-ft long were attached and a waterproofing wax was used for protection.

When data were to be collected, the lead wire was connected to a junction box. The box contained bridge completion resistors and provided a cable connector. The long cable to the van connected the full bridge to the oscillographic recorder. Calibration of each channel utilized a shunt resistance of 1 megohm across one leg of the full bridge. The pen deflection corresponding to this calibration signal was set at approximately 10 mm. Cable resistance and gage factor were used in the calculation of strain per millimeter of pen deflection according to the oscillograph operating instructions. Maximum sensitivity was about 5 millionths strain per millimeter. A well defined and accurate data trace was the usual recording for rail strain.

Recording of rail strains was affected by the environment. Time between recording sessions permitted weather to degrade the waterproofing and in some instances caused gage grounding. Also, some disappeared due to unknown actions between visits. These two problems had been anticipated and were corrected by gage testing and replacement prior to recording a set of data.

Another problem was associated with temperature change of the rail and the bridge completion box. This was caused by shade and wind as the train passed. This effect produced a drift in the recorded base line, as the wheels passed over the rail. Data reduction problems resulted from this drift.

One problem was solved by redesign. Junction boxes initially used binding posts for connection of strain gage leads. Cold weather made the binding posts difficult to handle. Also, rain froze them and pliers had to be used to connect or disconnect a wire. After the first use during freezing rain, these connections were changed to barrier terminals with screwdriver tightened connector screws.

For future studies, it would be advantageous to use a single channel to record rail curvature instead of using several channels to record strains. The advantages are several. The first is a reduction of data channels needed to get the same information. With the method used on these tests, the reduced data from 2 to 3 channels was used to calculate a curvature. If 2 gages at different levels on the rail were connected in adjacent legs of a single bridge circuit, the resulting output would be a measure of curvature. A second advantage of this method is that the bridge is temperature compensated and drift due to shade and wind are eliminated. Strain at any point in the cross section is equal to the curvature times the distance of that point from the neutral axis.

<u>Tie Strain Gages</u>

Strain gages were cemented to the sides of ties. They were located under the rail seat and at mid length and arranged to sense bending strains. Longitudinal gages were positioned on each side of the tie at one rail seat and at mid length. A gage was located near the upper face and near the lower face. An additional gage was positioned at mid height at the rail seat. An epoxy cement was used to attach 70-mm long polyester-backed electrical resistance wire gages to the concrete or timber. Lead wires about 2-ft long were attached to the gages and a waterproofing wax was used for protection.

These gages were connected and the recording equipment was calibrated in the same manner as described for the rail strains. Temperature drift was not so serious with gages on the ties, but otherwise the comments made previously apply.

Gages on the ties tended to be removed by the up-down movement of the tie and ballast as trains passed. Lower gages seldom survived between visits. Permanent bonding to the timber tie surface was not possible with the techniques used. However, short term bonding provided satisfactory results.

Load Cell Ties

Twelve load measuring sensors in the load cell tie contained full bridge strain gage circuits. The base of the tie consisted of 10 equal length sections split up to give 10 tie base forces. A force sensor under each rail seat gave the vertical component of the force entering the rail seat.

Connection to the sensor was at one end of the tie. A steel plate was removed to give access to a multi-pin connector and two 5-pin connectors. The multi-pin connector lead to the 10-base load cells. Each 5-pin connection was for one of the rail seat cells. A matching multi-pin connector lead to 10 short cables. Each cable terminated in a 5-pin connector. The long cables that lead to the recorders plugged into the 5-pin connectors. Long cables were also plugged directly into the two 5-pin connectors on the tie.

Calibration of the Model 150 series amplifiers used a setting of the factor dial. This setting was related to load-versus output calibration obtained in the laboratory. Pen displacement due to a calibration signal was set at approximately 10 mm. The usual data trace was well defined and accurate.

Electrical noise problems were encountered early in the testing. The noise was caused by the variable frequency of oscillators mentioned in the section on Oscillographic Recorders.

Water and clay was pumped into the ties by traffic action as the embankment material intruded into the ballast. This caused major problems late in the testing. The wet clay caused grounding of circuits at the connectors as well as other points. The ties had been originally designed to allow water to drain out on the assumption that the ballast would remain in good condition. A more successful design would be to seal the load cell tie against any intrusion of moisture, water, or other material.

Deflection Devices

Vertical and longitudinal displacement of the rail and vertical deflection of the tie during traffic was sensed with LVDT's. Deflection reference was two rods driven into the embankment inside tubes that isolated the rods from the embankment over their upper 5 feet.

