MODEL STUDY OF A STEEL TOWER
FOR AN EXTRA HIGH VOLTAGE SINGLE CIRCUIT TRANSMISSION LINE
LOAD TESTS AND STRAIN MEASUREMENTS
ANALYSIS OF STRESS DISTRIBUTION

A Thesis

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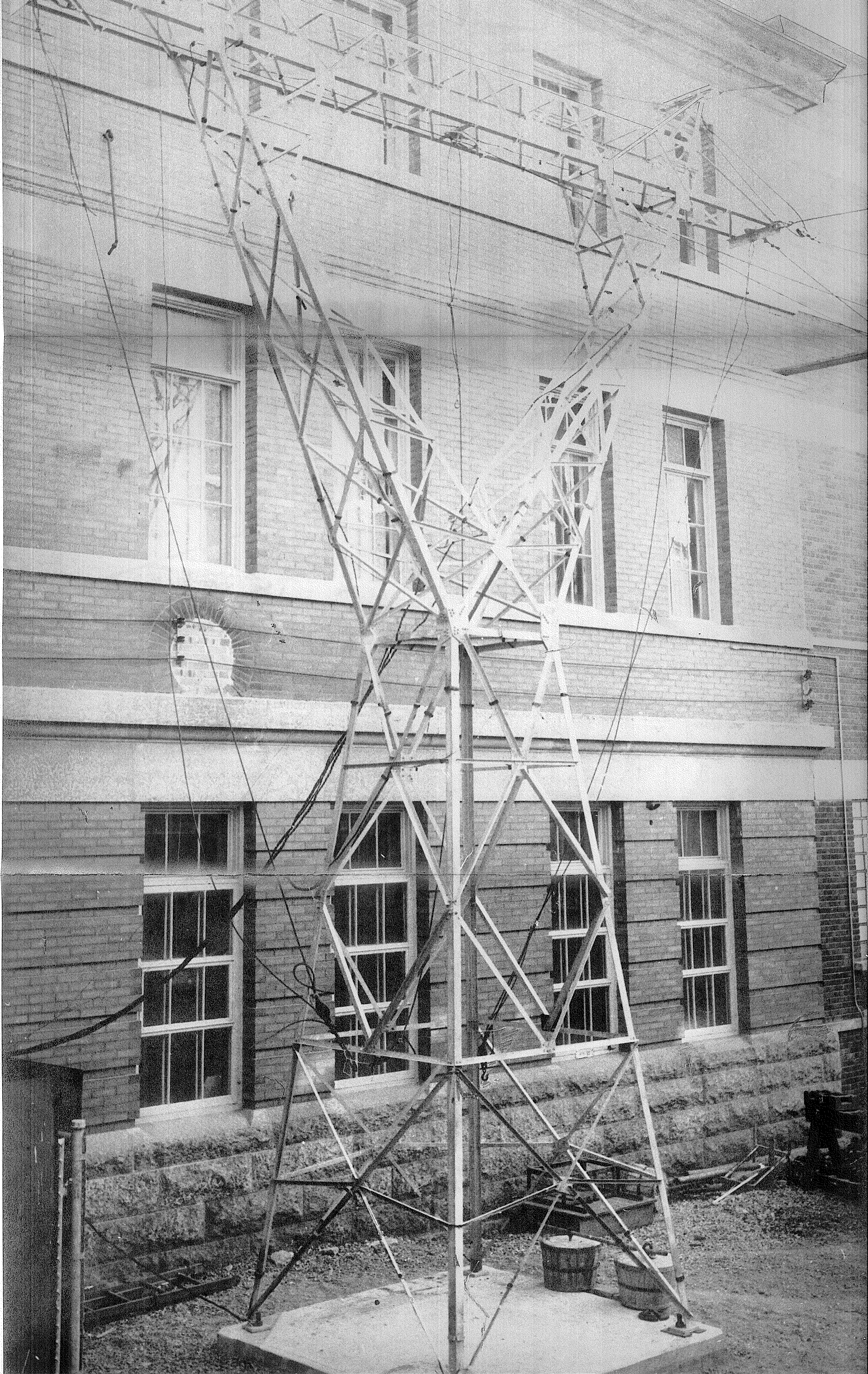

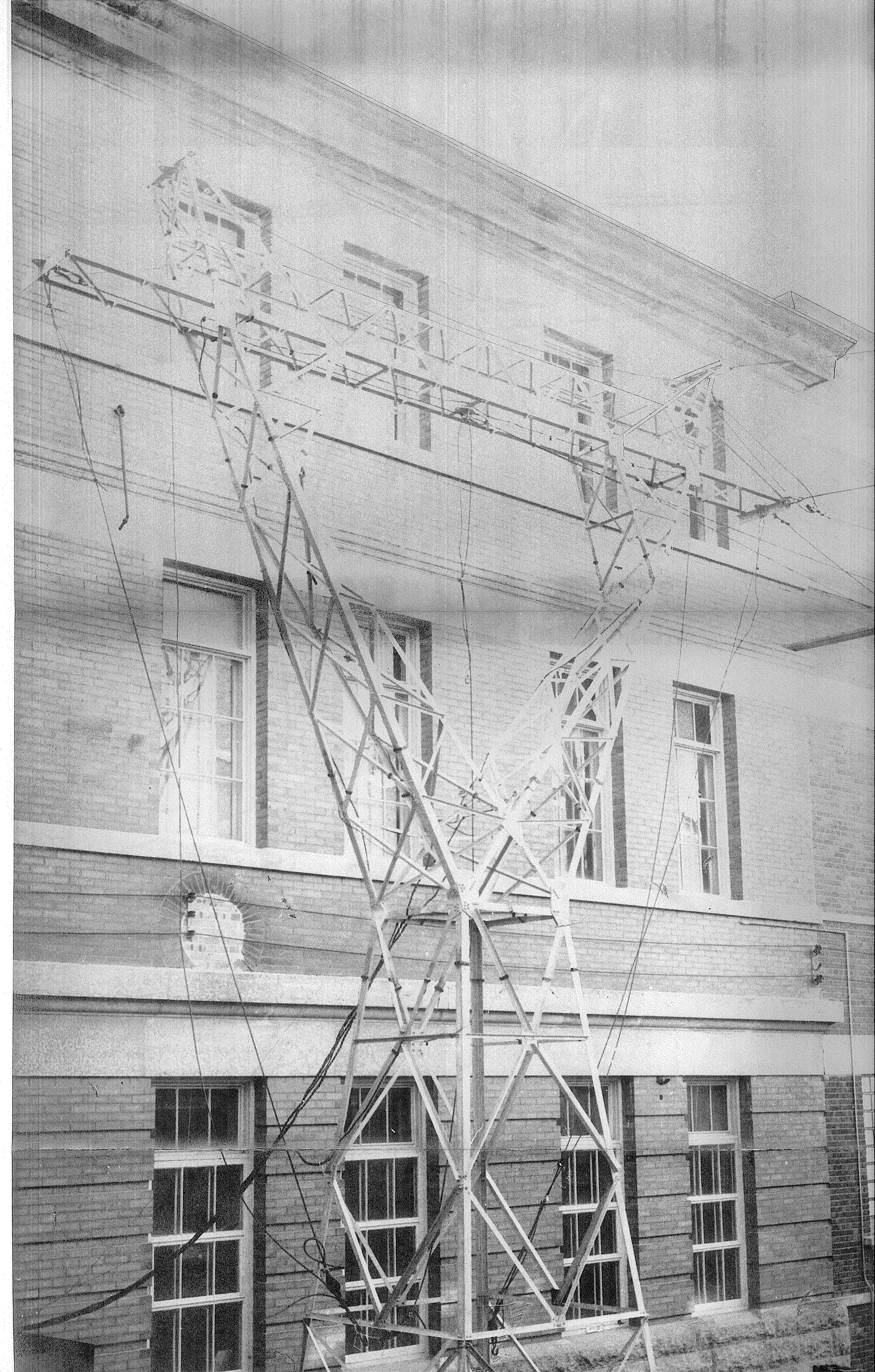

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SYNOPSIS

A 30 ft.high structural steel model transmission tower was built and a laboratory investigation was carried out to determine the actual distribution of stresses in the loaded structure.

The electrical resistance type strain gages developed to a high accuracy in the last decade, and the availability of a multichannel Digital Strain Indicator offered an excellent means of measuring strains.

The problems encountered included measurement of axial loads in angle sections,the establishment of procedures for near simultaneous measurement of strain in approximately 200 strain gages and accounting for unbalances in the mathematical analysis due to flexure and torsion in the structural members.

Work on the project commenced in March 1964. A tight time schedule and limited funds necessitated that the tasks of providing detail drawings for the structure,constructing the test site, equipping and erecting the tower be carried out by the authors.

The load tests, the evaluation of the test data, and the final stress analysis culminated in a stress distribution in the whole structure,which it is anticipated will influence favourably the future design of extra high voltage transmission line towers.

TO OUR WIVES

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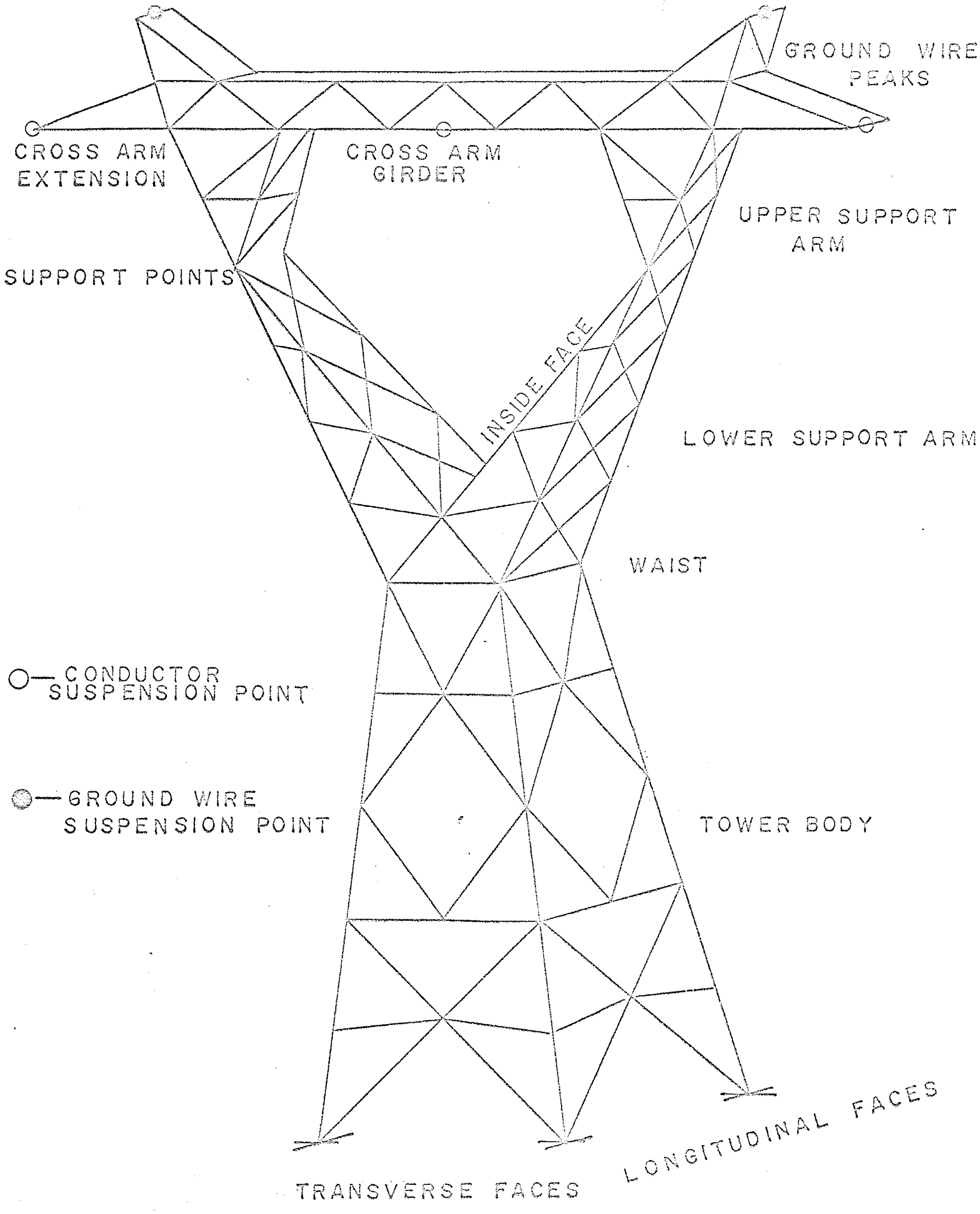


CHAPTER I

INTRODUCTION

Distant Power Developments

Advancements in electrical science have made it practicable to transmit large blocks of power over long distances. In addition to this, the vigorous growth of power demand has resulted in the development of most of the water power resources close to load centers.

Fortunately, in Canada, the available power resources are far from being exhausted although it has been necessary to develop water power resources in relatively remote areas and to transmit the power to the load centers by means of overhead transmission lines.

The apparent inability of nuclear and thermal generating systems to produce power at a cheaper rate than hydro systems will result in the construction of major water power plants in even more remote areas before the cost equilibrium is attained.

The development of the techniques of extra high voltage (EHV) power transmission was extremely helpful for the utilization of distant power resources since, by doubling or tripling the voltage[3], according to well known laws of physics (Power $= \frac{V^2}{R}$), a fourfold or ninefold amount of power can be transmitted without any increase of the cross sectional area of the conductor cable. EHV transmission enabled Electrical Utilities to build interprovincial connections of their power systems to take advantage of the time lag in the peak power demand. Also, these interconnections strengthen the reliability of the power supply having standby power available in case of power outages caused by lightning or equipment breakdown.

For these reasons the cost of constructing extra high voltage overhead transmission lines is a matter of great concern to the electrical industry.[10] On most of the important transmission lines steel towers are used and this has inspired an attempt at refinement of tower design by means of a model study.

Model Analysis

The model analysis of structures is for the modern engineer important to carry out research and development, and verify mathematical methods used to design the prototype.

For transmission line towers, a precise mathematical analysis of the structure is impractical because of too many variables and unknown factors. The transmission line tower, however, repeated as a structure many hundreds of times, is of such importance that a verification of the approximated mathematical solution is a prerequisite to eliminate any possibilities of failure.

Compared with other engineered structures such as roof trusses or bridge trusses a transmission line supporting structure is relatively flexible, and thus undergoes the largest deviation from its original shape and geometrical arrangement under applied load. Additionally, the nature of tower loading imposes large eccentric loads upon the structure causing a great variety of stress phenomena in the 100 to 150 members of the tower.

It was furthermore considered and recognized that load tests on isolated members have been conducted abundantly in the past and that the variety of analyses has reached a point of saturation from which little additional knowledge can be gleaned. It was therefore decided to conduct load tests on a model of the entire structure rather than to subject only single members, removed from the structure, to isolated load tests.

Design Problems

The governing factors in the design of power line supporting structures, as in most designs, are stress analysis and member selection. Existing methods of design contain inherent discrepancies and uncertainties concerning these basic assumptions.

The major problems with regard to stress distribution are longitudinal and torsional loading and their effect on the structure. Conventional design assumptions are inconsistent in the distribution of torsional stress in the tower body. For example, is the shear at the support point shared equally by the two longitudinal faces of the support arms and is the waist diaphragm effective in distributing torsional shears equally to all four faces below waist level?

The major problem with respect to member selection is the proportioning of members carrying a given compressive load. For example, at least thirteen allowable ultimate compression formulae are used by leading designers[11], and there is precious little research data available to guide the designer with regard to end fixity and its influence on the slenderness ratio.

Economy

The final incentive to conducting these tests is the anticipation that, as a result of a more refined method of tower analysis and design[1], towers can in the future be designed as economically as possible given a fixed set of loading conditions.

It should be borne in mind that a small reduction in weight will be magnified manifold due to the large number of towers used in transmitting power from a remote power development to a load center. A reduction in weight will reduce initial, handling and erection costs of the towers.

CHAPTER II

PRELIMINARY LABORATORY TESTS

Purpose

The preliminary tests on structural angles were conducted primarily to establish a workable orientation of strain gages on angle sections for determining axial loads. The ideal gage orientation should permit calculation of axial loads within an acceptable accuracy, and should employ a minimum number of gages.

Test Pieces

From preliminary design of the model tower the approximate size of angle sections required were known, and the following typical sections were selected for the preliminary test purposes:

1 x 1 x 3/16

2 x 2 x 1/8

2½x2½ x 3/16

The above angles were cut to length and drilled with 13/32" Ø holes on gage lines and hole to hole distances shown in Figure 2A. The steel material conformed to ASTM specification A 36 for medium structural steel.

Load Application

The above mentioned angle sections were subjected to both compression and tension tests. For the compression tests two stub ends, shown in Figure 2 A, were used to make the single or multiple 3/8" Ø bolt connections. For the tension tests a 2 x ¼" flat bar was connected with 3/8" Ø high tensile bolts to the test pieces.

The loads were applied by means of a 30,000 lb. mechanical Universal Testing Machine. This machine with its slow and constant speed

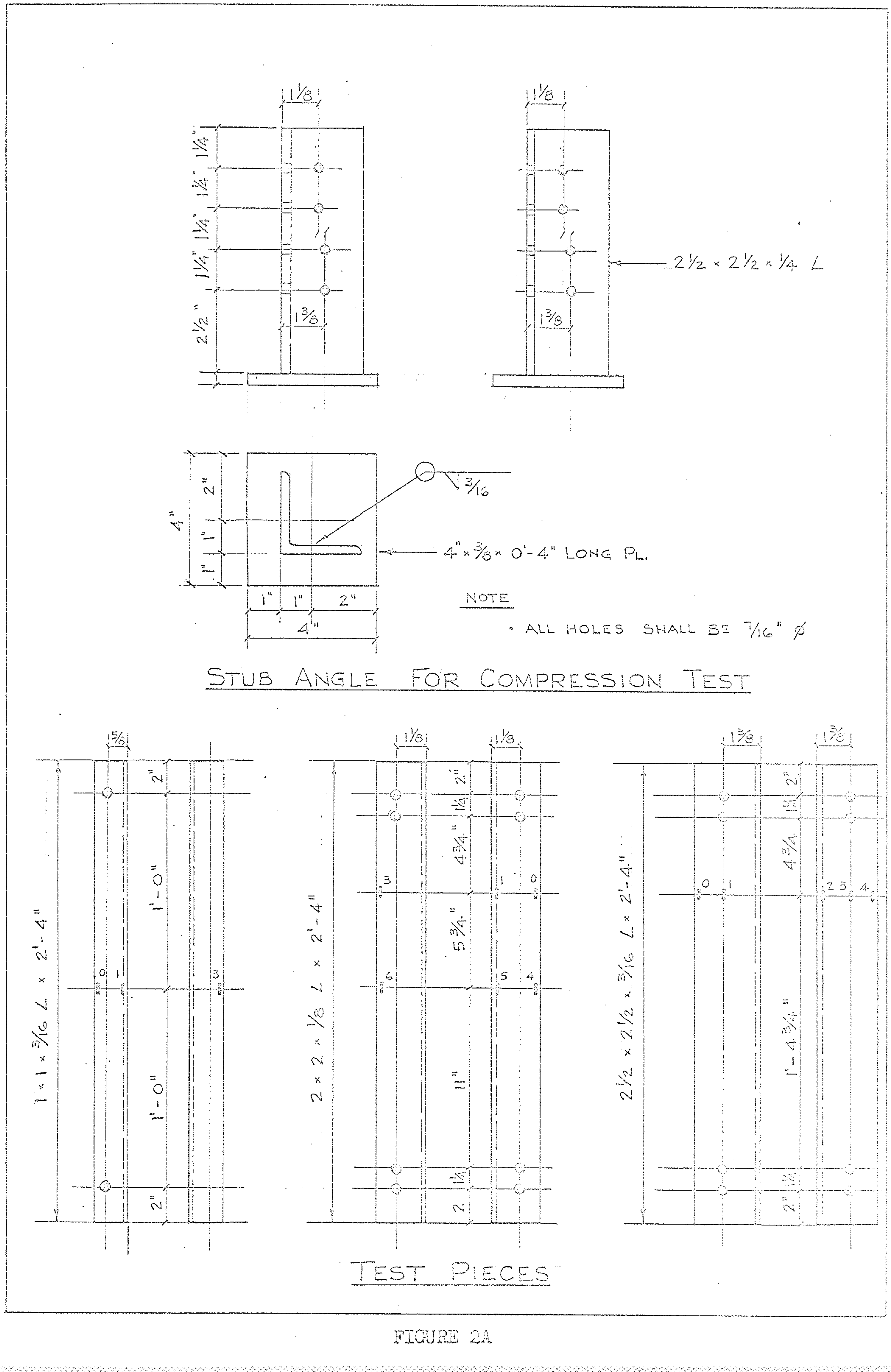

1/8
1 1/4"
1 1/4"
1 1/4"
1 1/4"
2 1/2"
1 3/8
2 1/2 × 2 1/2 × 1/4 L
3/16
4"
2"
1"
1"
1" 1" 2"
4"
4" × 3/8 × 0'-4" LONG PL.
NOTE
• ALL HOLES SHALL BE 7/16" ϕ
STUB ANGLE FOR COMPRESSION TEST
5/8
1 × 1 × 3/16 L × 2'-4"
2"
1'-0"
1'-0"
2"
2 × 2 × 1/8 L × 2'-4"
1/8
1 1/4
4 3/4"
5 3/4"
11"
2
2 1/2 × 2 1/2 × 3/16 L × 2'-4"
1 3/8
4 3/4
1'-4 3/4"
TEST PIECES

FIGURE 2A

of load application was particularly suited for these tests.

The magnitudes of applied loads were limited by the members' capacity and were applied in increments to give sufficient information regarding stress distribution at the different levels of load. Plate II A shows the test set up and the testing machine used.

Strain Measurements

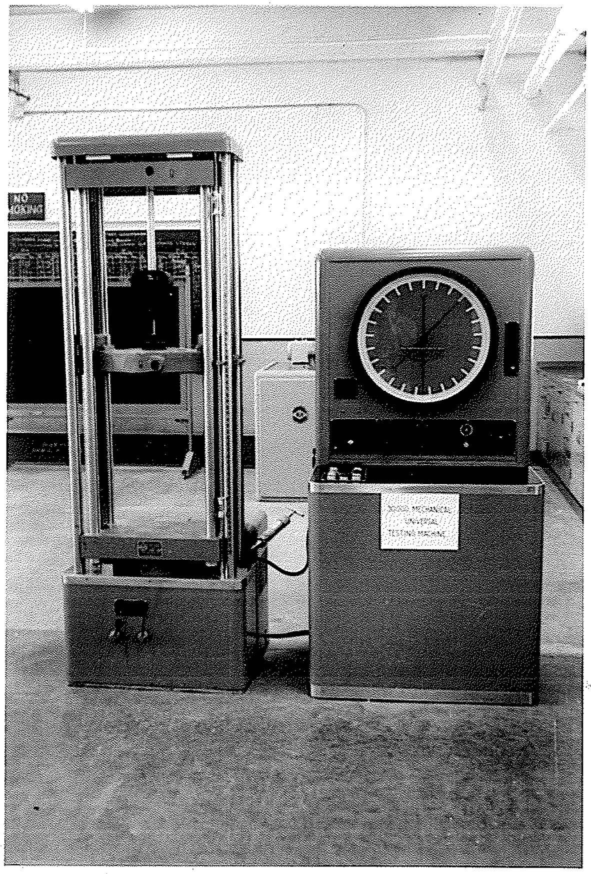
To obtain strain measurements type SR - 4 wire strain gages (manufactured by the Baldwin - Lima - Hamilton Corporation) of the $\frac{1}{4}$" size (A7) were selected because it was anticipated that their simple and reliable application and their durability in rough outdoor handling would render them suitable on the model tower members.

Based on theoretical studies the strain gages were located at the toes and at the heel of every angle section, as shown in Figure 2B and 2C. It will be noted that a minimum of three gages were placed on each cross section for reasons outlined below. The strain gages were attached to the test pieces in the method prescribed by the gage manufacturer. Strain readings were taken and recorded at every increment of load applied to the test pieces. A multichannel Digital Strain Indicator manufactured by the Budd Instrument Division was available for reading and recording of strains in microinches per inch.

Tabulation and Evaluation of Results

The strain readings, as recorded by the instrument, were tabulated on Tables IIA to IIE. Many more readings, than those shown on Tables IIA to IIE, were taken during the preliminary tests. However, to reduce the bulk of data, only typical readings are included.

Since the point of load application does not necessarily coin-



30,000 POUND MECHANICAL
UNIVERSAL TESTING MACHINE

TEST SET UP FOR
PRELIMINARY TESTING

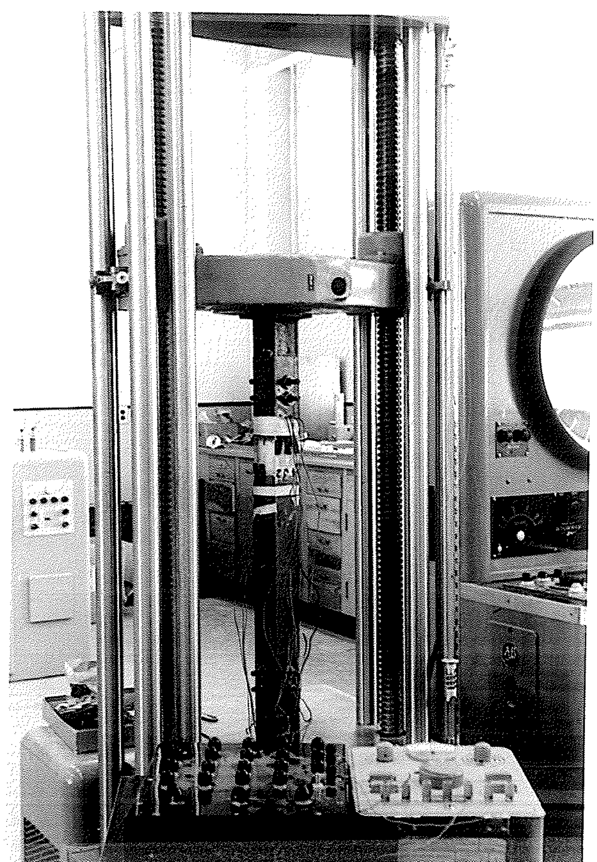
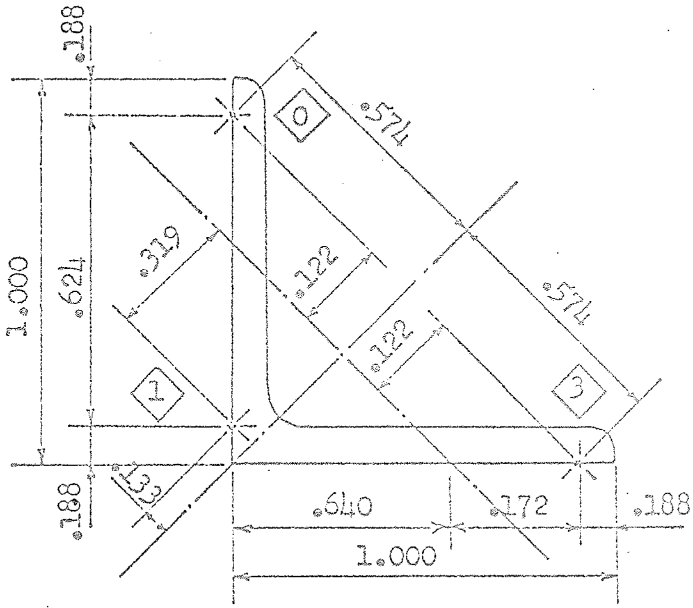


PLATE II A

PRELIMINARY TESTING

ANGLE SECTION

$1 \times 1 \times {}^{3}\!/_{16}"$



$$F_o = A - 0.122\ C + 0.574\ B$$

$$F_1 = A + 0.319\ C + 0.133\ B$$

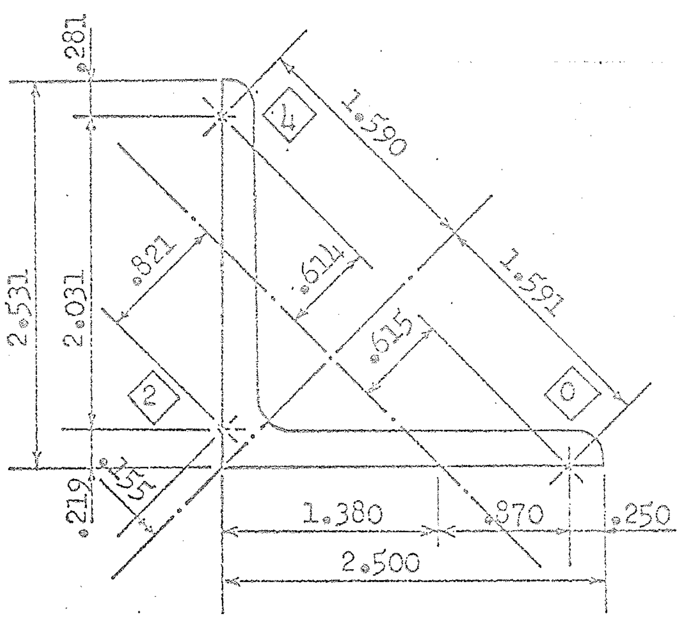
$$F_3 = A - 0.122\ C - 0.574\ B$$

$$A = 0.330\ F_o + 0.277\ F_1 + 0.394\ F_3$$

PRELIMINARY TESTING

ANGLE SECTION

$2\tfrac{1}{2} \times 2\tfrac{1}{2} \times {}^{3}\!/_{16}"$



$$F_o = A - 0.615\ C - 1.591\ B$$

$$F_2 = A - 0.821\ C - 0.155\ B$$

$$F_4 = A - 0.614\ C - 1.590\ B$$

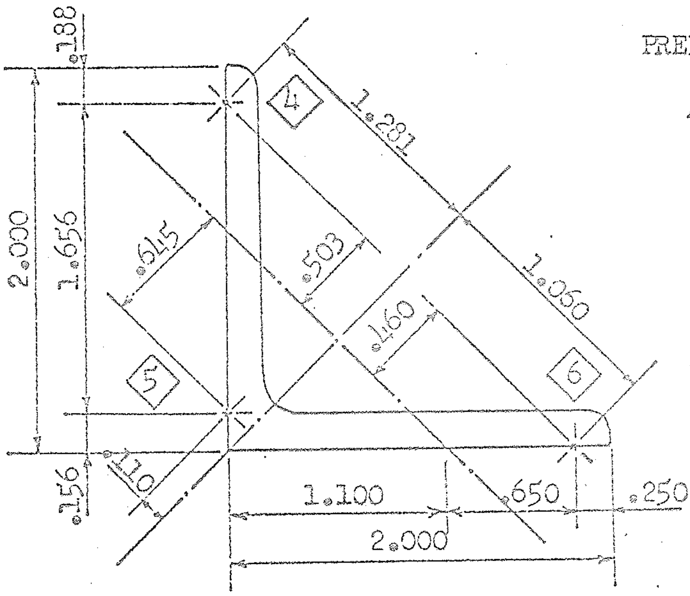
$$A = 0.307\ F_o - 0.428\ F_2 - 0.265\ F_4$$

FIGURE 2 B

PRELIMINARY TESTING

ANGLE SECTION

2 x 2 x 1/8"



$$F_4 = A - 0.503\ C + 1.281\ B$$

$$F_5 = A + 0.645\ C + 0.110\ B$$

$$F_6 = A - 0.460\ C - 1.060\ B$$

$$A = 0.239\ F_4 + 0.426\ F_5 + 0.335\ F_6$$

FIGURE 2 C

Date	May 26th 1964									May 26th 1964								
Type of Test	Tension									Compression								
Applied Load in pounds	1000			2000			3000			1000			2000			3000		
Position of Gage	0	1	3	0	1	3	0	1	3	0	1	3	0	1	3	0	1	3
Microinches: Zero Reading	000	001	002	000	001	002	000	001	002	000	000	001	000	000	001	000	000	001
Microinches: Load Reading	289	155	-107	523	350	-178	731	531	-220	-392	064	058	-591	-050	061	-811	-128	065
Microinches: Difference	289	154	-109	523	349	-180	731	530	-222	-392	064	057	-591	-050	060	-811	-128	064
Kips/ in²	8.67	4.62	-3.27	15.69	10.47	-5.40	21.93	15.90	-6.66	-11.76	1.92	1.71	-17.73	-1.50	1.80	-24.33	-3.84	1.92
Section	1 x 1 x 3/16			1 x 1 x 3/16			1 x 1 x 3/16			1 x 1 x 3/16			1 x 1 x 3/16			1 x 1 x 3/16		
Coefficients	f_0	f_1	f_3	f_0	f_1	f_3	f_0	f_1	f_3	f_0	f_1	f_3	f_0	f_1	f_3	f_0	f_1	f_3
	.112	.094	.134	.112	.094	.134	.112	.094	.134	.112	.094	.134	.112	.094	.134	.112	.094	.134
Kips	0.97	0.43	-0.44	1.76	0.99	-0.72	2.34	1.49	-0.89	-1.32	0.18	0.23	-1.98	-0.14	0.24	-2.72	-0.36	0.25
Calculated Load	0.96			2.03			2.94			0.91			1.88			2.83		
Percentage of Error	4.0			1.5			2.0			10.0			6.0			5.7		

PRELIMINARY TESTING * CALCULATION OF AXIAL LOADS

TABLE II A

Date		June 1st 1964									June 1st 1964								
Type of Test		Tension									Tension								
Applied Load in pounds		1000			2000			3000			1000			2000			3000		
Position of Gage		0	1	3	0	1	3	0	1	3	4	5	6	4	5	6	4	5	6
Microinches	Zero Reading	-002	-003	000	-002	-003	000	-002	-003	000	003	003	-001	003	003	-001	003	003	-001
	Load Reading	274	140	-080	516	328	-156	738	499	-187	190	088	-053	386	164	-098	566	247	-144
	Difference	276	143	-080	518	331	-156	740	502	-187	187	085	052	383	161	-097	563	244	-143
Kips/ in^2		8.28	4.29	-2.40	15.54	9.93	-4.68	22.20	15.06	-5.61	5.61	2.55	-1.56	11.49	4.83	-2.91	16.89	7.32	-4.29
Section		1 x 1 x ^{3}16			1 x 1 x ^{3}16			1 x 1 x ^{3}16			2 x 2 x ^{1}8			2 x 2 x ^{1}8			2 x 2 x ^{1}8		
Coefficients		f_0	f_1	f_3	f_0	f_1	f_3	f_0	f_1	f_3	f_4	f_5	f_6	f_4	f_5	f_6	f_4	f_5	f_6
		.112	.094	.134	.112	.094	.134	.112	.094	.134	.115	.204	.161	.115	.204	.161	.115	.204	.161
Kips		0.93	0.40	-0.32	1.74	0.93	-0.63	2.49	1.41	-0.75	0.65	0.52	-0.25	1.32	0.98	-0.47	1.94	1.49	-0.69
Calculated Load		1.01			2.04			3.15			0.92			1.83			2.74		
Percentage of Error		1.0			2.0			5.0			8.0			8.5			8.7		

PRELIMINARY TESTING * CALCULATION OF AXIAL LOADS

TABLE II B

Date	June 1 st 1964									May 26th 1964									
Type of Test	Compression									Compression									
Applied Load in pounds	2000			4000			5500			5000			10 000			12 500			
Position of Gage	4	5	6	4	5	6	4	5	6	0	2	4	0	2	4	0	2	4	
Microinches: Zero Reading	003	008	002	003	008	002	003	008	002	001	004	000	001	004	000	001	004	000	
Microinches: Load Reading	-119	-147	-139	-233	-323	-251	-327	-433	-359	-276	079	-539	-557	028	-852	-705	013	-969	
Microinches: Difference	-122	-155	-141	-236	-331	-253	-330	-441	-361	-277	075	-539	-558	024	-852	-706	009	-969	
Kips/ in²	-3.66	-4.65	-4.23	-7.08	-9.93	-7.59	-9.90	-13.23	-10.83	-8.31	2.25	-16.17	-16.74	0.72	-25.56	-21.18	0.27	-29.07	
Section	$2 \times 2 \times \frac{1}{8}$			$2 \times 2 \times \frac{1}{8}$			$2 \times 2 \times \frac{1}{8}$			$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$			$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$			$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$			
Coefficients	f_4	f_5	f_6	f_4	f_5	f_6	f_4	f_5	f_6	f_0	f_2	f_4	f_0	f_2	f_4	f_0	f_2	f_4	
	.115	.204	.161	.115	.204	.161	.115	.204	.161	.276	.385	.239	.276	.385	.239	.276	.385	.239	
Kips	-0.42	-0.95	-0.68	-0.81	-2.03	-1.22	-1.14	-2.71	-1.74	-2.29	0.87	-3.86	-4.62	0.28	-6.12	-5.84	0.10	-6.95	
Calculated Load	2.05			4.06			5.59			5.28			10.46			12.70			
Percentage of Error	2.5			1.5			1.6			5.6			4.6			1.6			

PRELIMINARY TESTING * CALCULATION OF AXIAL LOADS

TABLE II C

Date	May 26th 1964									May 26th 1964								
Type of Test	Compression									Tension								
Applied Load in pounds	5000			7500			10 000			1000			2000			3000		
Position of Gage	0	2	4	0	2	4	0	2	4	0	2	4	0	2	4	0	2	4
Microinches: Zero Reading	-001	-001	-003	-001	-001	-003	-001	-001	-003	001	000	001	001	000	001	001	000	001
Microinches: Load Reading	478	-184	484	668	-211	679	850	-231	876	-041	055	098	-073	102	190	-105	151	282
Microinches: Difference	479	-183	487	669	-210	682	851	-230	879	-042	055	097	-074	102	191	-106	151	281
Kips/ in^2	14.37	-5.49	14.6[illegible]	20.07	-6.30	20.46	25.53	-6.90	26.37	-1.28	1.64	2.91	-2.24	3.06	5.75	-3.18	4.53	8.43
Section	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$			$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$			$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$			$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$			$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$			$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$		
Coefficients	f_o	f_2	f_4	f_o	f_2	f_4	f_o	f_2	f_4	f_o	f_2	f_4	f_o	f_2	f_4	f_o	f_2	f_4
	.276	.385	.239	.276	.385	.239	.276	.385	.239	.276	.385	.239	.276	.385	.239	.276	.385	.239
Kips	3.97	-2.12	3.50	5.53	-2.42	4.90	7.04	-2.66	6.32	-0.35	0.63	0.70	-0.62	1.18	1.37	-0.88	1.74	2.02
Calculated Load	5.35			8.01			10.70			0.98			1.93			2.88		
Percentage of Error	7.0			6.8			7.0			2.0			3.5			4.0		

PRELIMINARY TESTING & CALCULATION OF AXIAL LOADS

TABLE II D

Date	June 1st 1964								
Type of Test	Tension								
Applied Load in pounds	1000			2000			3000		
Position of Gage	0	2	4	0	2	4	0	2	4
Microinches: Zero Reading	000	000	-002	000	000	-002	000	000	-002
Microinches: Load Reading	-028	045	096	-062	089	189	-094	138	278
Microinches: Difference	-028	045	098	-062	089	191	-094	138	280
Kips/ in^2	-0.84	1.35	2.96	-1.88	2.66	5.75	-2.82	4.14	8.40
Section	$2\frac{1}{2}$ x $2\frac{1}{2}$ x $^{3}16$			$2\frac{1}{2}$ x $2\frac{1}{2}$ x $^{3}16$			$2\frac{1}{2}$ x $2\frac{1}{2}$ x $^{3}16$		
Coefficients	f_o	f_2	f_4	f_o	f_2	f_4	f_o	f_2	f_4
	.276	.385	.239	.276	.385	.239	.276	.385	.239
Kips	-0.23	0.52	0.71	-0.52	1.02	1.38	-0.78	1.60	2.01
Calculated Load	0.99			1.88			2.83		
Percentage of Error	1.0			6.0			5.7		

PRELIMINARY TESTING * CALCULATION OF AXIAL LOADS

TABLE II E

cide with the center of gravity of the angle, the eccentric loading on the angle sections causes moments about the principal axes (w-w and z-z) which, when combined with the $\frac{\text{Load}}{\text{Area}}$ value, results in varying stresses across the angle section. The general equation for combined stresses can be written as follows:

$$F = \frac{\text{Load}}{\text{Area}} \pm \frac{M_{ww}\,(c')}{I_{ww}} \pm \frac{M_{zz}\,(c'')}{I_{zz}} \qquad \text{---(1)}$$

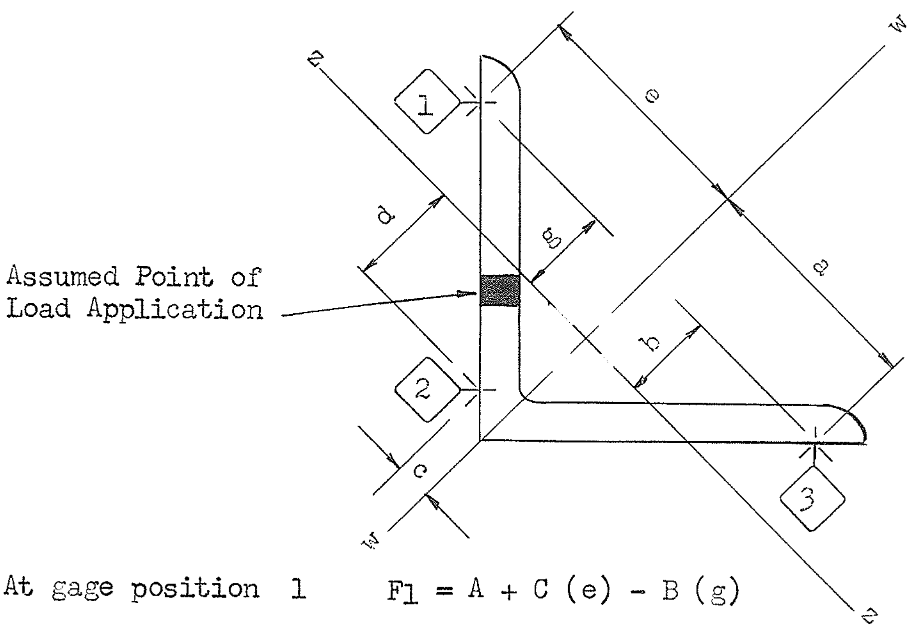
where: F = combined stress at a point

M_{ww}, M_{zz} = moments about the respective axis

I_{ww}, I_{zz} = moments of inertia about the respective axis

c', c'' = distances from the respective axes to the point

Hence, it becomes apparent that knowing the stresses at three points on a given cross section of an angle, it is possible to set up three simultaneous equations by relating the position of strain gages to the w-w and z-z axes as follows:



At gage position 1 $\quad F_1 = A + C\,(e) - B\,(g)$ ---(2)

At gage position 2 $\quad F_2 = A + C\,(c) + B\,(d)$ ---(3)

At gage position 3 $\quad F_3 = A - C\,(a) - B\,(b)$ ---(4)

where: $A = \frac{Load}{Area}$; $C = \frac{M_{ww}}{I_{ww}}$; $B = \frac{M_{zz}}{I_{zz}}$

Solving for 'A' results in the stress component corresponding to the $\frac{Load}{Area}$ value of the section. For each particular angle section the appropriate geometrical dimensions were inserted into equation (2), (3) and (4), and the three simultaneous equations were solved resulting in an equation for the $\frac{Load}{Area}$ value which is dependent on the stress measured at three known locations on the angle cross section, namely F_1, F_2 and F_3.

The geometrical dimensions and the calculated resulting equations are shown in the Figures 2 B and 2 C. The significance of each equation is that it provides a means of calculating the axial stress in angle cross sections knowing the stresses at three points on the cross section.

The stress coefficients for the final equations, shown on Table II F, were computed by multiplying the equations in Figures 2 B and 2 C by the area of the respective angle section to facilitate the calculation of axial loads.

The final equations then were used to compute the axial loads which were properly tabulated on the Tables II A to II E. A comparison of the computed loads with the applied loads indicated satisfactory results. Experimental differences ranged between 1.0 and 10.0%, with an average of 4.6% of the applied load.

It was observed that, without exception, the computed axial loads for the tension tests were lower than the applied loads, whereas the computed axial compressive loads were higher than the applied.

PRELIMINARY TESTING

EQUATIONS FOR AXIAL LOAD COMPUTATION

Angle Section	Area in^2	
1x1x^{3}16"	0.34	$\frac{\text{Load}}{\text{Area}} = 0.330\ F_o + 0.277\ F_1 + 0.394\ I_3$ $\text{Load} = 0.112\ F_o + 0.094\ F_1 + 0.134\ F_3$
2x2x^{1}8"	0.48	$\frac{\text{Load}}{\text{Area}} = 0.239\ F_4 + 0.426\ F_5 + 0.335\ F_6$ $\text{Load} = 0.115\ F_4 + 0.204\ F_5 + 0.161\ F_6$
2½x2½x^{3}16"	0.90	$\frac{\text{Load}}{\text{Area}} = 0.306\ F_o + 0.428\ F_2 + 0.265\ F_4$ $\text{Load} = 0.276\ F_o + 0.385\ F_2 + 0.239\ F_4$

TABLE II F

Strain Readings on Zinc Coated Members

Parallel to the tests of the five ungalvanized test pieces one load test was conducted on a galvanized $1\frac{1}{2}$ x $1\frac{1}{2}$ x 3/16" angle to confirm that the smooth zinc coated surface transfers the strains accurately. The computed loads again compared satisfactorily with the applied loads proving that the zinc coating does not impair the transfer of strain between the surface of the metal and the strain gage.

Conclusion

As a result of the close comparison between the axial computed load and the axial applied load in the preliminary tests, it was concluded that, by measuring the strain at three points on the cross section of an angle, the axial load can be computed with a sufficient degree of accuracy, regardless of the point of load application. It was also decided that for simplicity and uniformity the strain gages would be orientated generally as it was done in the preliminary tests.

Realizing that the location of gages has a severe influence on the calculation of axial loads, particularly for small angle sections, it was decided to put emphasis on the placing of gages accurately. It was further realized that a desirable simplification of calculations can be achieved by standardizing the location of strain gages for particular angle sections.

CHAPTER III

Selection of Tower Type

Single Circuit Towers

For hydro power developments at great distances from load centers it is generally most common to employ single circuit type transmission towers to support the power lines. This type of tower with its horizontal configuration of conductors has several advantages over the double circuit type of tower where the conductors must be arranged in a vertically staggered configuration.

The single circuit type tower allows the use of bundled conductors. Due to its lower height the occurring maximum base moments, resulting from wind loads and conductor tension, remain within limits which can be satisfied by the use of economical steel sections.

For larger power developments two single circuit arrangements have a superior reliability compared to a double circuit. In case of line maintenance one of the two single circuits can be easily de-energized and serviced during off-peak hours, whereas on the double circuit tower only half of the conductors can be de-energized. This necessitates a greater measure of precaution during the repair work.

With the growing importance of the large bundled conductor power lines as permanent carriers of energy, the Utilities try to avoid any shut down of the line for maintenance purposes. Moreover, a trend has developed towards the "hot line servicing" which can be well carried out on a single circuit tower but is hazardous if done on a double circuit tower with energized conductors above, below and beside the working lineman.

These reasons were the main influencing factors in selecting a single circuit type tower for this study.

Model Size and Similitude to the Full Size Tower

The main requirement of the planned model structure was that it behaves under applied loads in complete similarity to a full size tower. To achieve this objective, it was necessary to maintain an approximate similitude in slenderness ratio and unit stresses of the members, outline proportions, member shapes and material.

To establish the final shape of the model tower, several drawings from many highly competitive bids on the supply of transmission line towers were made available by a large Electric Utility and were used to select an optimum design.

Having established the tower outline it remained to establish a scale factor and hence the actual outline dimensions of the tower. This was based primarily on practicability and the ability to maintain a close degree of similitude with the large tower selected. Major factors were the availability of small structural angle shapes, and tower bolts (ASTM A-394) of sufficiently small sizes to permit a common bolt size for all connections.

After a number of trials, it was decided to use a scale factor of $\frac{1}{2}$, except as discussed below, which permitted the use of ^{7}8x^{7}8x^{1}8" angle shapes as a minimum size combined with 3/8" diameter bolts.

The height of the model was determined by the site. Initially it was intended that an existing wall anchor be utilized for anchoring a sheave in the longitudinal loading system. The wall anchor was located at approximately 30 feet above ground thus limiting the tower height to this dimension if undesired load components acting in other than "normal to girder axis" direction were to be minimized. Due to this limitation and the fact that the one-half scale factor applied to the prototype produced a 44 foot high tower, it was necessary to reduce this dimension. This was accomplished by in effect "cutting off" a 14 foot section from the bottom of the tower body. It should be noted that this did not disturb the similitude between prototype and model since the slope of the legs was maintained constant.

CHAPTER IV

DESIGN CRITERIA

Load Conditions

The forces to be considered in transmission line design are those due to wind pressure on the structure and conductors, and to the weight of structure, the conductors, and ice in the form of sleet adhering to the conductors.

Usually sleet storms and not wind pressure alone produce the greatest loading to which transmission line structures will be subjected and the effect of both must be considered. Wind and ice loads must be evaluated for the particular area where the line is to be installed.

The National Electric Light Association of America[4], near the turn of the century, established a specification of loading for transmission lines which has been almost universally accepted. These loading specifications are as follows:

Class A ---- (For use in ice free latitudes) 15 lb/sq.ft. on the projected area of bare cables and 25.2 lb/sq.ft. on flat surfaces.

Class B ---- (In general use in Canada) 8 lb/sq.ft. on projected area of cables encased in a $\frac{1}{2}$" thick annular ring of ice, and 13 lb/sq.ft. on flat surfaces.

Class C ---- (Used very rarely in Canada) 11 lb/sq.ft. of projected area on cables encased in a $^3/_4$" annular ring of ice and $18\frac{1}{2}$ lb/sq.ft. on flat surfaces.

The actual wind velocities[4] corresponding to these standard loadings are

Class A ---- 77.6 M.P.H.

Class B ---- 56.7 M.P.H.

Class C ---- 66.5 M.P.H.

The selected full size tower was designed to meet Class B loading condition and, being a standard suspension type tower, had to meet the longitudinal loading condition where any one of the conductors is assumed to be broken.

The magnitude of the model tower loading was chosen in direct proportion to the loading of the full size tower in ratio $\frac{1}{2.6}$ to maintain the similitude of unit stresses in the tower members. (See Figure 4 A for load combinations on the model structure).

Clearance Requirements

Under average specifications which vary with the given voltage, the phase conductor at its point of maximum sag, must clear the ground by 20 to 35 feet. This requirement fixes the height of the conductor support for any given sag and span.

The clearance of the conductor from the structural steel of the tower is based on the sparkover distance which increases with the voltage and the sideswing of the conductor suspended from the string of porcelain insulators. This requirement determines the shape of the structure in the vicinity of the conductor support point.

The spacing of the phase conductors between each other varies with the span, being dependent of the amount of sideswing of the conductors at midspan under critical conditions. The position of the overhead ground wire is determined by the degree of protection required for the phase conductor against lightning.