At the time an LVDT was put in place to obtain a set of measurements, the core was positioned for zero electrical output. The LVDT had a built-in attenuation circuit so the long cable was connected directly to the short cable on the LVDT. This is in contrast to the separate attenuation and zero balance boxes provided on the embankment LVDT instrumentation described previously.

Interface Pressure Cells

Commercially available soil pressure cells were placed in a predetermined pattern under the ties at each main array. Cable from the nine cells terminated at a junction box at the edge of the embankment. Two 121-ohm resistors were wired into the circuit at the junction box to convert the half bridge from each cell to a full bridge. Long cables plugged directly into the connectors at the junction box.

Calibration of the recorded information was set by use of the 1-megohm shunt resistor in the oscillograph channel used for other strain gage bridges. Manufacturers calibration and data from a calibration at installation were used to define a calibration factor.

Problems with the pressure cells included electrical noise due to moisture at the junction box and malfunction of the cells. The electrical noise was reduced by protective covers and by removing visible moisture prior to obtaining readings.

Malfunction of cells could not be repaired. It was believed to be due to ballast pieces penetrating the sand pad on top of the cell and thereby producing errors in the recorded pressure.

Changes for future use would include a modification in installation techniques to prevent local loading of the pressure sensing diaphragm.

Accelerometers

Piezoelectric accelerometers were temporarily bolted to metal blocks that were cemented to the rail or tie. A coaxial cable 4-ft long was connected from each accelerometer to an amplifier. Long cables connected the amplifiers to input connectors at the van end. The connectors lead to the power supply and tape recorder.

Calibration of the tape recorded level consisted of recording with known voltage across the input terminals. Manufacturers calibration of the accelerometers and calibration information on the charge amplifiers were used to convert the recorded voltage to acceleration units.

Connection of the metal blocks to the ties and rails presented some problems. Aluminum blocks were glued with epoxy or polyester. Temperature changes caused the aluminum to change dimension at a different rate than the rail or tie and the blocks were lost. This required that the blocks be reattached. In future installations, compatible materials should be used.

Beam and Slab Track Instruments

Rail, reinforcing bar, and concrete strains were sensed with electrical resistance strain gages. Rail-fastener loads applied to the beams and slabs were measured with load sensors designed and built by PCA. Rail and slab deflections were sensed with strain gaged deflectometers. Pressure at the interface between the ballast subbase and the embankment was measured using Carlson pressure cells. Joint opening was measured with a Whittemore Strain Gage and a Vernier meter. Beam and slab settlement was measured with a Wild level. Details of each of these items and the associated problems will be discussed separately.

Rail Strain Gages

Prefabricated gages were used to reduce the field installation time and minimize the possibility of electrical shorts occurring during field wiring. Polyester adhesive was used to bond 5 mm-long gages to 1.00x0.25x0.005-in. phosphorous-bronze shims. Lead wires, about 2-ft long, were attached and a water-proofing wax was used for protection.

The prefabricated gages were cemented to the gage and field sides of the rail at predetermined locations to sense bending. Gages were positioned in a longitudinal direction under the rail head, at mid-height, and on the lower flange near the web. The gages were located accurately with jigs designed to position the gages and hold them firmly in place until the bonding adhesive cured. Prior to applying the gages, the rail surface was ground smooth and cleaned with acetone. Gages were attached with a polyester adhesive and coated with a final layer of waterproofing wax.

At data collection time, the lead wires were connected to terminal blocks that plugged into the cables leading to the van. Boxes containing bridge completion resistors were located inside the van. Recorder calibration was accomplished by use of a shunt resistance of 1 meghom across one leg of the full bridge. The pen deflection corresponding to this calibration signal was set at approximately 10 mm. Cable resistance and gage factors were used in the calculation of strain per millimeter of pen deflection according to the oscillograph operating instructions. The maximum sensitivity was about 5 millionths strain per millimeter.

Problems in recording rail strain were associated principally with damage to the gages between data acquisition periods. Between recording sessions, moisture caused gages to short. Also, gages disappeared due to unknown action between visits. These two problems had been anticipated and were corrected by gage testing and replacement prior to recording.

Another problem was associated with changes in rail temperature relative to the temperature of the bridge completion resistor networks located inside the instrument van. This caused the recorders to drift with time and required continuous zeroing of the recorders prior to monitoring a train. Since the time required to monitor a train was relatively small, the drift did not affect the data significantly. If readings are to be taken over a long period of time, it would be desirable to have a temperature compensated full bridge network at the rail.