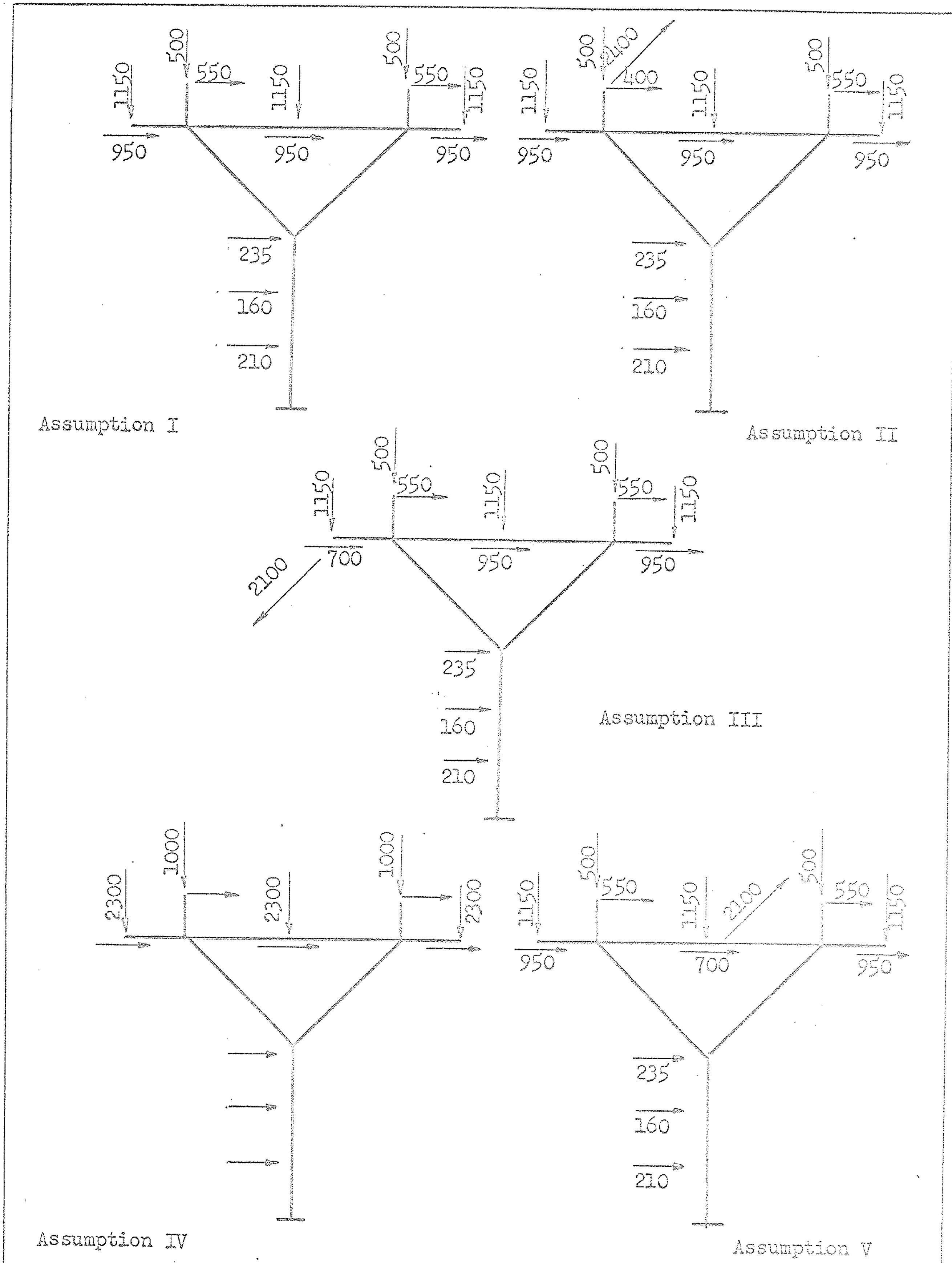


FIGURE 4 A
SUMMARY OF LOADING ASSUMPTIONS

CHAPTER V

DESIGN

Stress Diagrams and Stress Scales

Based on the tower outlines and load types described earlier, a series of unit stress diagrams were constructed (see Figures 5 A to 5 E) making it possible to determine the stresses in any or all of the tower members, except for redundants, for any or all loads by applying the proper stress scale to the respective diagrams.

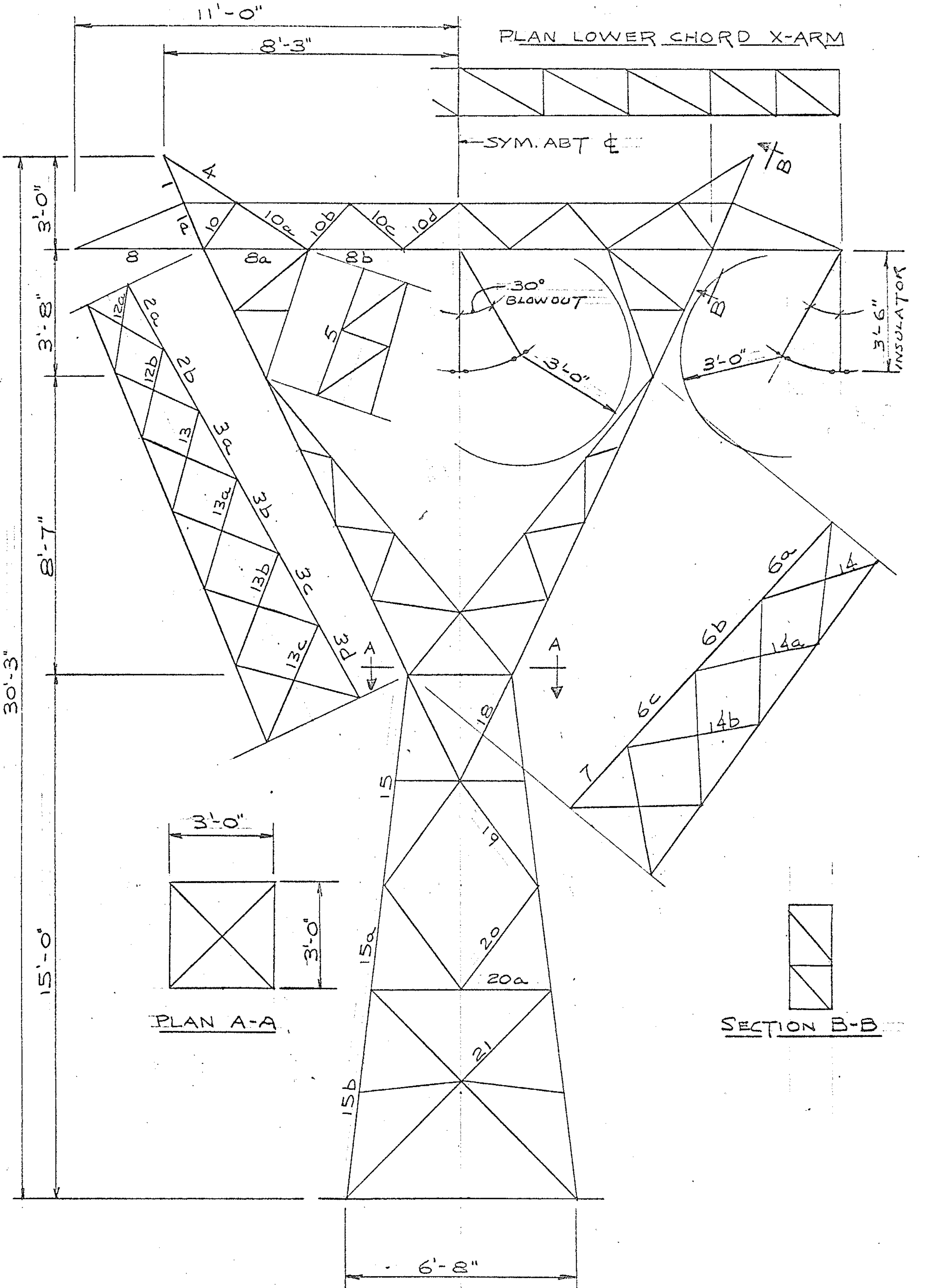
Figures 4 A and Table V A show the magnitudes and combinations of loading conditions that were considered in the design of the model tower. As mentioned in the foregoing chapters, these loads were arrived at by proportioning the loads used in the design of the full size tower so as to produce unit stresses in the model of similar magnitude to those existing in the full scale tower and, at the same time, permit the use of members with similar slenderness ratio.

It follows then, that in order to maintain full similitude between the model and the "considered best" full size tower, any assumption made regarding stress distribution must be faithfully followed in the design of the model as well.

The assumptions which were made in the design of the full size tower and which were utilized in the construction of stress diagrams and the calculation of stress scales are as follows:

(a) Longitudinal Load Applied at the Ground Wire Peak.

For this condition of loading, it is normally assumed that all of the load is transferred to the waist by the outside longitudinal face of the support arms on the loaded side of the tower. At the waist it is assumed that the diaphragm redistributes the longitudinal load equally to the two longitudinal tower faces. (See stress diagram 5).



TOWER OUTLINE AND MEMBER NUMBERS

FIGURE 5 A

STRESS DIAGRAMS

For diagram No. 1			For diagram No. 2		
Member	Location	Inches scaled	Member	Location	Inches scaled
1	Peak	1.06			
2	Upper leg	0.81	2	Upper leg	1.03
3	Upper leg	6.18	3	Upper leg	4.88
4	Peak	1.63			
5	Inner leg	2.00	5	Inner leg	1.69
6	Inner leg	5.73	6	Inner leg	4.88
7	Inner leg	5.73	7	Inner leg	4.88
8a	Bott.chord	2.38	8a	Bott.chord	0.38
8b	Bott.chord	2.83	8b	Bott.chord	1.49
9a	Top chord				
9b	Top chord	3.96	9b	Top chord	2.15
9c	Top chord	1.44	9c	Top chord	0.73
10	Diagonal	2.46	10	Diagonal	1.33
10a	Diagonal	1.17	10a	Diagonal	1.52
10b	Diagonal	1.62	10b	Diagonal	0.93
10c	Diagonal	1.80	10c	Diagonal	1.01
10d	Diagonal	1.86	10d	Diagonal	0.97
15	Leg	9.77	15	Leg	8.32
15a	Leg	9.36	15a	Leg	8.32
15b	Leg	9.14	15b	Leg	8.32
18	Diagonal	0.42			
19	Diagonal	0.30			
20	Diagonal	0.22			
20a	Strut	0.27			
21	Diagonal	0.33			

Scales of stresses

Assumption I, III, V $\quad \frac{2 \times 550}{2 \times 2} = 275^{\#}/\text{in.}$

Assumption II $\quad \frac{550 \quad 400}{2 \times 2} = 238^{\#}/\text{in.}$

Members 1, 1a for broken G.W. cond. $\quad \frac{400}{2} = 200^{\#}/\text{in.}$

Scales of stresses

Assumption I, II $\quad \frac{3 \times 950}{2 \times 2} = 713^{\#}/\text{in.}$

Assumption III, V $\quad \frac{3 \times 950 \quad 700}{2 \times 2} = 650^{\#}/\text{in.}$

DIAGRAM 1
TRANSVERSE LOADS AT GROUND WIRE

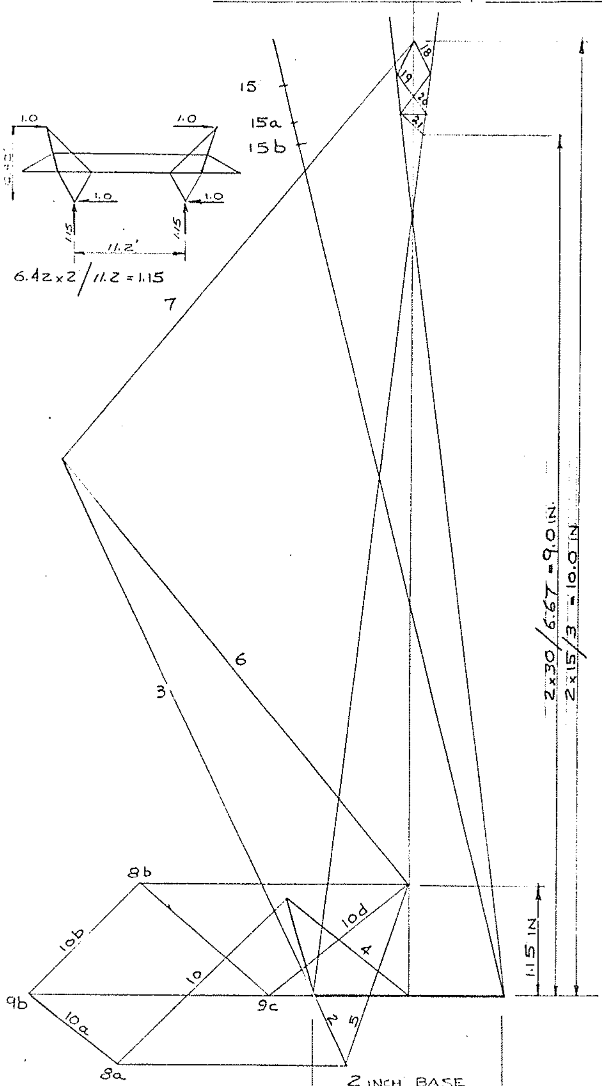
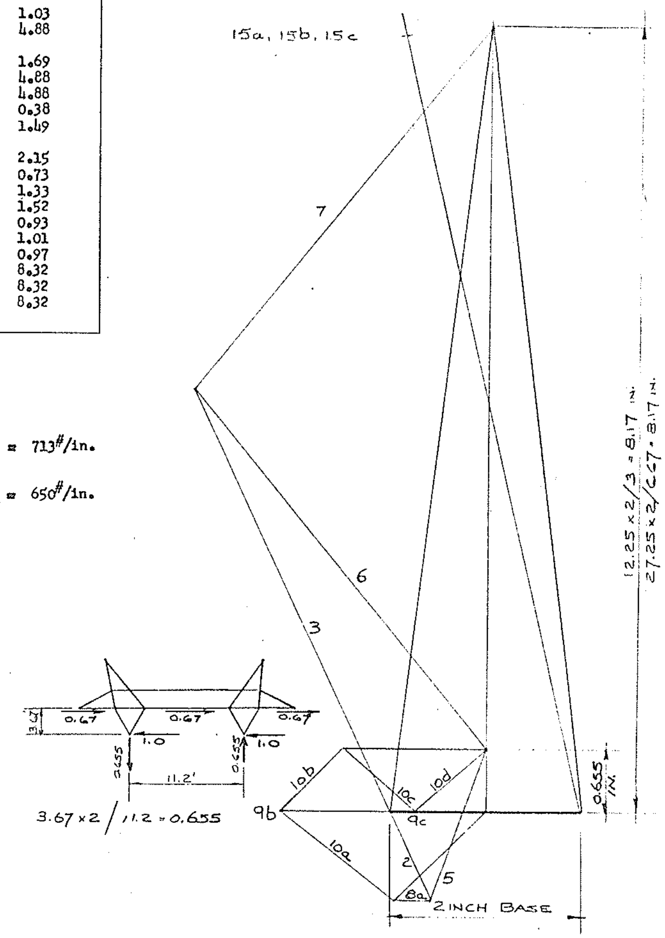


DIAGRAM 2
TRANSVERSE LOADS AT CONDUCTOR



For diagram No. 3		
Member	Location	Inches scaled
15	Leg	1.70
15a	Leg	3.58
15b	Leg	4.67
15b Torque	Leg	1.08
18	Diagonal	1.87
19	Diagonal	1.38
20	Diagonal	0.98
20a	Strut	1.16
21	Diagonal	1.49

Scales of stresses

Assumption I, II, III, V $\quad \frac{235}{2 \times 2} = 59^{\#}/\text{in.}$

Torque members 18, 19, 20, 20a, 21, 15b $\quad \frac{2100 \times 11'}{2 \times 2 \times 3'} = 1925^{\#}/\text{in.}$

DIAGRAM 3
LOADS AT WAIST LEVEL

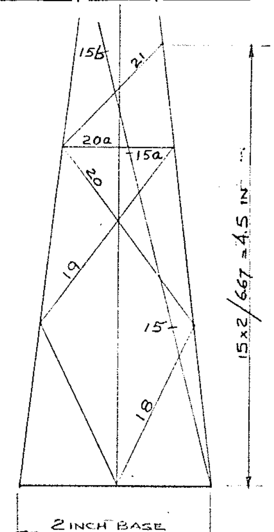


FIGURE 5 B

STRESS DIAGRAMS

DIAGRAM 4
WIND ON TOWER

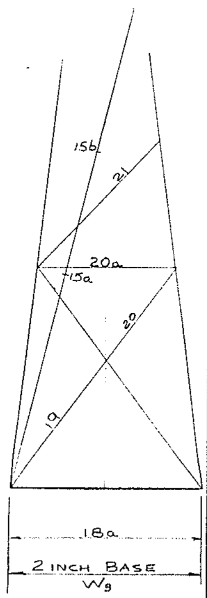
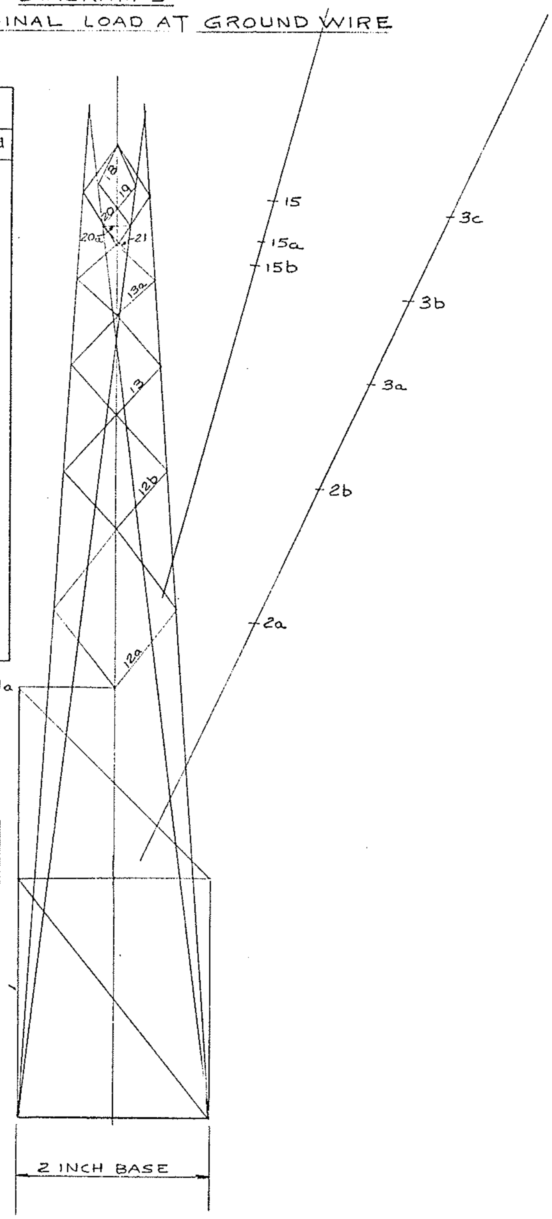


DIAGRAM 5
LONGITUDINAL LOAD AT GROUND WIRE



For diagram No. 5

Member	Location	Inches scaled
1	Peak	2.70
1a	Peak	4.53
2a	Upper leg	5.73
2b	Upper leg	7.28
3a	Upper leg	8.48
3b	Upper leg	9.44
3c	Upper leg	10.43
12	Diagonal	2.80
12a	Diagonal	1.05
12b	Diagonal	0.82
13	Diagonal	0.70
13a	Diagonal	0.57
13b	Diagonal	0.63
15	Leg	9.94
15a	Leg	9.50
15b	Leg	9.25
18	Diagonal	0.46
19	Diagonal	0.32
20	Diagonal	0.22
20a	Strut	0.28
21	Diagonal	0.35

Scales of stresses

Assumption II $\frac{2400}{2 \times 2} = 600\#/\text{in.}$

Members 1, 1a, 2-3, 12-13 $\frac{2400}{2} = 1200\#/\text{in.}$

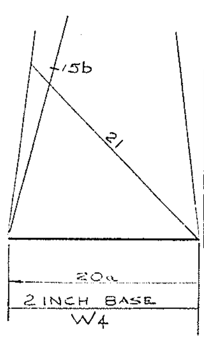
For diagram No. 4

Member	Location	Inches scaled
15a	Leg	2.30
15b	Leg	3.66
18a	Strut	2.00
19	Diagonal	1.66
20	Diagonal	1.20
20a	Strut	1.43
21	Diagonal	1.83

Scales of stresses

Assumptions I, II, III, V $\frac{160}{2 \times 2} = 40\#/\text{in.}$

DIAGRAM 4A
WIND ON TOWER



For diagram No. 4a

Member	Location	Inches scaled
15b	Leg	1.84
20a	Strut	2.00
21	Diagonal	2.53

Scales of stresses

Assumptions I, II, III, V $\frac{210}{2 \times 2} = 53\#/\text{in.}$

FIGURE 5 C

STRESS DIAGRAMS

DIAGRAM 6
LONGITUDINAL LOAD AT CONDUCTOR

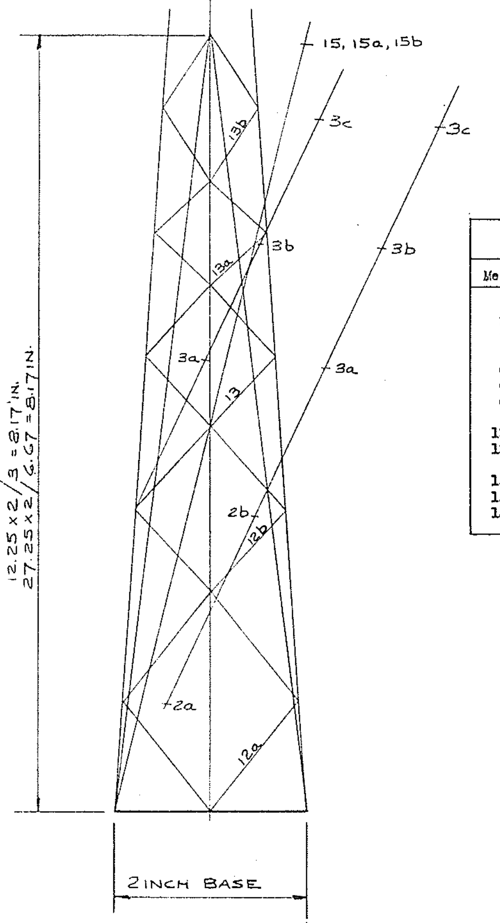
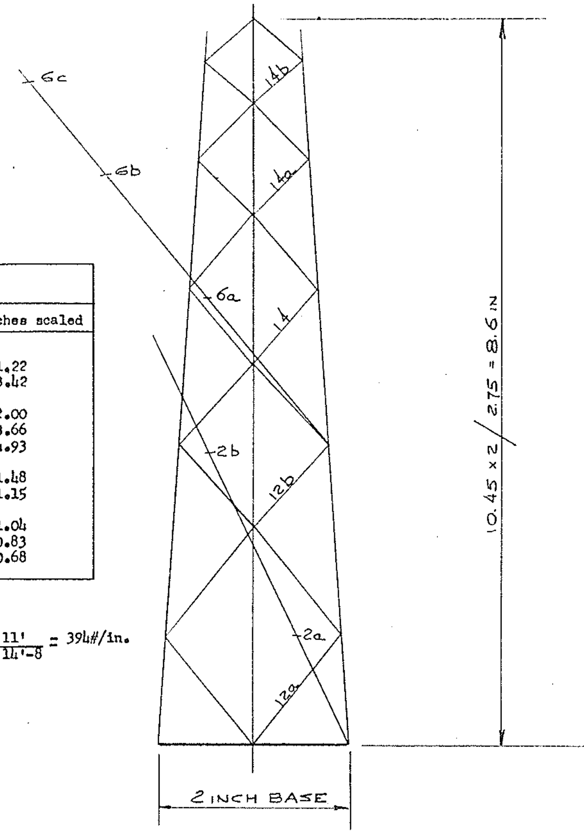


DIAGRAM 7
INSIDE FACE SUPPORT ARMS — TORSION



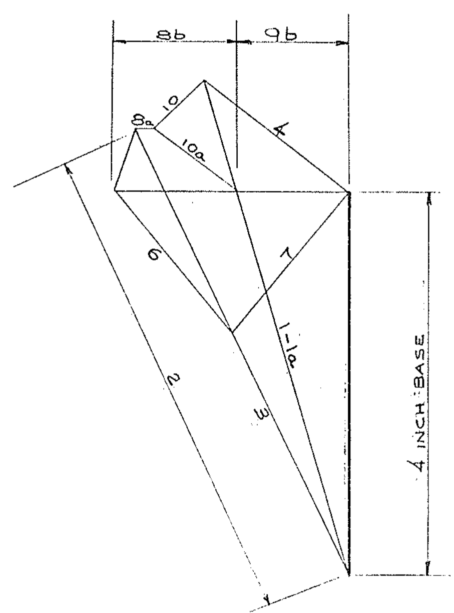
For diagram No. 7

Member	Location	Inches scaled
2a	Upper leg	1.22
2b	Upper leg	3.42
6a	Inner leg	2.00
6b	Inner leg	3.66
6c	Inner leg	4.93
12a	Diagonal	1.48
12b	Diagonal	1.15
14	Diagonal	1.04
14a	Diagonal	0.83
14b	Diagonal	0.68

Scales of stresses

Assumption III Torque only $\frac{2100 \times 11'}{2 \times 2 \times 14'\text{-}8} = 394\#/\text{in.}$

DIAGRAM 8
VERTICAL LOAD AT GROUND WIRE



For diagram No. 6

Member	Location	Inches scaled	
		O.T.M.	Torque
2a	Upper leg	1.22	1.22
2b	Upper leg	3.42	3.42
3a	Upper leg	5.14	1.72
3b	Upper leg	6.52	3.09
3c	Upper leg	7.90	4.52
12a	Diagonal	1.48	1.48
12b	Diagonal	1.15	1.15
13	Diagonal	0.98	0.98
13a	Diagonal	0.80	0.80
13b	Diagonal	0.92	0.92
15	Leg	8.28	none
15a	Leg	8.28	none
15b	Leg	8.28	see diagr. 3

Scales of stresses

Assumption III,V $\frac{2100}{2 \times 2} = 525\ \#/\text{in.}$

Assumption torque members $\frac{2100 \times 11'}{2 \times 2 \times 14'\text{-}8} = 394\ \#/\text{in.}$

For diagram No. 8

Member	Location	Inches scaled
4	Peak	1.91
2	Upper leg	5.18
3	Upper leg	2.82
5	Inner leg	0.68
6	Inner leg	1.93
7	Inner leg	1.93
8a	Bottom chord	0.20
8b	Bottom chord	1.31
9	Top chord	1.15
10	Diagonal	0.83
10a	Diagonal	1.09
1	Peak	5.39
1a	Diagonal	5.39

Scales of stresses

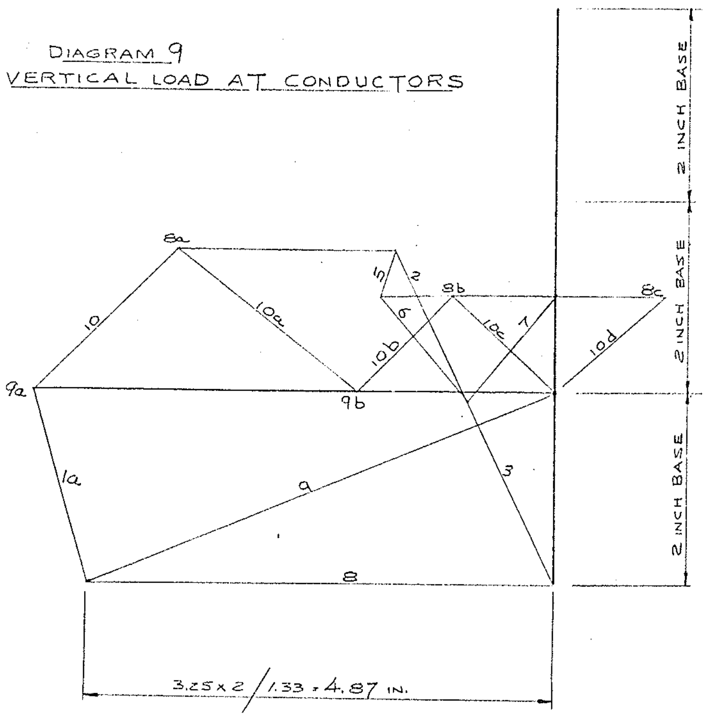
Assumption I,II,III,V $\frac{500}{2 \times 4} = 63\ \#/\text{in.}$

Assumption IV $= 125\ \#/\text{in.}$

FIGURE 5 D

STRESS DIAGRAMS

DIAGRAM 9
VERTICAL LOAD AT CONDUCTORS



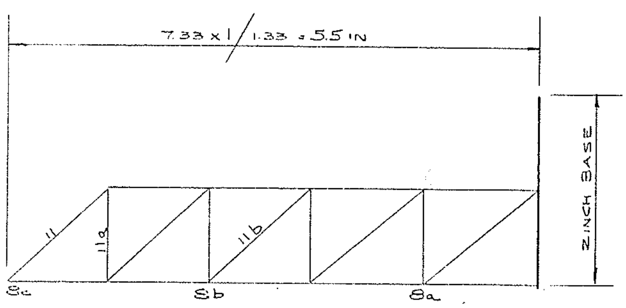
For diagram No. 9		
Member	Location	Inches scaled
1a	Diagonal	2.08
2	Upper leg	3.86
3	Upper leg	2.10
5	Inner leg	0.48
6	Inner leg	1.43
7	Inner leg	1.43
8	Bottom chord	4.88
8a	Bottom chord	2.28
8b	Bottom chord	1.10
8c	Bottom chord	1.17
9	Top chord	5.28
9a	Top chord	5.46
9b	Top chord	2.07
9c	Top chord	0
10	Diagonal	2.10
10a	Diagonal	2.38
10b	Diagonal	1.38
10c	Diagonal	1.48
10d	Diagonal	1.53

Scales of stresses

Assumptions I, II, III, V $\frac{1150 \times 3}{2 \times 6''}$ = 288#/in.

Assumption IV = 576#/in.

DIAGRAM 10a
LONGITUDINAL LOAD AT CENTRE CONDUCTOR

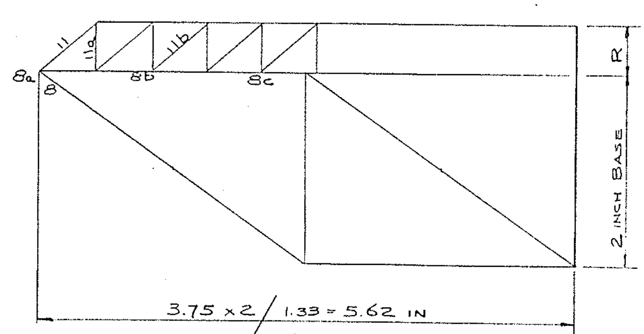


For diagram No. 10a		
Member	Location	Inches scaled
8a	Bottom chord	1.20
8b	Bottom chord	3.45
8c	Bottom chord	5.50
11	Diagonal	1.41
11a	Diagonal	1.00
11b	Diagonal	1.41

Scales of stresses

Assumption V $\frac{2100}{2}$ = 1050 #/in.

DIAGRAM 10
LONGITUDINAL LOAD AT OUTSIDE CONDUCTOR



R = 3.75 x 2 / 14.67 = 0.512 IN.

For diagram No. 10		
Member	Location	Inches scaled
8	Arm	5.70
8a	Bottom chord	5.62
8b	Bottom chord	4.42
8c	Bottom chord	3.30
11	Diagonal	0.78
11a	Diagonal	0.51
11b	Diagonal	0.78

Scales of stresses

Assumption III $\frac{2100}{2}$ = 1050 #/in.

FIGURE 5 E

TABLE V A

SUMMARY OF DESIGN LOADS FOR THE MODEL STRUCTURE

	Full Size Tower		Model Tower
(a) Vertical Loads			
(i) at ground conductor,			
dead load of conductors and hardware,	395#		
ice load on ground conductor,	755#		
arbitrary load	150#		
	1300#	----	500#
(ii) at phase conductor,			
dead load of conductors and hardware	1460#		
ice load on phase conductor,	1250#		
arbitrary load	150#		
	2860#	----	1150#
(b) Horizontal Loads Parallel to Crossarm Axis			
(i) at ground conductor			
wind on iced conductor	1130#		
2^{o} line deflection	205#		
	1335#	----	514#
Wind on model structure, concentrated at ground wire point (30 plf)		----	36#
			550#
(ii) at phase conductor			
wind on iced conductor	1790#		
2^{o} line deflection	360#		
	2150#	----	827#
Wind on model structure, concentrated at phase conductor suspension point (30 plf)		----	123#
			950#
(c) Horizontal Loads Normal to the Axis of Crossarm			
(i) at ground conductor the maximum line tension of 6400# was considered	6400#	----	2400#
(ii) at phase conductor the maximum tension for a bundle of two conductors is 11000#. Tension due to a failure of a single conductor was used	5500#	----	2100#

TABLE V A (CONTINUED)

SUMMARY OF DESIGN LOADS FOR THE MODEL STRUCTURE

	Full Size Tower	Model Tower
(d) Wind Loads on Model Structure		
Wind per lin.ft. of model structure		
between base and waist 35 plf		
between waist and crossarm 30 plf		
results in a concentrated wind load		
6'-0 above tower base		210#
12'-0 above tower base		160#
15'-0 above tower base, at waist level		235#

The twisting effect of the eccentric line pull is calculated by employing a moment arm measured from the tower center line to the ground wire peak, and is assumed to be resisted equally by all four faces of the tower body. (See stress diagram 3).

(b) Longitudinal Load Applied at one Outside Conductor Support Point.

For this load case, it is conventionally assumed that the longitudinal shear is carried down to the waist level by way of the two outside longitudinal faces of the support arms, and that the torque, calculated similar to (a) above is transmitted to the support point by the outside face of the upper support arm and is transmitted from the support point to the waist equally by the outside and the inside faces of the lower support arms. (See stress diagrams 6 and 7).

Assumptions made regarding stress transmission down from the waist are similar to those made for the longitudinal loading at the ground wire peak. (See stress diagrams 3).

(c) General Presumption.

A general basic presumption made[9] in the entire stress analysis which permitted the construction of stress diagrams is that all tower members are pin connected. This basic assumption also makes possible the static solution of the tower for transverse and vertical loads. (See diagrams 1 and 2 for transverse loading, and diagrams 7 and 9 for vertical loading).

(d) Wind on Tower Structure.

Included on Figure 5 C are a number of stress diagrams for wind on the tower structure. These were constructed on the basis of having concentrated the uniform load at a number of panel points over the height of the tower, thereby obtaining the approximate distribution of stresses due to wind on the structure. (See stress diagrams 4 and 4a).

All stress scales shown on Figures 5B to 5 E for the respective unit stress diagrams are calculated simply by dividing the design load by the diagram base dimension and by the number of faces assumed to be effective in the resistance of the applied load. The actual member stress for a given load may then be assessed by multiplying the scaled length on the unit stress diagram for the member in question by the appropriate stress scale.

Compression Formulae

For long compression members buckling (failure by bending) is a primary consideration. In buildingsand heavy construction, the main forms of buckling considered in design are column buckling (which governs the allowable stress $\frac{P}{A}$ by virtue of the slenderness ratio $\frac{L}{r}$) and lateral buckling of the compression flange of laterally unsupported beams (which governs flexural stress according to the AISC specification parameter Ld/bt). This is due to the fact that most of the members in building and heavy construction have a sufficiently small Thickness/Width, called $\frac{b}{t}$, ratio so that they will not buckle at stresses below the yield point of the material.[5,8]

For a large majority of members used in tower design, however, the $\frac{b}{t}$ value is sufficiently large to cause local buckling at stresses below the yield point.

When an equal leg thin angle reaches the buckling stress, for example, both of the equal legs buckle in the same direction thus causing a twisting distortion and a sudden, early collapse. Consequently, for a safe design of such angles, it is necessary that the design stress does not exceed the critical buckling stress (f_{cr}) divided by the factor of safety since little or no reserve capacity is available beyond the 'f_{cr}' stress.

The appended curves for allowable compression stresses were employed in the design of the model tower (See Figure 5 F). These curves were constructed on the basis of a modified "Johnson Parabolic Formula" as follows:

$$f_c = \frac{f_y \quad Q}{n\ (1+a)} - \left[\frac{f_y^{\ 2} \quad Q^2}{4n\ (1+a)\pi^2 E} \quad \left(\frac{KL}{r}\right)^2 \right] \qquad \text{---- (5)}$$

where f_c = allowable axial stress ($\frac{P}{A}$ allowable)

f_y = yield stress

Q = a reduction factor dependent on the $\frac{b}{t}$ ratio or member shape

n = factor of safety

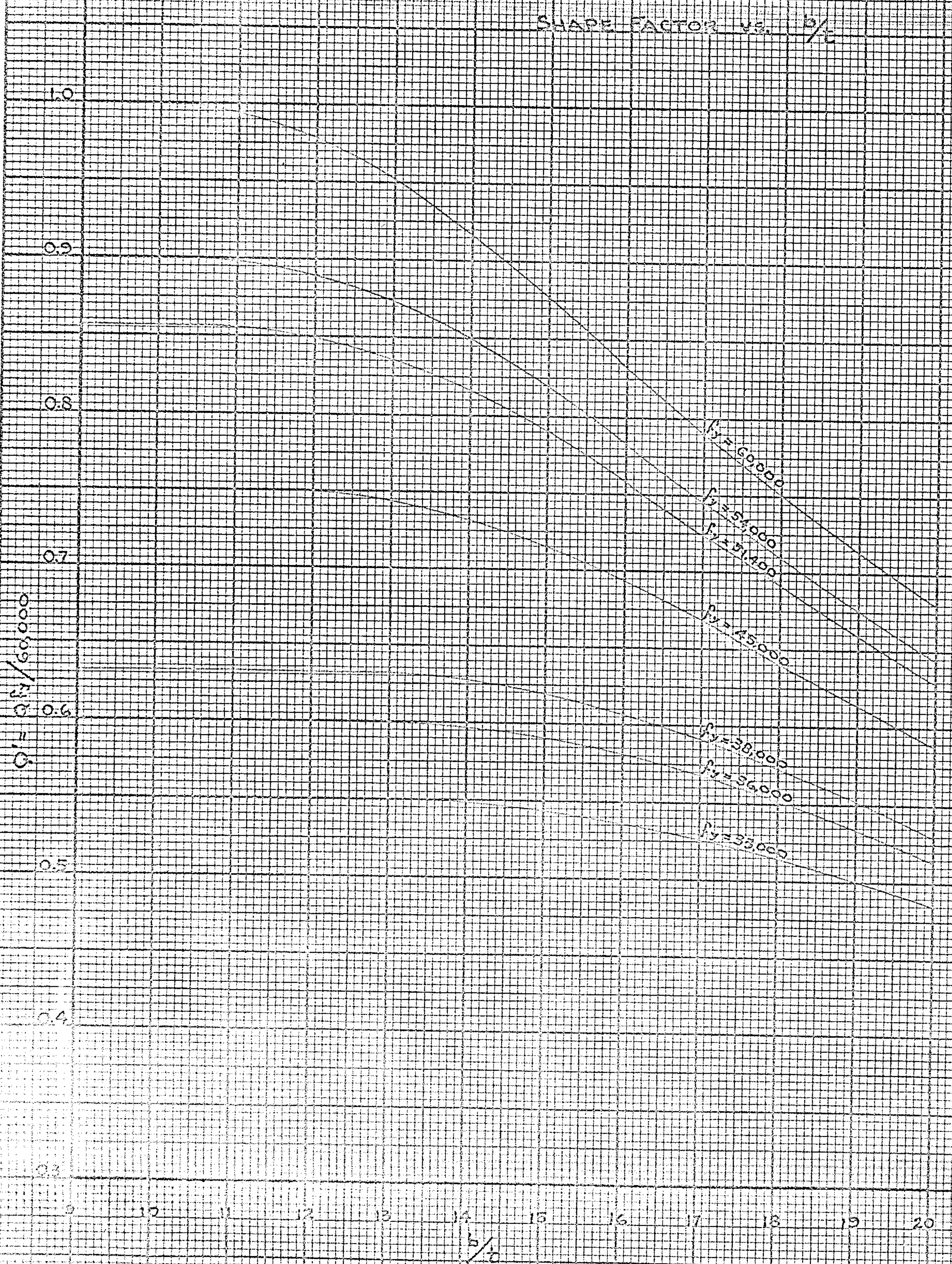
KL = effective column length

a = an allowance for eccentricity

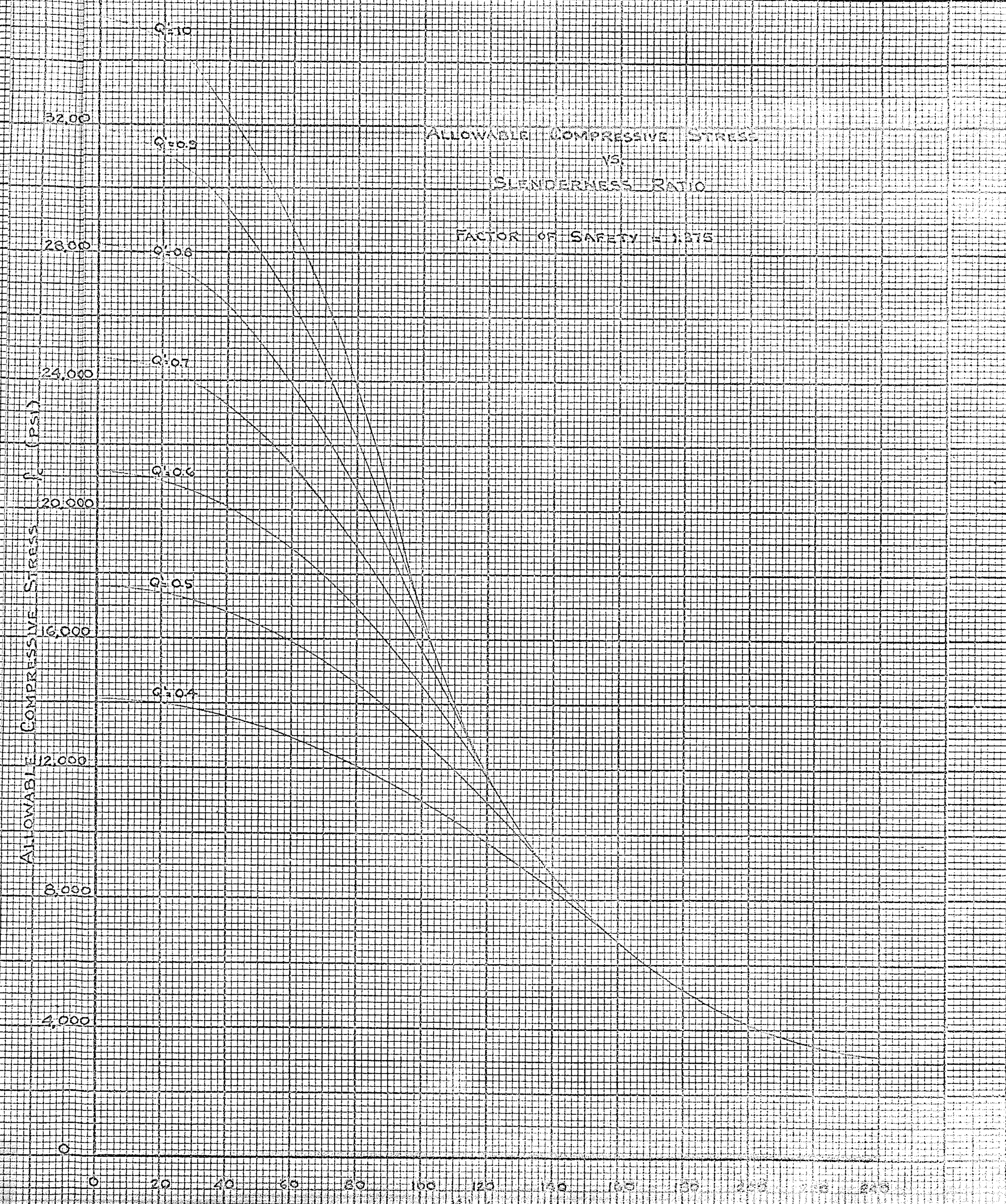
For the design curves in Figure 5 F a factor of safety 'n' of 1.375 was used, 'a' was set equal to 0.25 and $E = 29 \times 10^6$. These values inserted into equation (5) result in the following:

$$f_c = \frac{f_y \quad Q}{1.72} - \left[\frac{f_y\ Q}{44300} \left(\frac{KL}{r} \right) \right]^2 \qquad \text{---- (6)}$$

At this point, it must be emphasized that for large values of $\frac{L}{r}$ the above equation does not apply since the slenderness ratio has a larger effect on the allowable stress than the local buckling con-



CURVE No. 1



CURVE No. 2

HUGHES OWENS 314G 20x20

siderations do.

Hence the lower portion of the curve (i.e. for large $\frac{L}{r}$ values) was constructed using the well known Euler Formula, modified slightly, to be consistent with equation (6) above:

$$f_c = \frac{\pi E}{n\,(1-a)\left(\frac{KL}{r}\right)^2} \qquad \text{---- (7)}$$

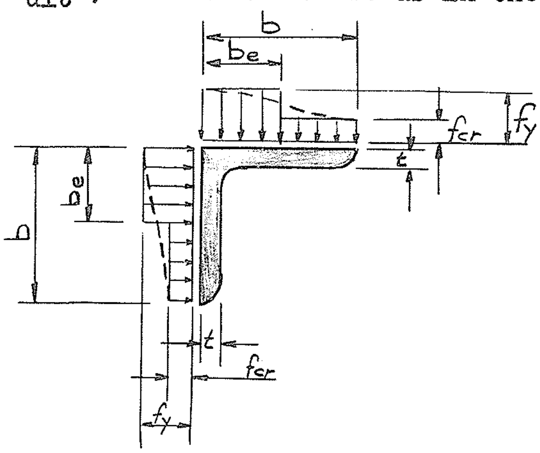
Inserting again values for $n = 1.375$, $a = 0.25$ and $E = 26 \times 10^6$ the modified Euler Formula yields:

$$f_c = \frac{166\ 700\ 000}{\left(\frac{KL}{r}\right)^2} \qquad \text{---- (8)}$$

The point at which the equation (6) leaves off and the Euler Formula governs occurs when the values for f_c in equations (6) and (8) are equal.

Therefore $$\frac{KL}{r}\ \text{limiting} = \frac{23900}{\sqrt{f_y\,Q}} \qquad \text{---- (9)}$$

For angle sections, in particular, the distribution of stress at ultimate load (P_{ult}) is assumed to be as in the following sketch:



where: f_{cr} = critical buckling stress

f_y = yield stress

b_e = effective width

$f_{av.ult.}$ = average ultimate stress

Therefore:

$$P_{ult} = 2\ b_e\ t\ f_y + 2\ (b-b_e)\ t\ f_{cr}$$

$$f_{av.ult.} = \frac{b_e}{b}\ f_y + \left(1 - \frac{b_e}{b}\right) f_{cr}$$

and

$$Q = \frac{f_{av.ult}}{f_y} = \frac{b_e}{b} + \left(1 - \frac{b_e}{b}\right) \frac{f_{cr}}{f_y}$$

$$= \frac{b_e/t}{b/t} + \left[1 - \frac{b_e/t}{b/t}\right] \frac{f_{cr}}{f_y} \qquad \text{---- (10)}$$

Based on available test data (ref. Priest page 41, 1957 ed.), it has been found that $b_e/t = \frac{3820\sqrt{K}}{\sqrt{f_y}}$ where 'K' is a function of the degree of edge support for a given shape. Usually 'K' is accepted being 0.425 for angle sections.

Thus

$$\frac{b_e}{t} = \frac{2490}{\sqrt{f_y}} \qquad \text{---- (11)}$$

and for $0 < \frac{b}{t} \leqslant \frac{2490}{\sqrt{f_y}}$ $\qquad f_{cr} = f_y$

Further tests conducted have indicated the following additional limits:

For

$$\frac{2490}{\sqrt{f_y}} < \frac{b}{t} \leqslant \frac{3735}{\sqrt{f_y}} \qquad f_{cr} = 1.8\ f_y - \frac{f_y^{\frac{3}{2}}}{3110} \left(\frac{b}{t}\right) \qquad \text{---- (12)}$$

and for $\frac{b}{t} > \frac{3735}{\sqrt{f_y}}$ $f_{cr} = \frac{8\ 360\ 000}{(b/t)^2}$ ---- (13)

The allowable compression stress as given by the above formulae is stipulated in the specifications for the "Design and Supply of Transmission Line Towers" for Manitoba Hydro. The equations were originally derived and the curves constructed by A.W. Knight, P. Eng., Design Engineer, Manitoba Hydro.

Load Summaries and Member Selection

The member loads were computed by the method described earlier for the various loading assumptions and the members were selected to comply with these loads as tabulated on Tables V C to V F.

Member	Assumption	1	2	3	4	4a	5	6	7	8	9	10	10a	Torque	Vertical and Dead Load	Total Pounds	Critical Load	Selected Section	Area in²	L in	r in	K	KL/r	b/t	Allowable Stress psi	Existing Stress psi	Number of Bolts	Remarks
1	I	292								340						632	3792	1½x1½x1/8	0.30	22	0.25		88	10	16100	12650	2	
	II	212					3240			340						3792												
	III	292								340						632												
	IV									680						680												
	V	292								340						632												
1a	I	292								340	600					1232	6592	1½x1½x1/8	0.36	17	0.30		57	12	19000	18300	4	
	II	212					5440			340	600					6592												
	III	292								340	600					1232												
	IV									680	1200					1880												
	V	292								340	600					1232												
2a	I	224	735							326	1100				60	2455	9304	1¾x1¾x3/16										
	II	193	735				6880			326	1110				60	9304												
	III	224	670					640	481	326	1110			481	60	3992												
	IV									652	2220				60	2932												
	V	224	670					640		326	1110				60	2970												
2b	I	224	735							326	1110				60	2455	11174	1¾x1¾x3/16	0.62	24	0.34		71	9.3	17800	18050	6	
	II	193	735				8750			326	1110				60	11 174												
	III	224	670					1793	1346	326	1110			1346	60	6875												
	IV									652	2220				60	2932												
	V	224	670					1793		326	1110				60	4183												
3a	I	1700	3480							178	604				150	6112	16060	2½x2½x¼										
	II	1468	3480				10180			178	604				150	16060												
	III	1700	3170					2700		178	604			678	150	9180												
	IV									356	1208				150	1714												
	V	1700	3170					2700		178	604				150	8502												
3b	I	1700	3480							178	604				150	6112	17200	2½x2½x¼										
	II	1468	3480				11320			178	604				150	17200												
	III	1700	3170					3420		178	604			1217	150	10439												
	IV									356	1208				150	1714												
	V	1700	3170					3420		178	604				150	9222												
3c	I	1700	3480							178	604				150	6112	18440	2½x2½x¼	1.19	29	0.49		59	10	18800	15500	10	
	II	1468	3480				12560			178	604				150	18440												
	III	1700	3170					4140		178	604			1760	150	11722												
	IV									356	1208				150	1714												
	V	1700	3170					4140		178	604				150	9942												
4	I	448								120						568	568	1x1x1/8										
	II	388								120						508												
	III	448								120						568												
	IV									240						240												
	V	448								120						568												
5	I	550	1205							43	138					1936	1936	1½x1½x1/8	0.36	47	0.30		157	12	6900	5380	1	
	II	476	1205							43	138					1862												
	III	550	1097							43	138					1828												
	IV									86	276					362												
	V	550	1097							43	138					1828												
6a	I	1575	3480							121	412					5588	6056	1¾x1¾x3/16										
	II	1362	3480							121	412					5375												
	III	1565	3170							121	412			788		6056												
	IV									242	824					1066												
	V	1575	3170							121	412					5278												
6b	I	1575	3480							121	412					5588	6720	1¾x1¾x3/16										
	II	1362	3480							121	412					5375												
	III	1575	3170							121	412			1442		6720												
	IV									242	824					1066												
	V	1575	3170							121	412					5278												
6c	I	1575	3480							121	412					5588	7220	1¾x1¾x3/16	0.62	36	0.34		106	9.3	13800	11640	4	
	II	1362	3480							121	412					5375												
	III	1575	3170							121	412			1942		7220												
	IV									242	824					1066												
	V	1575	3170							121	412					5278												
7	I	1575	3480							121	412					5588	7220	1¾x1¾x1/8	0.42	28	0.35		80	14	17000	17150	4	
	II	1362	3480							121	412					5375												
	III	1575	3170							121	412			1942		7220												
	IV									242	824					1066												
	V	1575	3170							121	412					5278												

Column groups: Loads on Tower Members (Diagrams: + Tension, − Compression; No sign, reversible stress — columns 1 to 10a) and Selection of Members (Critical Load to Remarks).