Concrete Strain Gages

Prewired waterproof acrylic resin encapsulated electrical resistance strain gages were cemented to the surface of the concrete and embedded in the concrete to sense bending. Surface gages were attached with polyester adhesive. Wiring for embedded gages was carried in buried conduits to the junction boxes at the main arrays.

For recording, the gages were connected, and the recording equipment was calibrated, in the manner described for rail strains.

Some of the gages on the sides and top of the slabs and beams were damaged due to ballast tamping, modifications of the fastener systems, and general construction activities. Some top surface gages at the joints in the beams and slabs were lost due to cracking and spalling of the concrete. Wherever possible the damaged or missing gages were replaced prior to each data acquisition session. The embedded gages functioned properly in the beginning, but as the project continued electrical shorts and cross-interference began to develop. For the last two data acquisition trips, the electrical interference in some of the embedded gages was so bad they had to be disconnected to avoid affecting other instrumentation.

Reinforcing Bar Strain Gages

Strain gages were cemented to the reinforcing at various locations in the slabs and beams. Primary and redundant 5 mm long gages were applied to opposite sides of the reinforcing bars. The bar surface was ground smooth and cleaned with acetone. Gages were applied with polyester adhesive, wired, and waterproofed with a wax coating. All instrumented bars were prepared in the laboratory and shipped to the test track for installation. All gage leads were enclosed in underground conduit that led to junction boxes at the main arrays.

For recording, the wires from the van were plugged in the junction boxes and the oscillographic recorders. The recorders were calibrated in the same manner as described for the rain strain.

Generally gages on the reinforcement functioned properly. Occasionally, the primary gage did not work, and the redundant gage was used. At one of the test sections, several of the wires were cut by the construction crew during repair of the fastening system. These wires were severed inside of the concrete during the stud placement drilling operation and could not be repaired.

Rail and Slab Deflection Devices

Rail and slab deflections were sensed with PCA designed strain gage deflectometers. Slab deflections were referenced to rods driven into the embankment inside of pipes that isolated the rods from the embankment for the upper 5 ft. Rail deflections midway between fasteners were referenced to the slab.

For recording, the deflectometers were secured in place and the wires from the van were connected. The recording equipment was calibrated in the manner described for rail strains.

The deflectometer functioned perfectly and no problems were noted.

Interface Pressure Cells

Details of the soil pressure cell installation, wiring, monitoring and problems are described in the interface pressure portion of the Tie Track Instruments section of this report.

Rail Load Sensors

Rail load sensors were designed and built by PCA for monitoring the vertical and lateral loads applied by a fastener to the concrete slabs and beams. The vertical load was sensed by strain gages on the bottom of a steel plate supported on two rollers. Lateral load was sensed by two load cells.

The vertical and lateral sensors were wired separately to connectors that plugged directly into cables leading to the van. The recording equipment was balanced and calibrated in the manner described for rail strains. The sensors were calibrated in the laboratory both statically and dynamically.

Under field conditions the sensors did not function as they were designed. Variations in the location of the fastening being monitored, warped fastener bottom channels, variations in rail support between adjacent fasteners, rail loads applied through the fastener nylon stops instead of the rubber pad, and similar difficulties made it impossible to install the sensors in the field in the manner used for the laboratory calibration. In some instances the instrumented plate was not evenly supported on the two rollers. In other instances the load was transferred to the instrumented plate outside the rollers. Both cases gave erroneous results. Part way through the testing program, the load sensors were modified and loading frames were made to calibrate the sensor in place. This eliminated many of the problems and permitted the sensor to operate as designed. However, some difficulties still occurred. For future load sensors, it is recommended that vertical and lateral loads not be measured with the same sensor. Also, a spindle-load cell type of sensor should be used.

Joint Opening Plugs

Joint width measurements were taken with a Whittemore Strain Gage Meter and a Whittemore Vernier. Whittemore gage plugs were recessed into the top surface of the concrete. A waterproof was was used to seal the plugs between readings. Readings were taken once each data acquisition trip. These data provided information concerning the effect of time and climate changes on joint width.

Some Whittemore plugs were destroyed during the repair of the fastener anchoring system. When possible, plugs were reinstalled and readings with a new reference base were obtained.

Settlement Measurement

Slab and beam settlement measurements were taken at each instrumentation array. Readings were obtained with a Wild level. Brass reference plugs were recessed into the top surface of the concrete and waterproofed when not in use. Settlement readings were referenced to Invar reference rods. These rods were driven to bed rock inside tubes that isolated the upper portion of the rod from the embankment.

As in the case of the Whittemore plugs, some settlement plugs were also destroyed during the repair of the fastening system.