SUMMARY OF LOADS & SELECTION OF MEMBERS

FIGURE V C

Member	Assumption	Loads on Tower Members — Diagrams (- Tension, - Compression; No sign, reversible stress): 1	2	3	4	4a	5	6	7	8	9	10	10a	Torque	Vertical and Dead load	Total pounds	Selection of Members — Critical Load	Selected Section	Area in^2	L in	r in	K	$K\frac{L}{R}$	b/t	Allowable Stress psi	Existing Stress psi	Number of Bolts	Remarks
8	I II III IV V										1405 1405 1405 2810 1405	5980				1405 1405 7385 2810 1405	7385	2x2x3/16	0.71	44	0.39		113		12 600	10 400	4	
8a	I II III IV V	655 566 655 655	271 271 247 271							13 13 13 26 13	657 657 657 1314	5900	1260			1596 1507 7472 1340 2199	7472	2x2x1/8	0.48	36	0.40		90		15 400	15 600	4	
8b	I II III IV V	779 674 779 779	1063 1063 969 969							82 82 82 164 82	317 317 317 634 317	4640	3620			2241 2136 6787 798 5767	6787	2x2x1/8	0.48	34	0.40		85		16 000	14 100	4	
8c	I II III IV V										337 337 337 674 337	3470	5770			337 337 3807 674 6107	6107	2x2x1/8	0.48	34	0.40		85		16000	12 700	4	
9	I II III IV V										+1518 +1518 +1518 +3036 +1518					+ 1518 + 1518 + 1518 + 3036 + 1518	+3036	1x1x1/8	net 0.16	42	0.20		210		26 200	16 850	2	
9a	I II III IV V										1568 1568 1568 3136 1568					1568 1568 1568 3136 1568	3136	1¼x1¼x1/8										
9b	I II III IV V	1088 942 1088 1088	1530 1530 1395 1395							72 72 72 144 72	596 596 596 1192 595					3286 3140 3151 1336 3151	3286	1¼x1¼x1/8	0.30	24	0.25		96		15 100	10 950	2	
9c	I II III IV V	396 343 396 396	520 520 475 475													916 863 871 871	916	1¼x1¼x1/8										
10	I II III IV V	676 584 676 676	950 950 866 866							52 52 52 104 52	604 604 604 1208 604					2282 2190 2198 1312 2198	2282	1x1x1/8	023	22	0.20		110		13 300	10 000	2	
10a	I II III IV V	322 279 322 322	1084 1084 988 988							69 69 69 138 69	684 684 684 1368 684					2159 2116 2063 1506 2063	2159	1x1x1/8	0.23	26	0.20		130		10 000	9 400	2	
10b	I II III IV V	446 385 446 446	663 663 604 604								397 397 397 794 397					1506 1446 1447 794 1447	1506	7/8x7/8x1/8	0.20	22	0.17		129		10 100	7 500	1	
10c	I II III IV V	496 428 496 496	720 720 657 657								426 426 426 852 426					1642 1574 1579 852 1579	1642	1x1x1/8	0.23	24	0.20		120		11 800	7 150	1	
10d	I II III IV V	512 444 512 512	692 692 631 631								440 440 440 880 440					1644 1576 1583 880 1583	1644	7/8x7/8x1/8	0.20	23	0.17		135		9 300	8 200	1	

SUMMARY OF LOADS & SELECTION OF MEMBERS

FIGURE V D

Member	Assumption	Loads on Tower Members — Diagrams (- Tension, - Compression; No sign, reversible stress) 1	2	3	4	4a	5	6	7	8	9	10	10a	Torque	Vertical and Dead load	Total Pounds	Selection of Members — Critical Load	Selected Section	Area in^2	L in	r in	K	$K\frac{L}{r}$	b/t	Allowable Stress psi	Existing Stress psi	Number of Bolts	Remarks
11	I II III V											820	1480			820 1480	1480	$\frac{7}{8}x\frac{7}{8}x\frac{1}{8}$	0.20	24	0.17		141		8 500	7 400	1	
11a	I II III V											535	1050			535 1050	1050	$\frac{7}{8}x\frac{7}{8}x\frac{1}{8}$		16							1	
11b	I II III V											820	1480			820 1480	1480	$\frac{7}{8}x\frac{7}{8}x\frac{1}{8}$		24							1	
12	I II						3360									3360	3360	$\frac{7}{8}x\frac{7}{8}x\frac{1}{8}$	0.20	11	0.17		65		18 300	16 800	1	
12a	I II III IV V						1260	776 730	584					584		1260 1944 730	1944	$\frac{7}{8}x\frac{7}{8}x\frac{1}{8}$		15							1	
12b	I II III IV V						985	603 603	454					454		985 1511 603	1511	$\frac{7}{8}x\frac{7}{8}x\frac{1}{8}$		17							1	
13	I II III IV V						840	514						387		840 901	901	$\frac{7}{8}x\frac{7}{8}x\frac{1}{8}$		19							1	
13a	I II III IV V						685	420 420						315		685 735 420	735	$\frac{7}{8}x\frac{7}{8}x\frac{1}{8}$		20							1	
13b	I II III IV V						755	483 483						363		755 846 483	846	$\frac{7}{8}x\frac{7}{8}x\frac{1}{8}$	0.20	33	0.17		194		4 400	4 250	1	
14	I II III							410								410	410	$\frac{7}{8}x\frac{7}{8}x\frac{1}{8}$	0.20	24	0.17		141		8 400	2 050	1	
14a	I II III							327								327	327	$\frac{7}{8}x\frac{7}{8}x\frac{1}{8}$		24							1	
14b	I II III							268								268	268	$\frac{7}{8}x\frac{7}{8}x\frac{1}{8}$		26							1	
15	I II III IV V	2680 2323 2680 2680	5930 5930 5400 5400	100 100 100 100			5970	4340 4340							1410 1410 1410 2520 1410	10120 15733 13930 2520 13930	15733	$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$		36								For Calculation see member 15b

SUMMARY OF LOADS & SELECTION OF MEMBERS

FIGURE V E

Member	Assumption	Loads on Tower Members — Diagrams (+ Tension, − Compression, No sign, reversible stress) 1	2	3	4	4a	5	6	7	8	9	10	10a	Torque	Vertical and Dead Load	Total Pounds	Selection of Members — Critical Load	Selected Section	Area in^2	L in	r in	K	$K\frac{L}{r}$	b/t	Allowable Stress psi	Existing Stress psi	Number of Bolts	Remarks
15a	I II III IV V	2570 2224 2570 2570	5930 5930 5400 5400	212 212 212 212	92 92 92 92		5700	4340 4340							1410 1410 1410 2520 1410	10214 15568 14024 2520 14024	15568	2½x2½x3/16										
15b	I II III IV V	2520 2182 2520 2520	5930 5930 5400 5400	286 286 286 286	146 146 146 146	97 97 97 97	5550	4340 4340						2080	1410 1410 1410 2520 1410	10389 15601 16279 2520 14189	16279	2½x2½x3/16	0.90	36	0.49	0.85	62.5		18 600	18 100	10	
18 //	I II III IV V	116 100 116		110 110 110			276							3600		226 486 3826	3826	1½x1½x1/8	0.36	40	0.30		133		9 700	10 600	2	
18 /	III													3600		3600	3600	1½x1½x1/8									2	
18a	I II III				80 80 80											80 80 80	80	7/8x7/8x1/8									1	By inspection
19 //	I II III	83 71 83		81 81 81	66 66 66		192							2660		230 411 2724	2724	1½x1½x1/8	0.36	45	0.30		150		7 600	7 580	2	
19 /	III													2660		2660	2660	1½x1½x1/8										
20 //	I II III	61 52 61		58 58 58	48 48 48		132							1890		167 290 1935	1935	1½x1½x1/8	0.36	45	0.30		150		7 500	5 370	2	
20 /	III													1890		1890	1890	1½x1½x1/8										
20a //	I II III	75 64 75		68 68 68	57 57 57	106 106 106	168							2230		306 463 2375	2375	1½x1½x1/8	0.36	62 xx	0.47		132		9 700	6 600	2	
20a /	III													2230		2230	2230	1½x1½x1/8										
21 //	I II III	-91 -79 -91		+88 +88 +88	+73 +73 +73	+134 +134 +134	+210							+2870		+ 204 + 436 + 3074	+ 3074	1x1x1/8	net 0.17	57	0.20		285		26 200	18 100	2	
21 /	III													+2870		+ 2870	+ 2870	1x1x1/8										

SUMMARY OF LOADS & SELECTION OF MEMBERS

FIGURE V F

CHAPTER VI

Detailing for Fabrication

After the design and dimensioning of the model tower members was completed the detail drawings, required for the fabrication of the structure, were drawn. The system outlines of the structure were used as the basic working lines and, at the same time, as gage lines for the bolt holes which is common practice in structural steel shop drafting. The gage line distances from the center line of hole to the back of the angle were chosen as recommended by the AISC manual for steel construction where practical. (See Appendix 'C' for detail drawings).

For secondary members, as subdiagonals and substruts, the design called for small $\frac{7}{8}$x$\frac{7}{8}$x$\frac{1}{8}$" angles. These angles were substituted by the 1x1x$\frac{1}{8}$" angles because the manufacturer could not supply the smaller angles on short notice. The same problem applied to the chord members of the cross girder where the 2x2x$\frac{3}{16}$" angles were substituted by $2\frac{1}{2}$x $2\frac{1}{2}$x$\frac{3}{16}$" angles.

As mentioned earlier it was desirable to employ only one size of bolts to simplify the fabrication, and the 3/8" Ø tower bolt (ASTM 394) was selected. The data for this size of tower bolt is listed in Table VI A. This table also shows the minimum distances from the center of bolt hole to the ends of members and from center of bolt hole to the rolled edge of the angle. It was initially intended to make the size of holes 13/32" Ø but, on the manufacturers request, a 1/16" bolt clearance was permitted and the bolt holes were made 7/16" Ø.

The fact that some pairs of diagonals on the lower portion of the tower were not detailed as "left and right" members did not influence the performance of the tower under load.

TABLE VI A

DATA ON 3/8" ø TOWER BOLTS (ASTM 394)

Allowable unit stress, single shear	18 000 psi
Allowable bearing on bolts	48 000 psi
Gross area of shank	0.110 in^2
Capacity of bolt in single shear	1.98 k
Capacity of bolt in bearing:	
1/8" material thickness	2.25 k
3/16" material thickness	3.28 k
$\frac{1}{4}$ " material thickness	4.48 k
Bolt hole distances:	
Minimum edge distance (rolled edge)	7/16 in.
Minimum end distance (cut end)	5/8 in.
Minimum distance center to center of bolt hole	7/8 in.
Diameter of bolt holes	13/32 in.

CHAPTER VII

ELECTRICAL RESISTANCE STRAIN GAGES

Type of Strain Gages

The bonded wire resistance strain gage is an electrical device, developed simultaneously by Dr. A.C. Ruge working at the Massachusetts Institute of Technology and E.E. Simmons working at the California Institute of Technology in 1938, and it is used to measure the magnitude of strain due to stress. The gage, named the SR-4 gage, is manufactured in the United States by the Baldwin-Lima-Hamilton Corporation.[2]

In using strain gages, two physical quantities must be considered; the change in gage resistance and the strain. The dimensionless relationship between these two variables is called the gage factor of the strain gage and is expressed mathematically as:

$$F = \frac{\triangle R/R}{\triangle L/L}$$

where L = initial length of strain gage wire

$\triangle L$ = change in length as gage is strained

R = initial resistance of strain gage wire

$\triangle R$ = change in resistance as gage is strained

The gage factor thus is a measure of the amount of the resistance change for a given strain and thus is an index of the strain sensitivity of the gage.

The wire resistance must have the following characteristics; a constant ratio between resistance change and strain, a high resistance and a large change in resistance with strain, a high elastic limit, be relatively insensitive to temperature in both its physical and electrical properties and have a very small diameter so that the cement in which it is enclosed will be considerably stronger than the wire.

SR - 4 type wire and foil gages are suitable for an extremely large variety of applications. Resulting from the many specialized and extreme conditions more than 275 different standard types have been developed and are available from the aforementioned manufacturer.

After due consideration of the conditions and the manufacturers literature (Baldwin-Lima-Hamilton[6] Strain Gage Handbook Bulletin 4311 A) the SR - 4 Type A-7 electrical strain gage was selected as the one most suited for this project.

Basically this gage consists of a wire filament wound around a cylindrical paper core in the form of a close-wound helix which is then flattened and cemented between layers of paper for purposes of protection and insulation (sandwich construction).

The gages used were produced in one lot and all had the following properties:

Resistance:	119.5	±	.3 Ohms
Gage Factor:	1.98	±	2%
Lot No.:	B -31	;	Type: A - 7

Application of Strain Gages

The preparation of tower members for the attachment of the strain gages was done without difficulties since the galvanized steel angles offered a smooth and clean surface. It was therefore sufficient to clean the surfaces with a 3" Ø rotating steel brush and to wipe them meticulously clean with a cotton swab soaked with acetone. Based on experience from the preliminary tests, the location of gages was marked uniformly and very accurately at 3/16" distance from the heel and the toes of all angles except the $2\frac{1}{2}$" wide angles where the distance was chosen to be $\frac{1}{4}$".

It became obvious during the preparation of the angle sections for the preliminary tests that for a greater number of strain gages (i.e. 198 for the 30 ft. high tower) the method of application, as recommended by the gage manufacturer, had to be altered. Ways had to be found to avoid excessive consumption of time and material required to apply felt covers over the gages and clamping during the setting period of the bonding cement. These felt covers and clamps would also hinder inspection during the drying period of the cement.

It was observed that the edges of the paper backing of the SR - 4 (A7) strain gages tend to curl up under the moistening action of the cement. At the same time, it is believed that cement is sucked in and away from the edges thus creating the undesirable condition for forming air bubbles between steel and paper backing of the gage.

Therefore it was decided to apply a more generous amount of cement to the underside of the strain gage. The strain gage was then placed on the member and the cement worked outwards from the center resulting in a small convexity of cement along the perimeter of the gage. A bluntly pointed pencil size instrument was found to be very satisfactory for performing this task.

The process of working out the cement and depressing the gage to the steel surface required about 40 - 60 seconds after which period the cement was sufficiently set to hold the gage to the steel. Any slight edge curling could now occur without impairing the bond of the gage since only cement, not air, could be sucked in from the protective protrusion of cement at the edges.

Without further treatment the strain gages were ready for use after 24 hours drying time and from the total number of strain gages attached only two did not work properly and had to be replaced. It was found to be most important, when working with "Duco" cement that the cement be fresh and free of any bubbles.

The application of strain gages was done indoors at the prevalent room temperature of 75°F and at low relative humidity. Prior to moisture proofing the gages two tests were conducted to ascertain whether the gages would function properly.

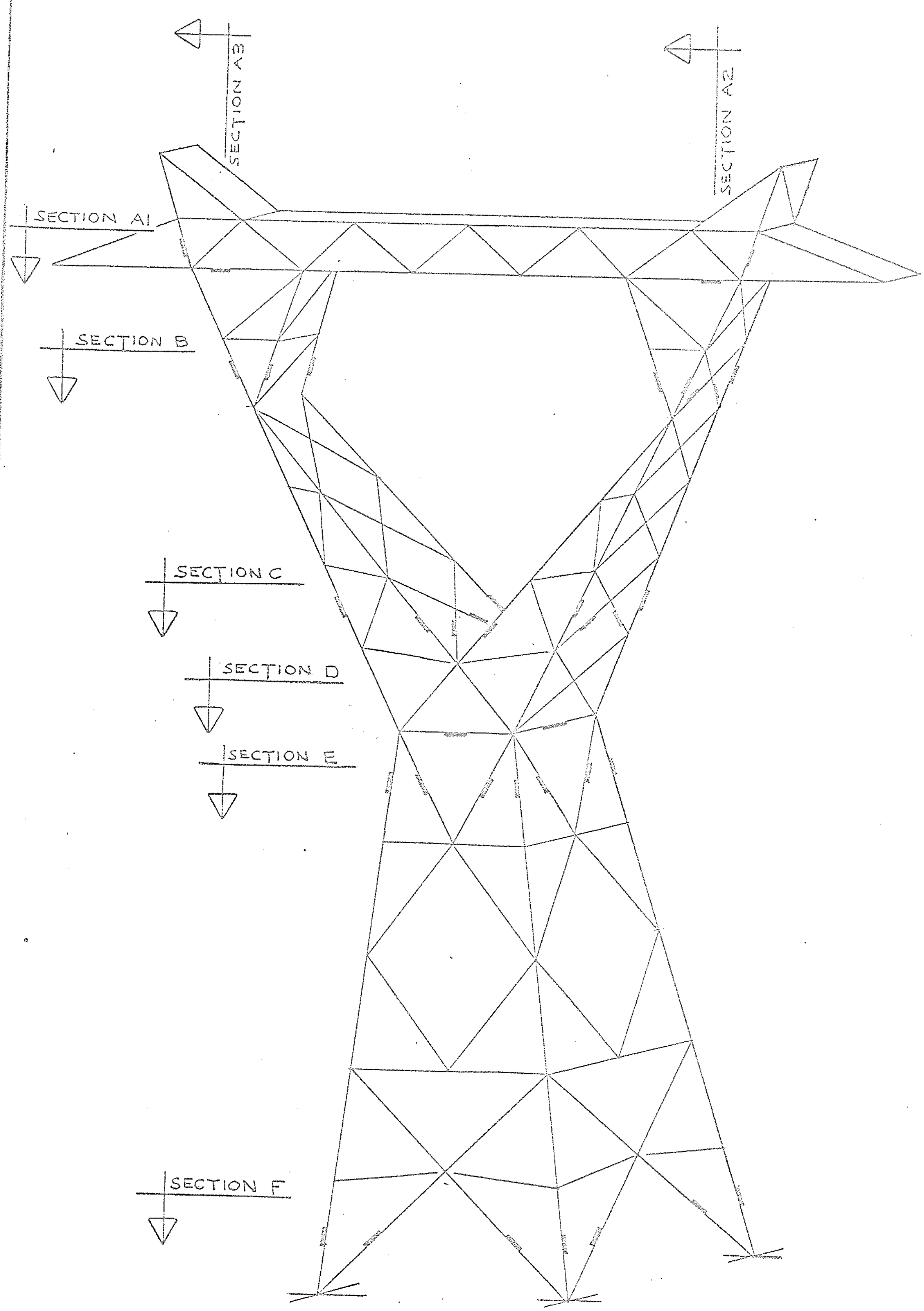
First the gage resistance was checked and secondly the bonding of the gage to the member was tested. The latter was performed by connecting the gage in a Wheatstone Bridge circuit, balancing the bridge, bringing the dial to the zero point and then pressing lightly the strain gage with the eraser end of a lead pencil. If the dial did not return to zero after deflecting an imperfection such as an air bubble in the bonding cement was suspected.

Location of Strain Gages

For reasons of practicability, the locations of strain gages were chosen, as shown in Figure 7 A, at 6 different levels of the model tower structure. Each horizontal section carries the letter corresponding to the respective gage group.

The application of strain gages on all faces at the horizontal sections was considered to be the minimum requirement to determine the stress distribution in the model tower structure.

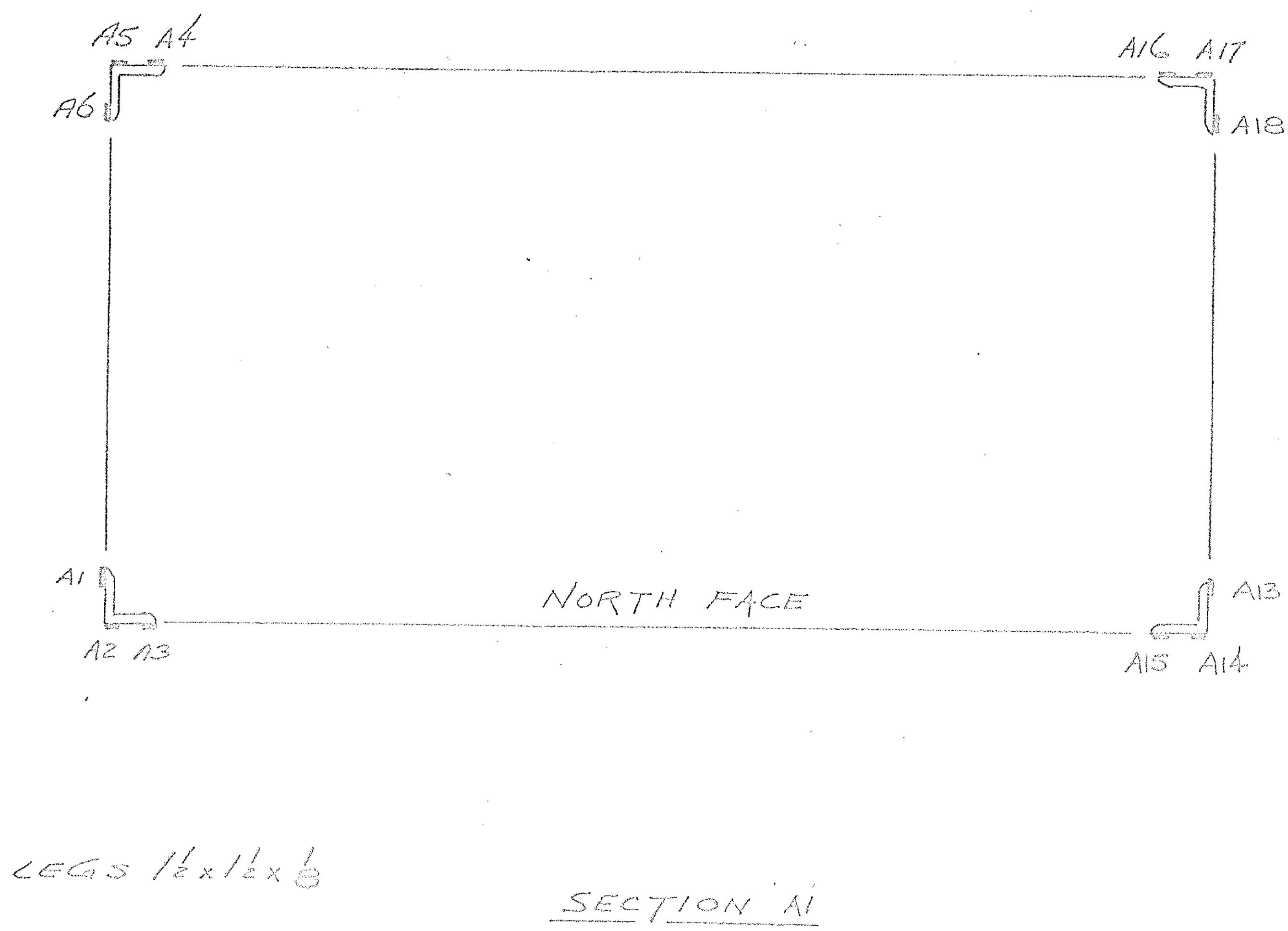
The detailed location of the strain gages at the various levels is shown on Figures 7 B to 7 H with gage to heel and toes of angle



LOCATIONS OF STRAIN GAGES

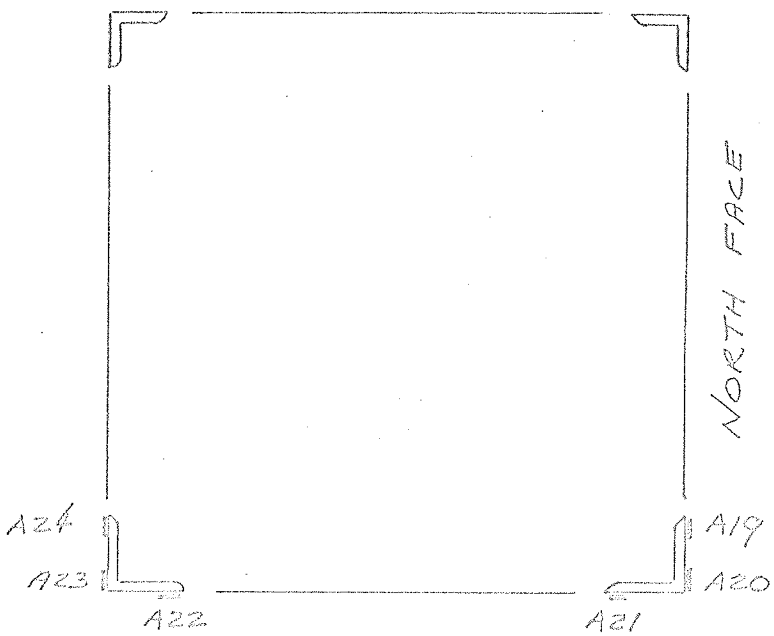
FIGURE 7 A

SHEET 1 OF 5



DETAIL LOCATION OF STRAIN GAGES, GROUND WIRE PEAK

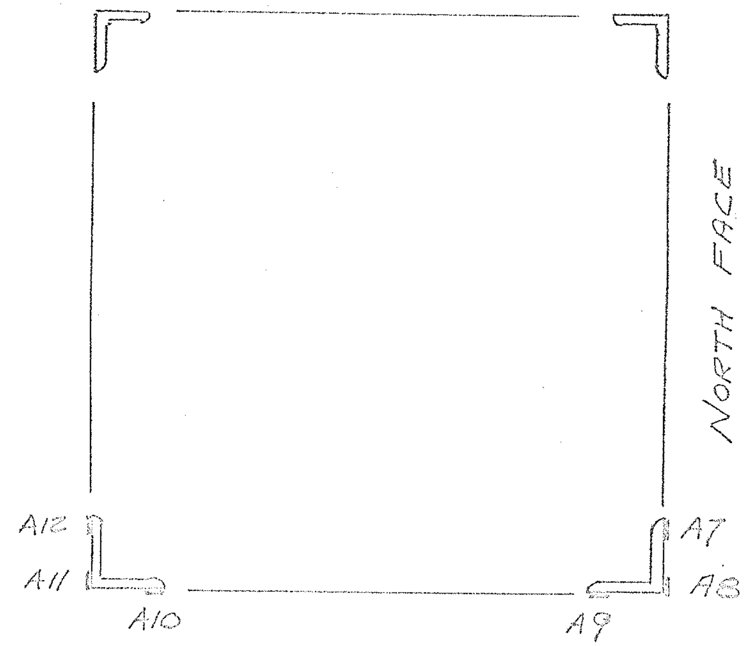
FIGURE 7 B



WEST END

CHORDS $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$ L

SECTION A2



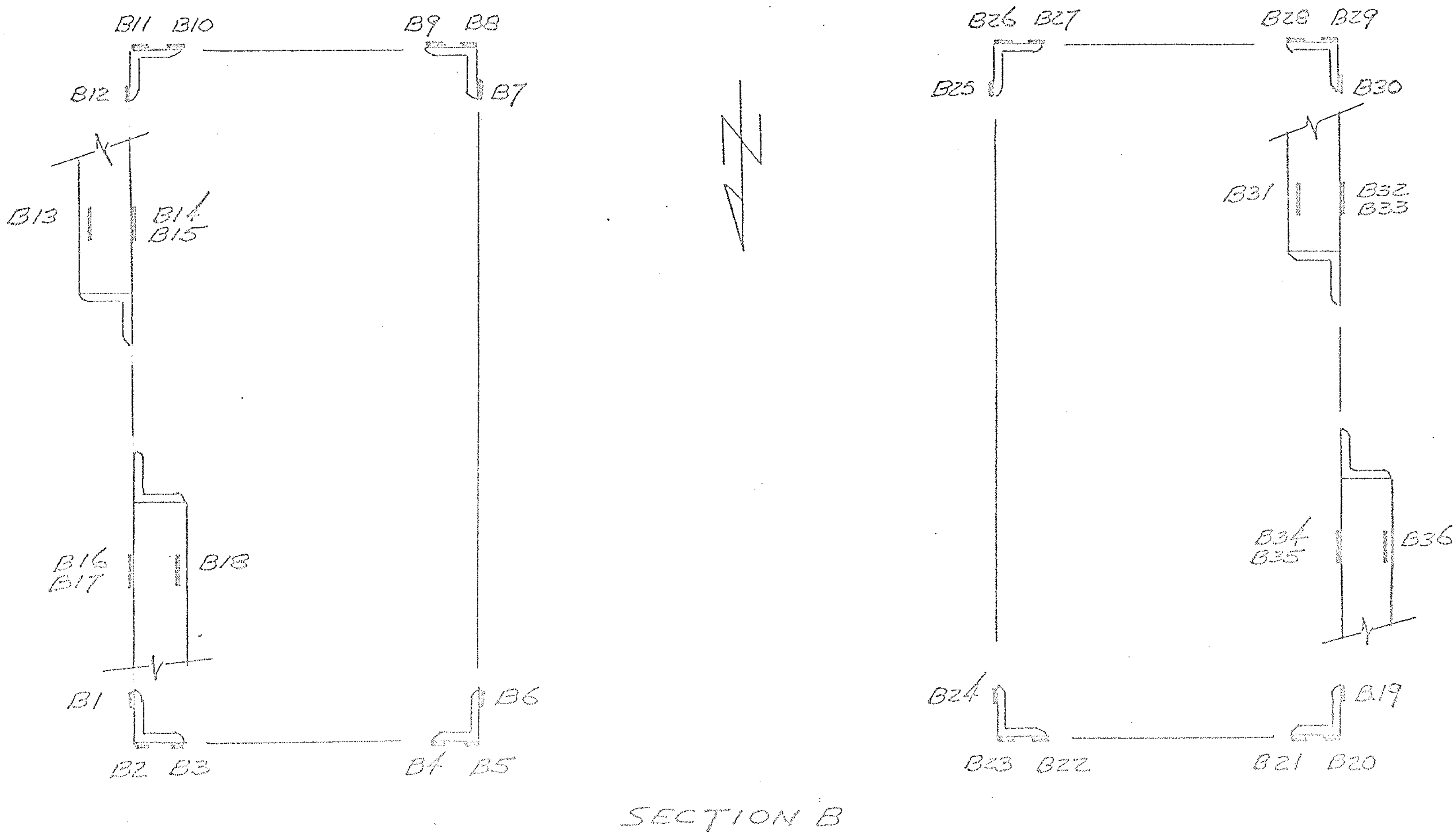
EAST END

CHORDS $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$ L

SECTION A3

DETAIL LOCATION OF STRAIN GAGES, BOTTOM CHORD OF GIRDER. FIGURE 7 C

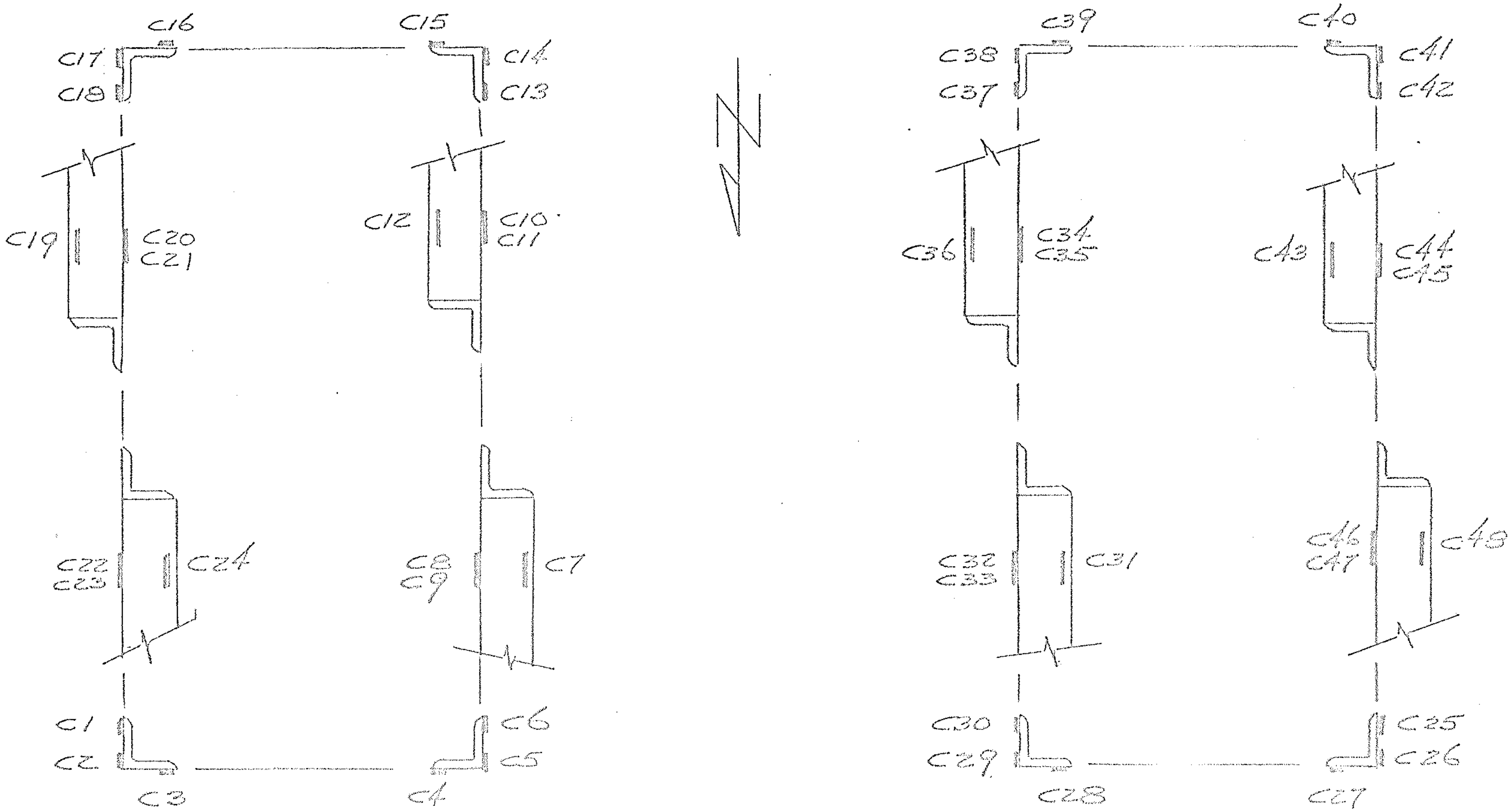
SHEET 3 OF 8



OUTSIDE LEGS $1\frac{3}{4} \times 1\frac{3}{4} \times \frac{3}{16}$
INSIDE LEGS $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$
DIAGONALS $1 \times 1 \times \frac{1}{8}$

DETAIL LOCATION OF STRAIN GAGES, ABOVE SUPPORT POINT

FIGURE 7 D

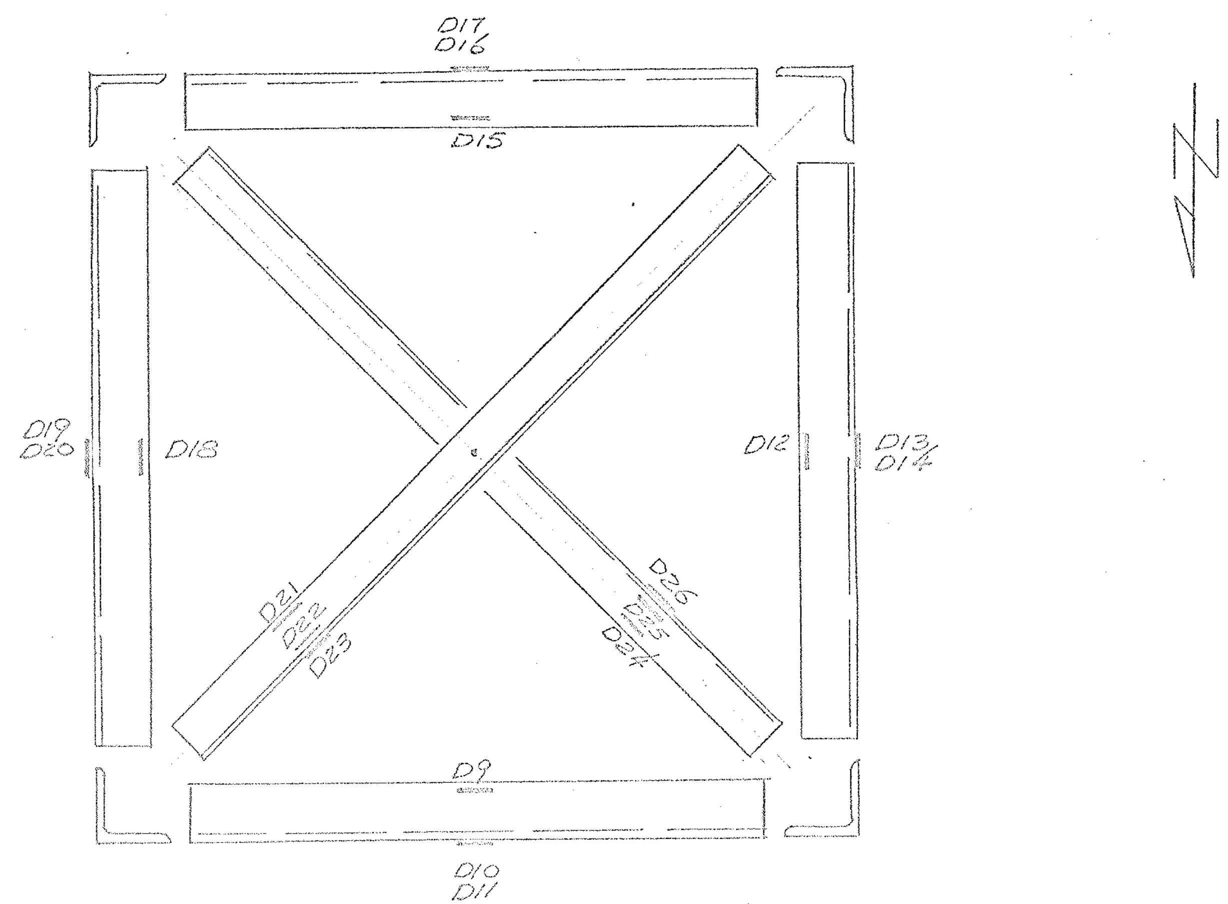


SECTION 'C'

OUTSIDE LEGS $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$
INSIDE LEGS $1\frac{3}{4} \times 1\frac{3}{4} \times \frac{3}{16}$
DIAGONALS $1 \times 1 \times \frac{1}{8}$

DETAIL LOCATION OF STRAIN GAGES, LOWER SUPPORT ARM

FIGURE 7 E

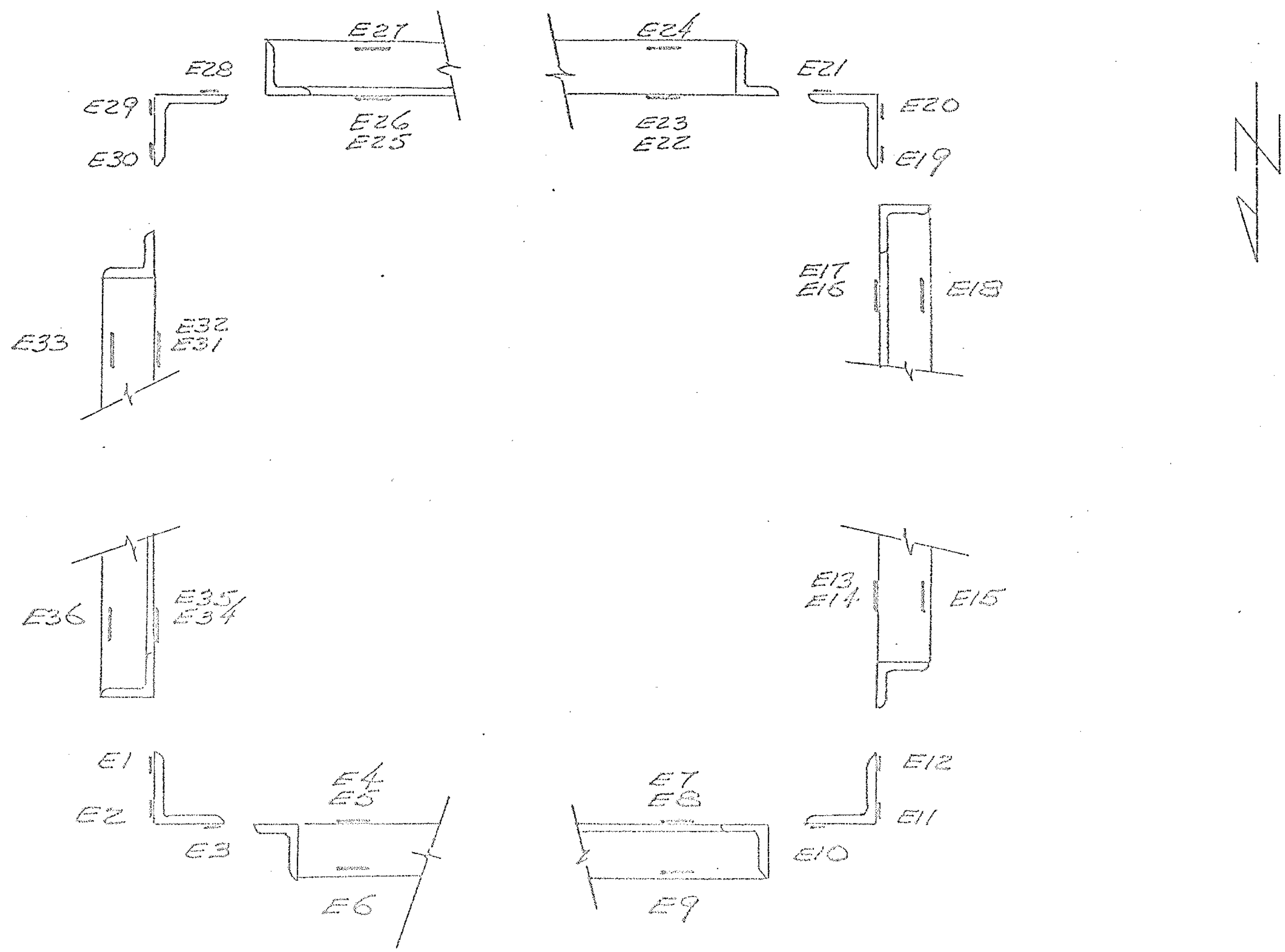


STRUTS $2 \times 2 \times \frac{1}{8}$
DIAGONALS $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$

SECTION D

DETAIL LOCATION OF STRAIN GAGES, AT WAIST

FIGURE 7 F

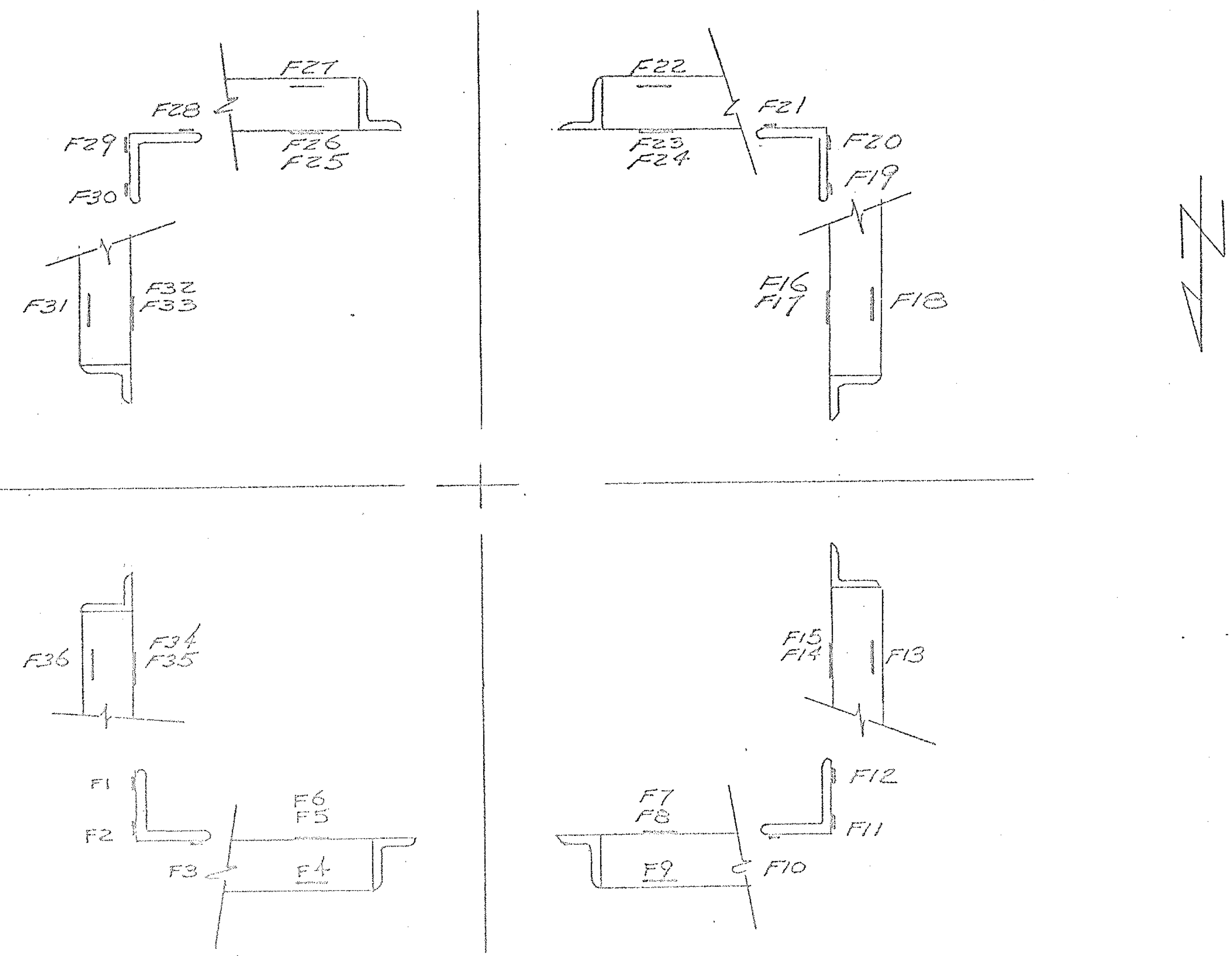


LEGS $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$
DIAGONALS $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$

SECTION E

DETAIL LOCATION OF STRAIN GAGES, BELOW WAIST

FIGURE 7 G



SECTION F

LEGS $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$
DIAGS $1 \times 1 \times \frac{1}{8}$

DETAIL LOCATION OF STRAIN GAGES, ABOVE TOWER BASE
FIGURE 7 H

SHEET 8 OF 8

distances as mentioned earlier.

Wiring

Mechanical devices as shown on Plate VII A were fabricated from plastic material and affixed to the angle members by liquid aluminum so that external forces from the lead wires were not transmitted to the strain gage filaments. To minimize the lengths of lead wire supported by the strain gage terminals, the plastic pieces were located at 2" distance from the center line of gage.

For the wiring, a #24 A.W.G. = 0.0201 " ∅ copper wire with polyethylene insulation was used. The copper cross section of the wire was 404 C.M. and the electrical resistance 25.7 Ohm per 1000 feet. The multitude of wires was bundled with plastic spiral wrap and the bundles were tightly secured to the steel members as shown on Plate VII A.

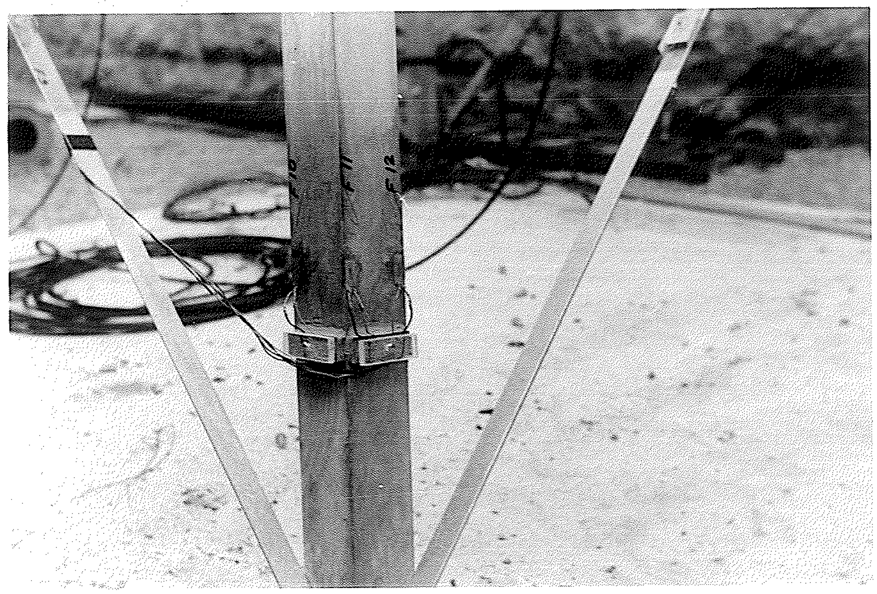
The bundles of wires contain:

24 double wires for the gage group	A 1	-	A 24
36 double wires for the gage group	B 1	-	B 36
40 double wires for the gage group	C 1	-	C 40
26 double wires for the gage group	C 41	-	C 48
	D 9	-	D 26
36 double wires for the gage group	E 1	-	E 36
36 double wires for the gage group	F 1	-	F 36

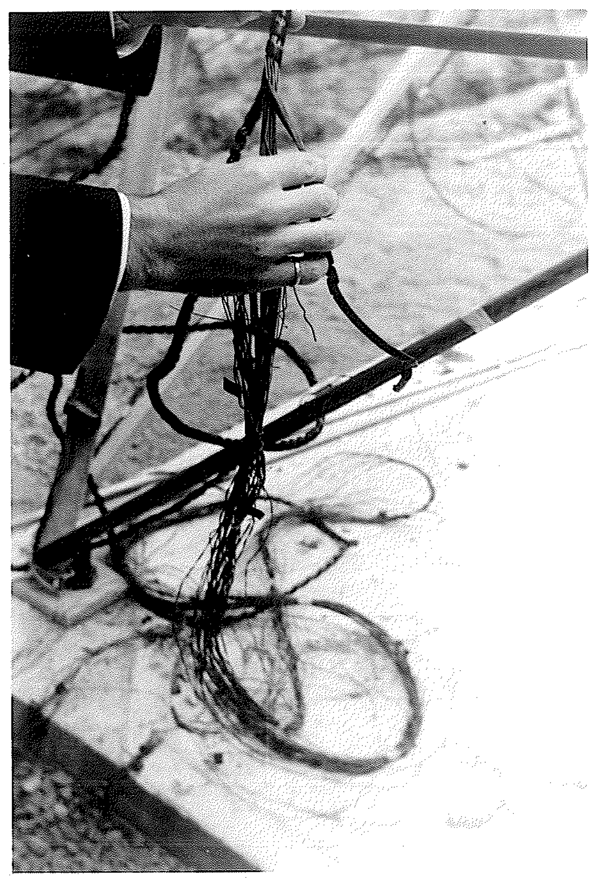
A plastic marker was attached to every pair of wires and stamped with number and group for easy identification.