Post Traffic Inspection

During the month of May 1976, an inspection was made of each of the test sections to determine if conditions existed that could have adversely influenced the output of instrumentation. This work was done concurrently with a study being conducted by the Corps of Engineers.

Soil pressure cells for measuring interface pressure were exposed at the main arrays in Sections 1, 2, 3, 7, 8 and 9. In the tie track sections the cells were arranged in groups of 9, with 3 cells beneath each of two adjacent ties and 3 cells between the ties. Three of the cells were located beneath each of the rails and three beneath the track centerline. The cells were installed originally with their top surface approximately one inch below the top surface of the lime stabilized layer. A sand cushion was placed over each cell.

After the careful removal of the ballast at the cell locations and elsewhere in and near the main arrays, it was noted that the exposed surface of the lime stablilized layer presented a washboard appearance. The spacing of the parallel ridges and valleys corresponded to the spacing of the ties in that particular test section with the valleys falling directly beneath the ties. The portion of the valleys located beneath the original tamped bearing surface of the ties was much deeper than at the centerline of track. The resulting recesses in the top surface of the embankment collected both rain water and water from snow melt.

Tie spacing and ballast depth influenced the size and depth of the recesses in the top surface of the embankment. The wider the spacing the worse the condition. The shallower the ballast the worse the condition.

The soil pressure cells that were located beneath the rail seats of the two adjacent ties in the main arrays had been displaced vertically downward. This displacement was as much as 4 in. with respect to the cell located in the crib between the ties at the centerline of track. The maximum value was measured in Section 1. Lesser values on the order of 1 to 2.5 in. were measured in the other test sections.

Many of the cells had been tilted, one by as much as 15 degrees. This tilting appeared to be caused by ties not being positioned directly over the pressure cells. Instead of being at the bottom of the recesses the cells were located in the side of the recesses.

The four soil pressure cells located in the main array of Section 7 were excavated and inspected. The cell that was located beneath the south beam midway between the joints had been severely tilted and partially covered by a heavy timber wedge used to position the beam during tamping. Maintenance records kept by the Santa Fe do not show any tamping was done in that area after the initial installation of the beams. Evidence was found that the bottoms of the beams were located approximately one inch above the cell located beneath the north beam of the joint.

The main arrays in Sections 4 and 5 could not be excavated because the cast-in-place structures had not yet been removed. Several of the slabs at the west end of Section 5 had been removed, including the one which covered the soil pressure cells at secondary array 5-2. The bottom surface of these slabs were found to be very rough and irregular. Variations in the depth of the slabs of up to 6-in. were noted, particularly the slab that contained the instrumentation recesses. It is likely that a similar condition exists in the main array at 5-1.

The concrete ties in Sections 1, 2, 3 and 8 were inspected in November, 1975. All ties inspected, including one of the instrumented ties in the main array of Section 3, were cracked beneath both rails. Because only 10% of the ties were inspected at that time it could not be stated that all instrumented ties were cracked. During the post traffic inspection, the instrumented ties from the main arrays of Section 2 and 8 were inspected and determined to be cracked beneath the rail seats. All other concrete ties remaining at the test site were inspected and found to be similarly cracked. It is therefore reasonable to assume that all the instrumented ties were cracked when the track was taken out of service.

It is not known when the ties cracked. However, because 100% of the ties were cracked after 6 months of traffic, even at the narrowest tie spacing, it is probable that the ties cracked shortly after they were put in service, perhaps during the 2 weeks shakedown period. This would mean that the instrumented ties were cracked during the first and second quarterly data acquisition periods. However, they may not have been cracked during the static and slow moving load tests.

In summary the post traffic inspection revealed several conditions that adversely influenced the output of some instrumentation. These were:

1. Softening of the subgrade resulted in recesses that collected water. Soil pressure cells located in the recesses were submerged in water, mud, and ballast. Also, they were subjected to vertical and tilt displacement. Thus, the data obtained varied depending on the degree of tilt.
2. Cracking of the instrumented ties at or near the strain gages has affected the recorded strains.
3. The tilting and partial covering of a pressure cell by a timber wedge in the main array of Section 7 seriously affected the output of that cell. Similar conditions may have existed in Sections 4 and 5 where slabs and beams had not been removed at the time of inspection.
4. The rough irregular bottom surface of the slabs at secondary array 5-1 affected the output of pressure cells and strain gages. Variations in slab thickness of up to 6 inches were observed.

As the condition that existed at the time of data collection was not known, its effect on instrumentation output could not be estimated.