Moisture Proofing

Since it was necessary that the structure be exposed to the weather some measure of protection for the strain gages and the uninsulated lead



SR-4 (A 7) STRAIN GAGES AND
LEAD WIRE CLAMPS MOUNTED ON TOWER MEMBERS



BUNDLING LEAD WIRES WITH SPIRAL WRAP

PLATE VII A

wire ends against moisture was required.

Several moisture-proofing agents were applied to the strain gages on the preliminary test pieces, subjected to temperatures of $-30^{\circ}F$ for a period of 48 hours, subsequently submerged in water for a period of 24 hours and air dried for 6 hours followed by a gage response test and a steel to gage insulation test with a highly sensitive ohmmeter. The moisture-proofing agents were:

(a) Two-Component Epoxylite #222 manufactured by Epoxylite Corporation

(b) Wax moisture-proofing supplied by R.O.R. Associates, Toronto

(c) GW-1 moisture-proofing compound manufactured by Budd Instrument Div.

The GW-1 moisture-proofing compound was finally chosen for the tower test project because of the simplicity of its application in any position and because of the possibility of protecting the uninsulated terminals of the strain gage and the soldered connections of the lead wires as well in one operation.

CHAPTER VIII

PREPARATION OF TEST FACILITIES

General

The location of the test site is shown on Figure 8 A. It was limited in its extent by the proximity of the transformer bank to the east, the wall of the Civil Laboratories to the south, the staff parking area to the west and the driveway which services the main delivery entrance for the Engineering building to the north.

Two desirable features of the test site were that it was protected on three sides by the Engineering building and that the test procedures did not interfere with University activities. Office space required for housing the Digital Strain Indicator and other office equipment was provided in the Engineering laboratories. The office location was most satisfactory due to its proximity to the test site permitting the lead wires to be kept to a minimum length. Also removable windows aided communication between the office and the test site.

Model Tower Foundation

The foundation for the model tower was designed on the basis of assumed soil strength characteristics and maximum test loads and, for the purpose of future testing, a drawing of the foundation is included (see Figure 8 B). Unfortunately, during construction, the south piles had to be terminated at 12'-6" below grade because of a concrete obstruction at that level.

Longitudinal Loading Arrangement

The longitudinal loading arrangement is shown in Figure 8 C. Permission was given by the University of Manitoba to install an

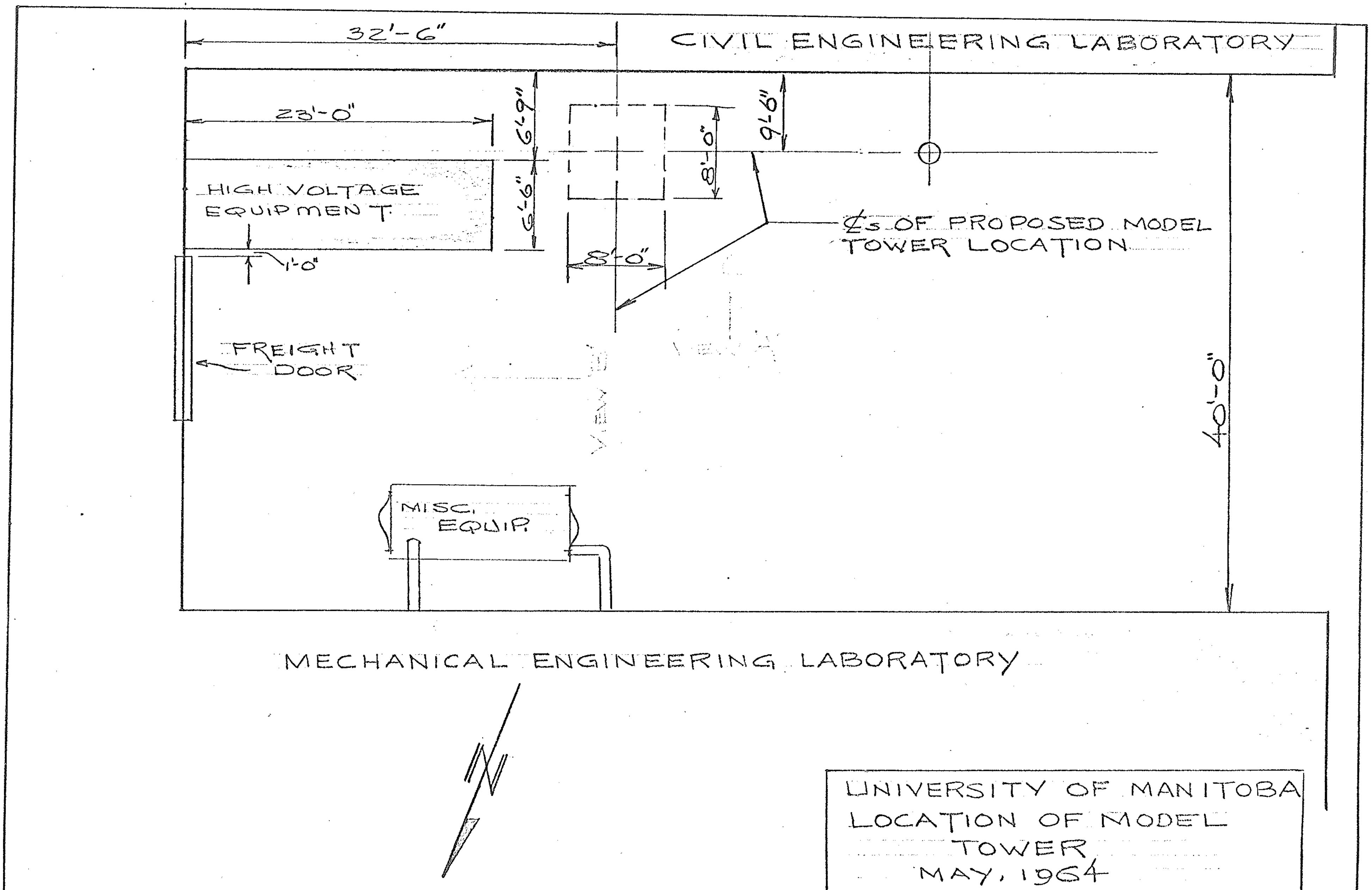
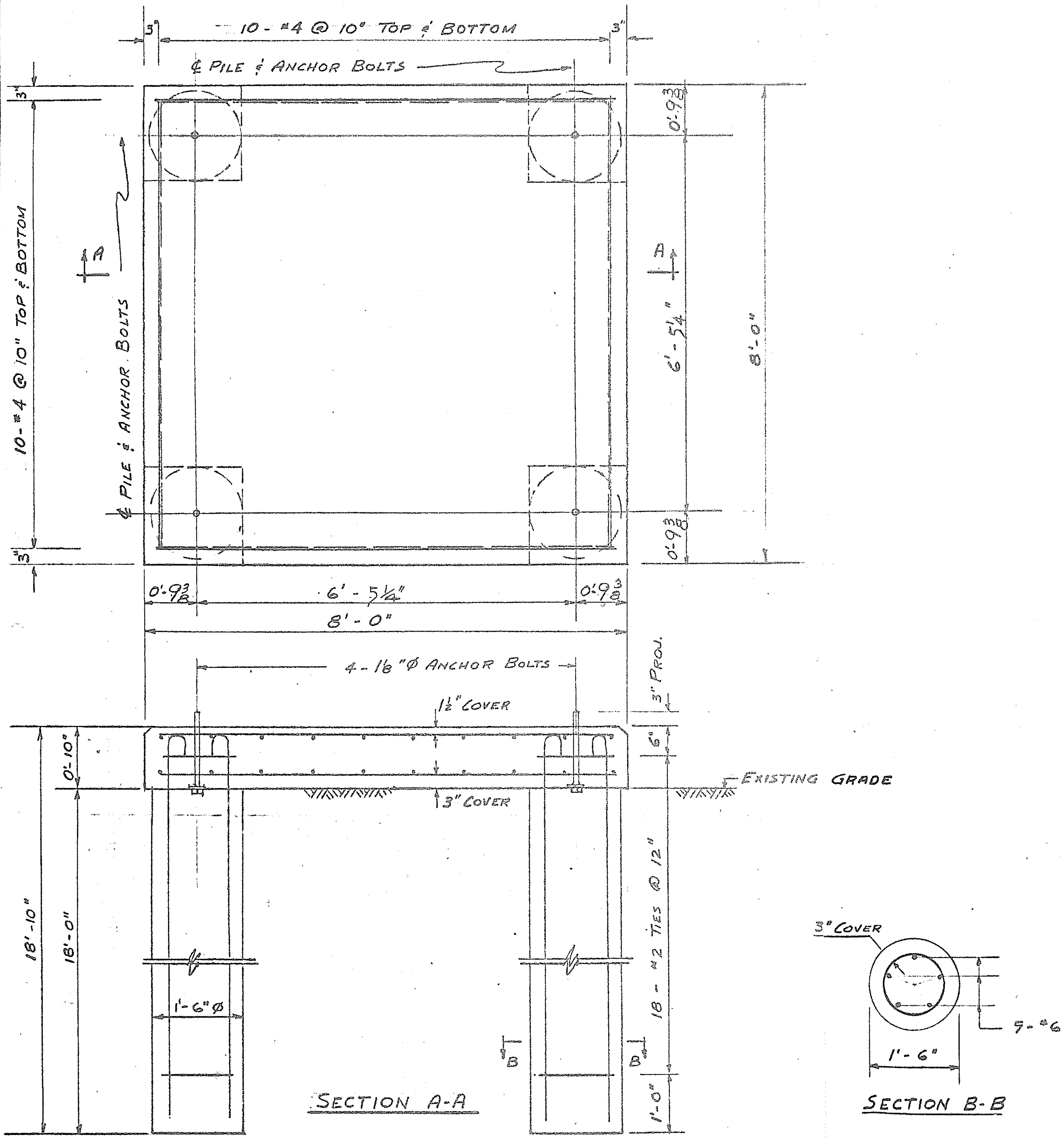

32'-6"
CIVIL ENGINEERING LABORATORY
23'-0"
6'-9"
9'-6"
8'-0"
HIGH VOLTAGE
EQUIPMENT
6'-6"
1'-0"
8'-0"
℄s OF PROPOSED MODEL
TOWER LOCATION
FREIGHT
DOOR
40'-0"
MISC.
EQUIP.
MECHANICAL ENGINEERING LABORATORY
N
UNIVERSITY OF MANITOBA
LOCATION OF MODEL
TOWER
MAY, 1964

FIGURE 8 A



NOTES:

1 - Minimum strength of concrete shall be 3000 psi at 28 days

2 - All concrete and reinforcing steel shall conform to CSA. specifications A-23 latest revision.

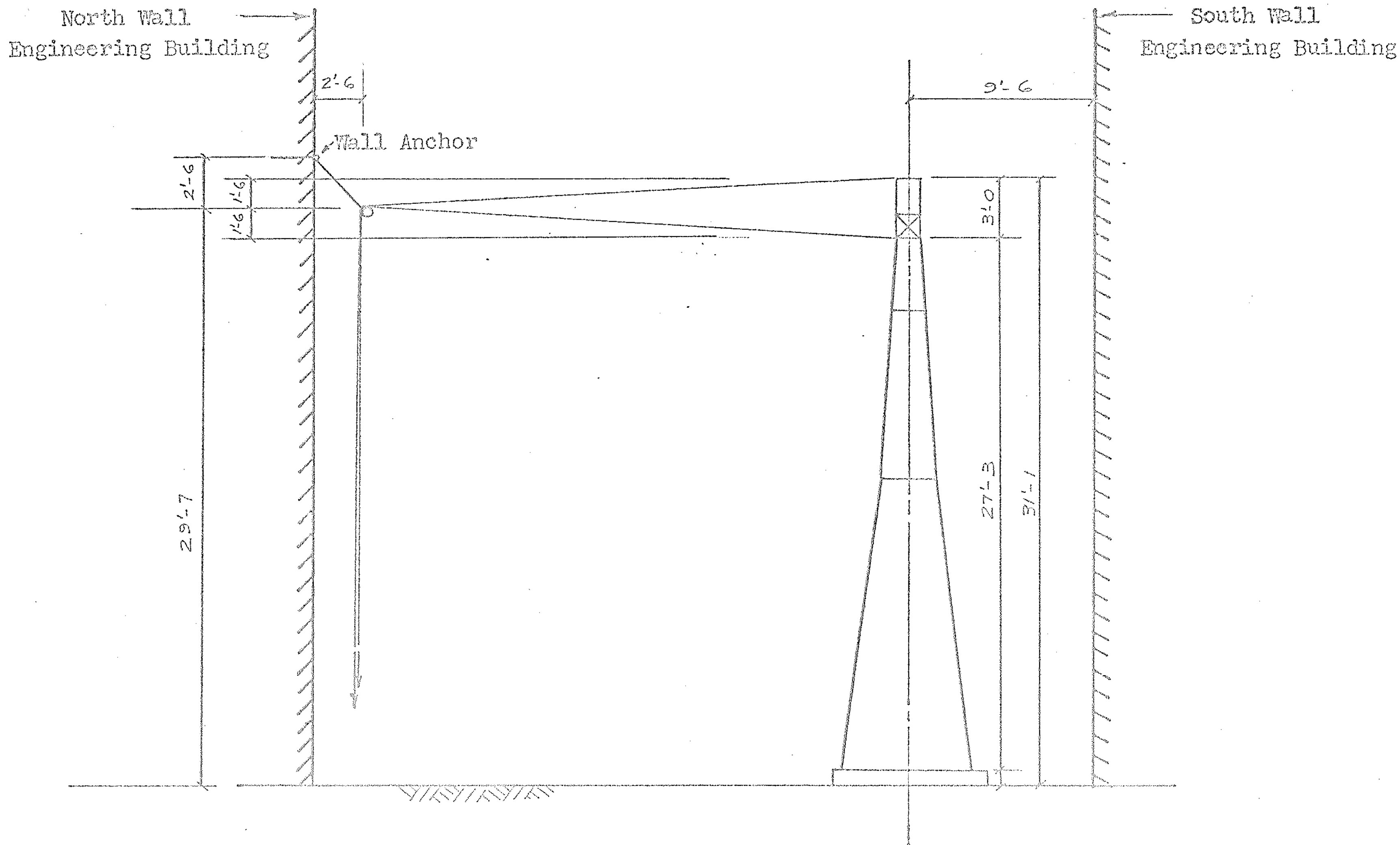
UNIVERSITY OF MANITOBA

MODEL TOWER FOUNDATION

Concrete and Reinforcing Details

Scale ½" = 1'-0 May 64

FIGURE 8 B



LONGITUDINAL LOADING ARRANGEMENT

FIGURE 8 C

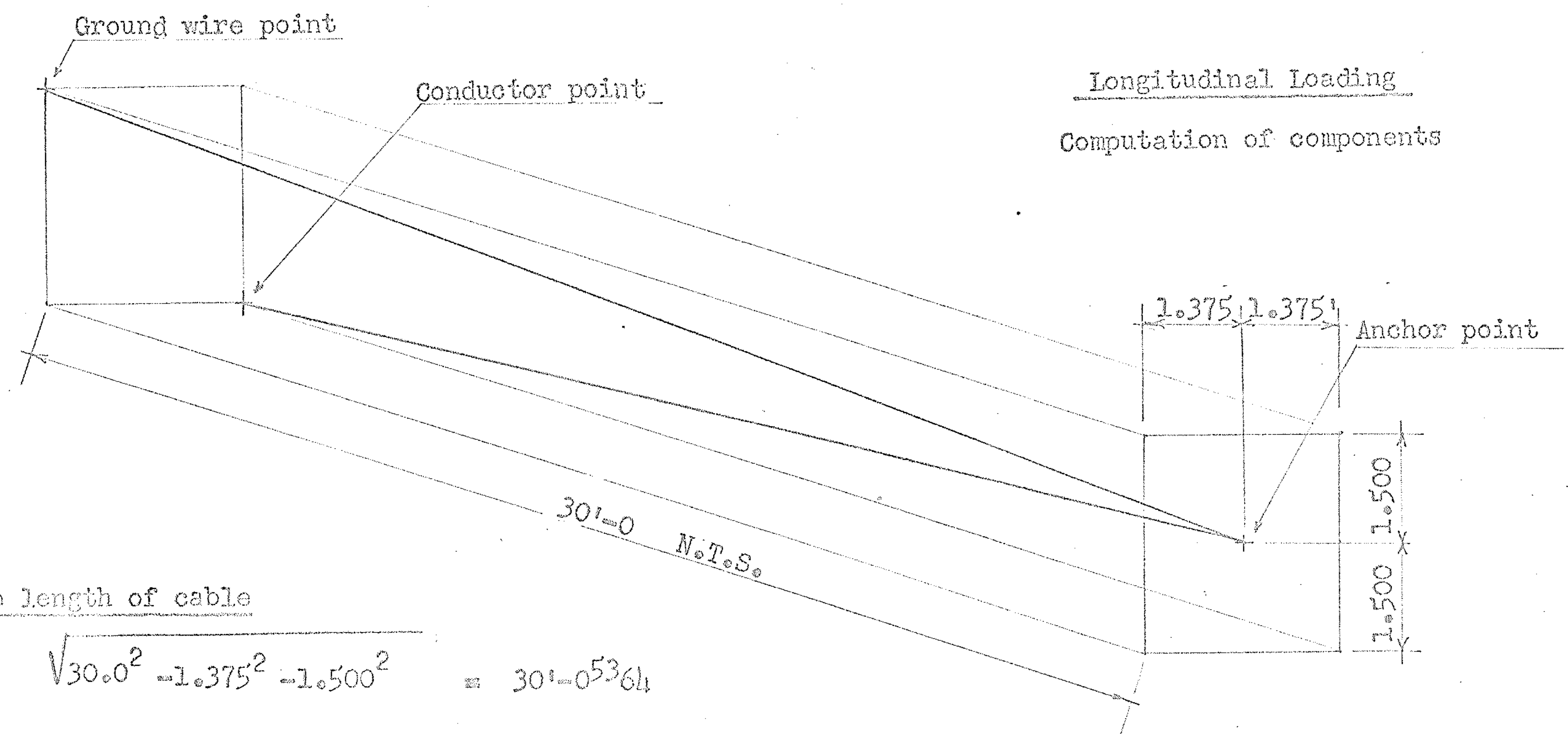
anchor consisting of a $1\frac{1}{4}$" diameter eye bolt complete with bearing plates and double nuts in the south wall of the Mechanical Engineering building approximately 30 ft. above ground level.

To complete the anchor assembly, two 9" diameter sheaves with sleeve bearings were attached to the anchor. The wall anchor was located such that the sheaves under load would swing into position at 28'-9" above the top of the tower foundation and 9'-$7\frac{1}{2}$" west of the centerline of the tower. This location minimizes the magnitude of undesired load components. (See Figure 8 D and Plate VIII A).

To make up the loads required and to aid in load application, the following equipment was available:

75 pieces of standard laboratory cast steel test weights each	50#
5 pieces of standard laboratory cast steel test weights each	20#
10 pieces of standard laboratory cast steel test weights each	10#
1 obsolete machine base, used as loading platform	480#
1 existing cage from steel angle sections	105#
1 existing cage of lighter construction	45#
1 existing cage made from 3/4" diameter pipes	30#
3 planks 2" thick for placing weights for vertical loading	45#
6 round concrete weights with an average of each	180#
1 hydraulic jack, 20-ton capacity	
1 block and tackle, $1\frac{1}{2}$ ton capacity	
1 gear type tackle, 3/4-ton capacity	

Plate VIII A shows the arrangement of cables, blocks, loading cages and weights during testing.



True length of cable

$$\sqrt{30.0^2 - 1.375^2 - 1.500^2} = 30'\text{-}0^{53}64$$

Transverse at G.W. point

Log 1.375	= 0.13 830
Log 2455	= 3.39 005
	3.52 835
Log 30-0⁵³64	= 1.47 812
	2.05 023

= 112.3#

Vertical at G.W. point

Log 1.500	= 0.17 609
Log 2455	= 3.39 005
	3.56 614
Log 30-0⁵³64	= 1.47 812
	2.08 802

= 122.5#

Transverse at Cond. point

Log 1.375	= 0.13 830
Log 2255	= 3.35 315
	3.49 145
Log 30-0⁵³64	= 1.47 812
	2.01 333

= 103.1#

Vertical at Cond. point

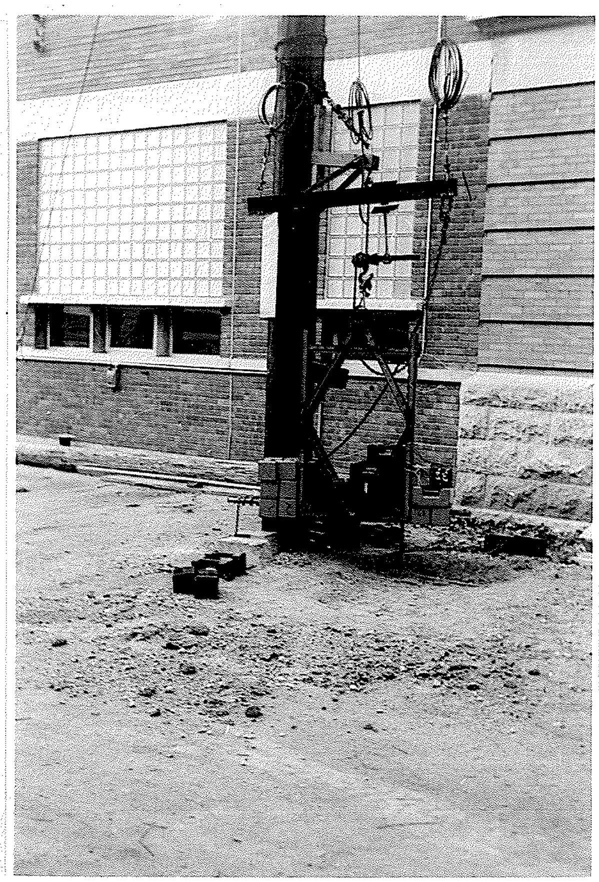
Log 1.500	= 0.17 609
Log 2255	= 3.35 315
	3.52 924
Log 30-0⁵³64	= 1.47 812
	2.05 112

= 112.5#

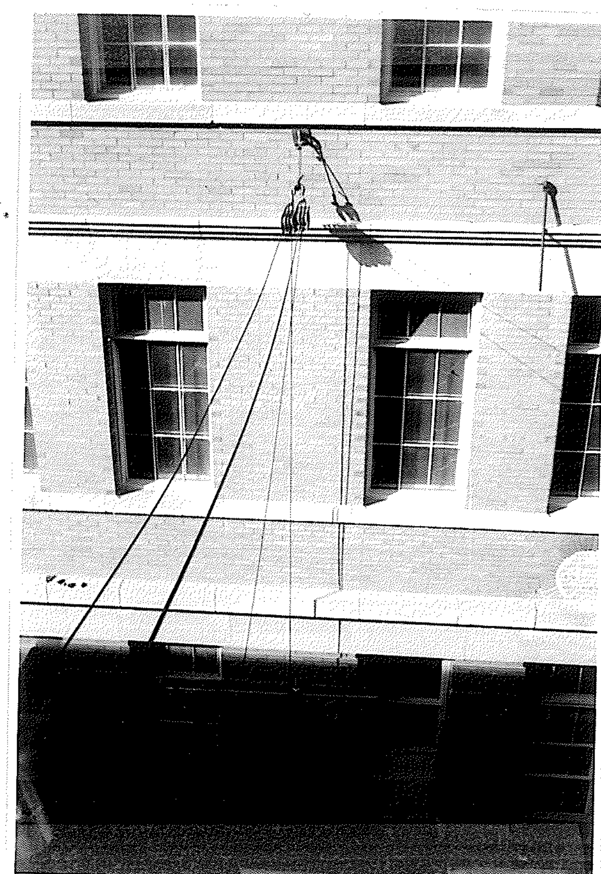
SHEAVE LOCATION IN LONGITUDINAL LOADING ARRANGEMENT

FIGURE 8 D

TRANSVERSE LOADING SYSTEM



LOADING CABLE AND EVENER BEAM



WALL ANCHOR AND SHEAVES FOR LONGITUDINAL LOADING SYSTEM

PLATE VIII A

Transverse Loading Arrangement

The transverse loading arrangement is shown in Figure 8 E. For transverse load application a 40 ft. pole, Class II, was erected to the west of and on the east-west centerline of the tower. The pole was set in an augered hole of 6 ft. depth and the backfill was well tamped during erection.

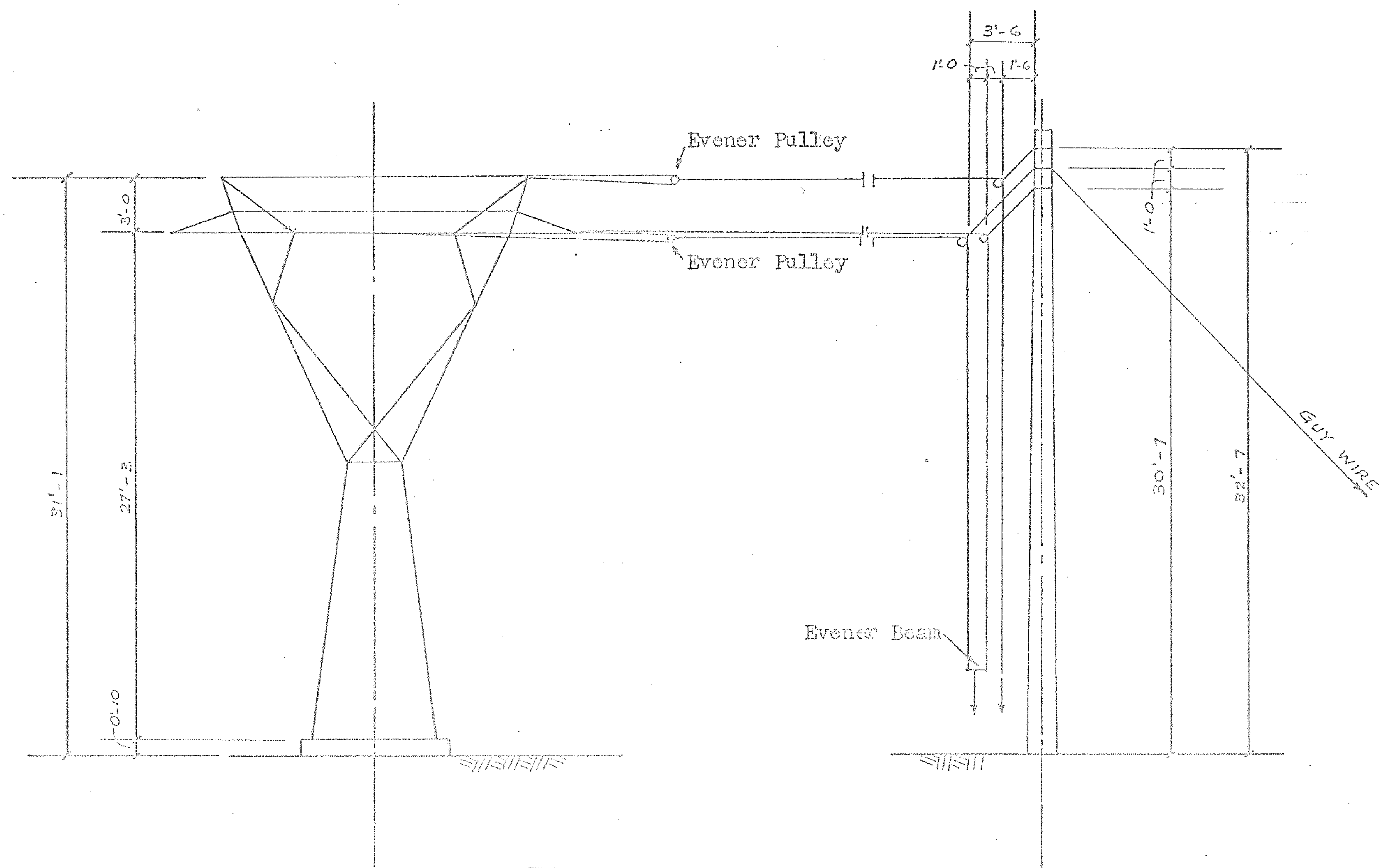
The pole was then anchored by a guy cable to the wall of the Civil Laboratory at ground level. Since the guy cable was not in line with the applied transverse load, it was necessary to resist the resulting load component with a strut to avoid deflection of the pole under load.

The pole was equipped with several eye bolts installed at heights corresponding to the points of transverse load application. Since there are five loading points for the transverse loads, evener pulleys were used to reduce the number of load lines so that one cage was used for loading either the ground wire or the conductor suspension points. In the case of the latter, an evener beam was further required to distribute the load in a ratio of 2:1 to the load lines.

A makeshift brace and eye bolt was attached to the pole for suspending the test load temporarily between tests to avoid excessive handling of weights. (See Plate VIII A).

Calibration of Dynamometer

Since it was not possible to read mechanical dynamometers on the tower during tests (due to undesirable stress influence on members and danger to the reader) and not feasible to use electrical load cells (due to existing large number of strain gages already installed), it was decided to apply dead loads and to accept some degree



TRANSVERSE LOADING ARRANGEMENT

FIGURE 8 E

of friction loss the magnitude of which could be approximately determined by subsequent friction loss tests.

To determine the magnitude of losses of test load due to friction in the cable sheaves, a dynamometer (see calibration curve Figure 8 F) was placed between the conductor suspension point and the longitudinal loading cable.

As the test load was applied, control dynamometer readings were taken at the various load increments. The load cable was struck a sharp blow with a 4 ft. long 2" x 4" timber prior to every reading in order to force the sheave to arrive at a near motionless and frictionless position.

The results of the calibration adjusted dynamometer readings versus the actually applied load are recorded on Table VIII A. The perusal of this table will demonstrate that friction losses vary between 12.8% and 1.1% of the applied load depending on the number of blows given to the load cable.

An average value of 8.2% was computed for a maximum of three blows applied to the cable. It was therefore decided to accept this degree of loss and to strike the cable three times prior to each stress measurement, since for a determination of stress <u>distribution</u>, a knowledge of the precise magnitude of the applied load is not a prerequisite.

Load Applied pounds	Dynamometer Reading on Tower pounds	Dynamometer Reading corrected for Calibration pounds	Friction Loss in Sheaves pounds	Comments	Change in Friction Loss when Load Cable is struck with N number of blows		
					No blows	3 blows	6 blows or more
1005	875	920	85	Cable not struck	8.4%		
1805	1675	1660	145	Cable not struck	8.0%		
2255	2100	2040	215	Cable not struck	9.5%		
2255	2175	2100	155	3 Blows on Cable		6.9%	
2255	2220	2150	105	6 Blows on Cable			4.7%
2255	2300	2230	25	Cont'd Striking			1.1%
1550	1700	1680	130	Cable not struck	8.4%		
1550	1650	1620	70	3 Blows on Cable		4.5%	
1550	1650	1620	70	6 Blows on Cable			4.5%
1055	1175	1190	135	Cable not struck	12.8%		
1055	1150	1160	105	3 Blows on Cable		9.9%	
				AVERAGE	9.4%	7.1%	3.4%

CALCULATION OF FRICTION LOSSES

TABLE VIII A

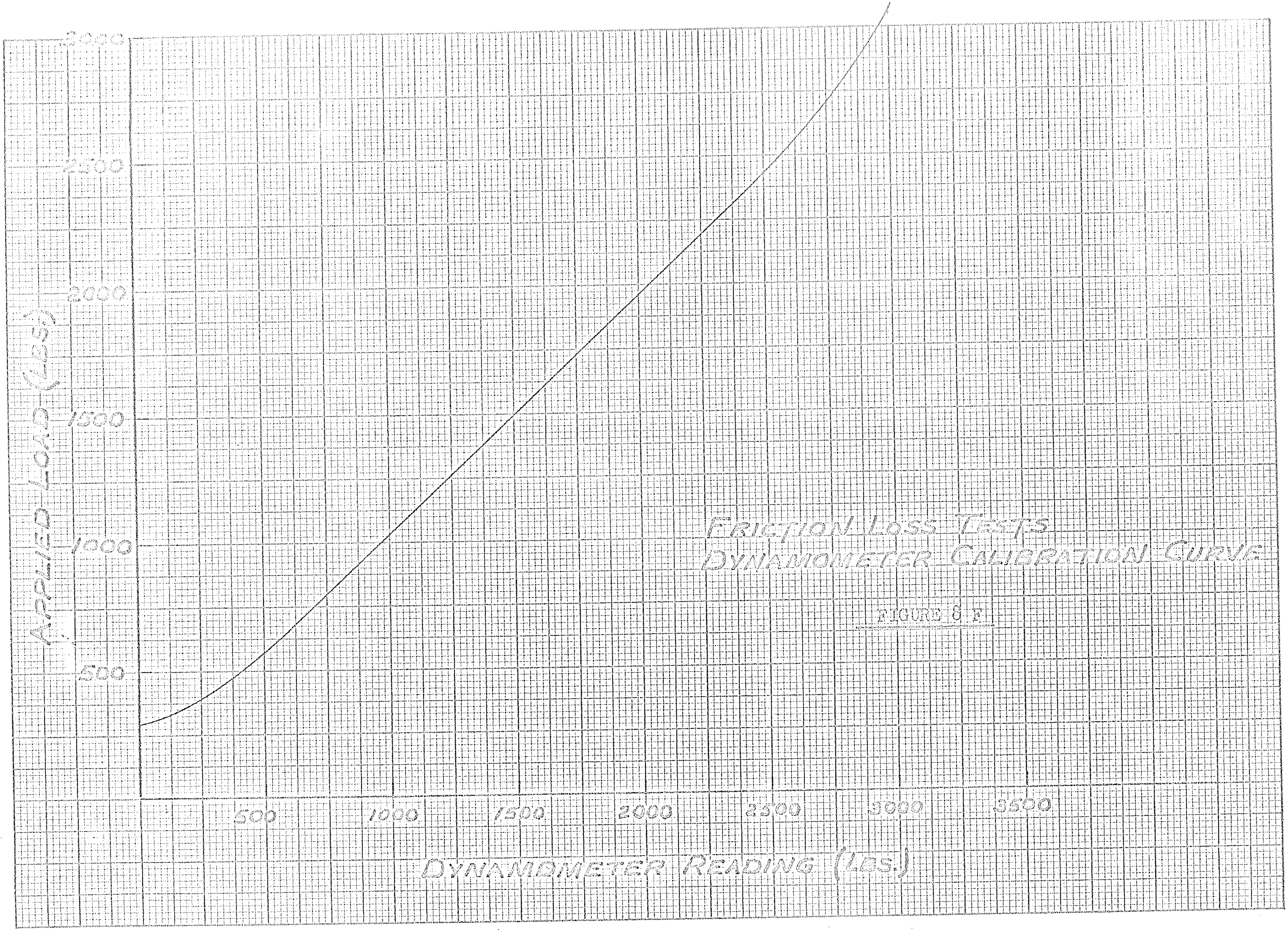

FRICTION LOSS TESTS
DYNAMOMETER CALIBRATION CURVE
APPLIED LOAD (LBS.)
500
1000
1500
2000
2500
3000
DYNAMOMETER READING (LBS.)
500
1000
1500
2000
2500
3000
3500

FIGURE 8 F

CHAPTER IX

TESTING

Instrumentation

A Digital Strain Indicator complete with the following accessory equipment was used to measure and to record the strains:

(a) Two 20 channel Switch and Balance Units complete with Input Gage Adapters

(b) Printer Control Unit

(c) Data Printer

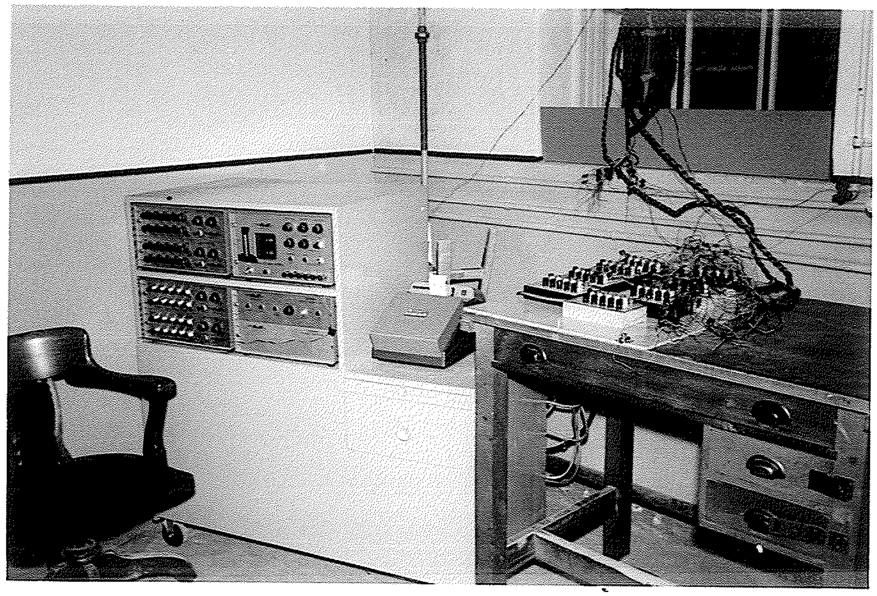
As shown in Plate IX A, the balance-indicator-recorder units have been mounted in a plywood cabinet by the University of Manitoba for portability and convenience of operation.

To cancel out any effect of temperature on the gage wire, the circuit shown in Figure 9 A was used. This circuit, commonly used in strain gage work, employs two gages as adjacent arms of the bridge, one being an 'active' gage mounted on a member being stressed and the other a 'dummy' gage mounted on an unstressed member of the same material. The latter dummy gage was freely suspended from the tower crossarm at approximately elevation + 26 ft.

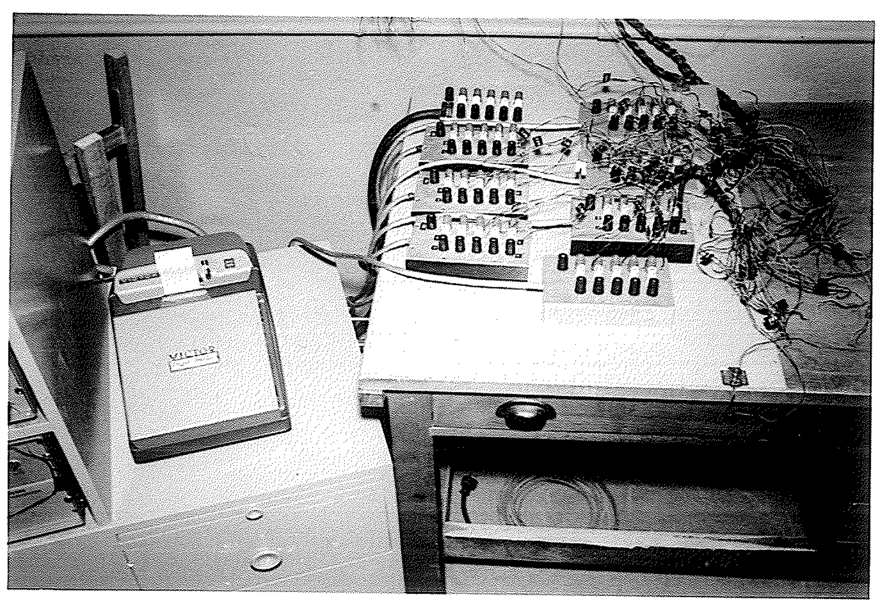
The stressed gage as well as the dummy gage are exposed to the same change in temperature during the course of strain measurement resulting in a cancelling effect of resistance changes in the filament due to temperature.

Overcoming Initial Difficulties

Prior to commencement of the actual load tests, all the 198 electrical circuits from strain gages on the erected tower to the measuring instrument were checked for continuity.

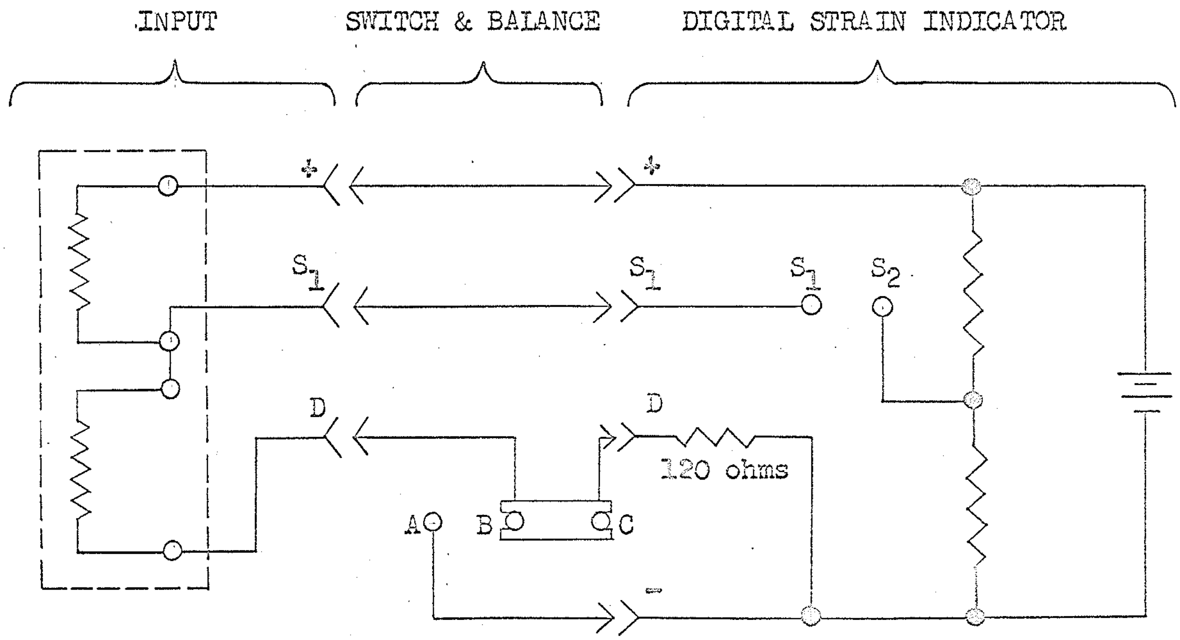


DIGITAL STRAIN INDICATOR



DATA PRINTER AND INPUT GAGE ADAPTER

PLATE IX A



ELECTRICAL CIRCUIT FOR MEASURING STRAINS
IN TOWER MEMBERS ; HALF BRIDGE POSITION

FIGURE 9 A

The first group of 36 double wires (Gages F 1 - F 36) were then connected to the input gage adapters and an attempt was made to tune in the channels at the switch and balance unit for the zero reading after a warming up period of 45 minutes. Subsequently to tuning all 36 channels to an approximate zero, the strains were recorded by manual operation of the data printer. Consecutive readings were taken after 10, 20 and 30 minutes without resetting the channels to zero reference.

It was found that the zero reading did not remain at its original position but showed a steady increase to the positive side (25-30 microinches within 30 minutes). The increase did not follow a regular pattern across the 36 gages in question.

It was suspected that these abnormal differences in the zero reading were caused by temperature changes in any or all of:

(a) the outside temperature

(b) the room temperature

(c) the instrument temperature

Therefore, thermometers were positioned on the outside of the window, in the room and on the metal front panel of the Digital Strain Indicator. The bulb of the latter thermometer was insulated against the influence of the room temperature by a protective ball of cotton open only toward the metal casing of the instrument.

An 8 inch diameter fan was placed behind the Digital Strain Indicator at a distance of 2 inches from the back of the plywood cabinet (back cover removed). The temperature of the instrument, from now on, could be held at a desired level by blowing a larger or lesser volume of air into the instrument. The room temperature was regulated by opening the window as required.

For further control, it was decided to take strain readings during those time periods of the day when the outside temperature changes were at a minimum i.e. not more than 1^{o}F per hour up or down. The location of the tower was such that it was exposed to direct sunshine for a short period before sunset and to reflected sunlight in the afternoon making it necessary to discontinue testing during these periods because of the difficulty in holding the zero reference.

It is believed that change in resistance of the lead wires due to warming by the sunlight accounted for this difficulty. The lead wires all had different lengths of exposure due to their random location in the wire bundles.

To illustrate the high sensitivity of the instrument to temperature changes of the lead wires, it was observed that by gripping the dummy gage wire in the hand for a length of about 4 inches, the strain reading decreased by 20 - 30 microinches. Generally, it was noted that:

(a) as instrument temperature increased, readings indicated tensile strain,

(b) as the dummy gage lead wire temperature increased, readings indicated compressive strain,

(c) as room temperature increased, readings indicated tensile strain.

The flow of current through the strain gages, for a prolonged period of time (up to 5 minutes), did not influence the readings, moreover the dial was noted to attain its final position in $1\frac{1}{2}$ - 2 seconds after the corresponding channel was switched in.

Many thousands of readings were recorded by operating the manual button of the instrument since the automatic recording system did not prove reliable. Although a high servo gain was set, an automatic recording corresponding to the dial readings could not be achieved. The reason for this malfunction can be attributed to the high recording speed with intervals so short that the dial had insufficient time to arrive at its proper balance position.

Another fault which occurred frequently was that the readings 008 and 009 were printed out 018 and 019, sometimes even 118 and 119. This behaviour of the Data Printer necessitated constant visual check during the test readings.

Log Book Entries

A log book was established to record immediately all the various test loadings, strain gage groups, dates, exact time of the various readings, temperatures (outside, room, instrument), coarse and fine setting of the balance switches, and other pertinent data.

The entries made in the log book were repeated on the strain recording tapes for easy identification and a check on recorded data.

Sequence of Test Load Application

When the load tests were conducted, the channels of the Digital Strain Indicator were generally tuned to their zero position prior to the test load application. However, when consecutive readings for the same loading but for various gage groups were taken, the tuning of gage channels was also done with the test load in position. After completion of the zero tuning, the test load was taken off and final strain readings were recorded, bearing in mind that the indication of strain is deduced from the difference between the initial tuning and the final reading alone.

To compensate for the reverse movement of the strain indicating dial, all readings obtained by the latter procedure were multiplied by -1. The saving of testing time and loading work achieved by this method was essential.

CHAPTER X

ANALYSIS OF TESTS

Averaging Recorded Data

The evaluation of strain readings from the values recorded by the Data Printer recording tape was carried out by the following uniform procedure.

For the sets of 'zero' reference readings the arithmetic mean was computed for every gage when only two or three sets of readings had been recorded. In cases, however, where four or more sets had been recorded an average of only the last two sets was considered to represent the initial 'zero' value. These mean values were tabulated on the 'Strain Readings and Member Loads' data sheet in microinches per inch (See Appendix A).

For the sets of 'load' readings the arithmetic mean of all sets of readings was computed for each particular gage and these means were similarly entered into the 'Strain Readings and Member Loads' data sheets (See Appendix A).

Importance of Zero Control Readings

As outlined earlier the initial zero reading underwent continuous changes caused by variation in temperature. It was therefore of utmost importance to take intermediate zero readings during load tests of longer duration. These control readings made it possible to introduce a 'time correction' which was applied to every calculated member load prior to further evaluation. The time corrections as used are recorded in Appendix B. For obvious reasons these adjustments carry the opposite sign of the deviation from the initial zero reference.

Calculation of Loads

As stated above the 'zero' and 'load' readings were recorded on data sheets in Appendix A. The difference between 'zero' and 'load' representing the actual strain was then tabulated and multiplied by Youngs Modulus (30×10^3 kips per square inch for steel material) resulting in the stress at the location of the gage (kips per square inch).

Using the stress coefficients for the final equations, as computed on Figures 10 A to 10 D and summarized on Table 10 E, the axial loads for the respective members were calculated and tabulated.

Averaging Calculated Loads

To arrive at comparable load values for the various tests on the 'Summary of Member Loads' (Appendix B), the following procedures were applied:

(a) It was decided to adjust all transverse test loads to a load level which is most suited for comparison purposes i.e.

2350 pounds for transverse loads at three conductor points

1100 pounds for transverse load at ground wire point.

Consequently, the calculated member loads for each respective member were multiplied by a coefficient of

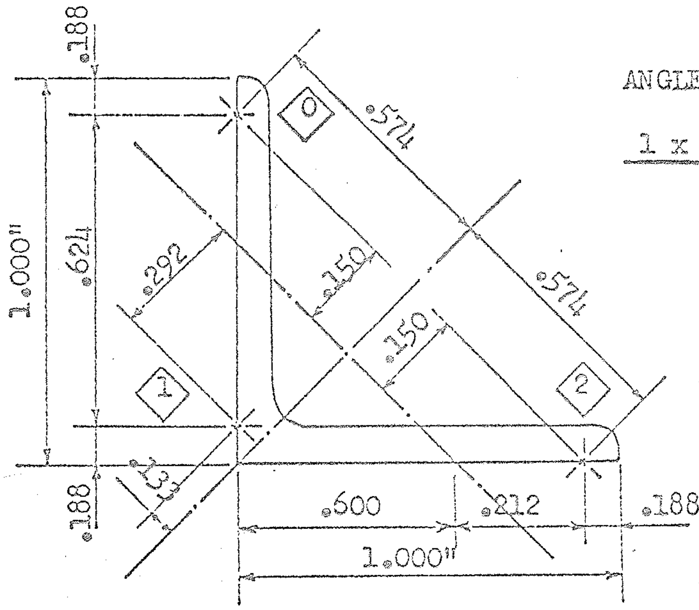
$\frac{2350}{3022} =$ 0.778 for the transverse conductor load test of Oct. 9th and 10th, 1964

$\frac{1100}{1605} =$ 0.685 for the transverse ground wire load test of Oct. 8th, 1964

The corrected values obtained were then inserted into column (f) of the 'Summary of Member Loads' (Appendix B).

ANGLE SECTION

$1 \times 1 \times {}^{1}/8"$



$$F_o = A - 0.150\ C + 0.574\ B \qquad (1)$$

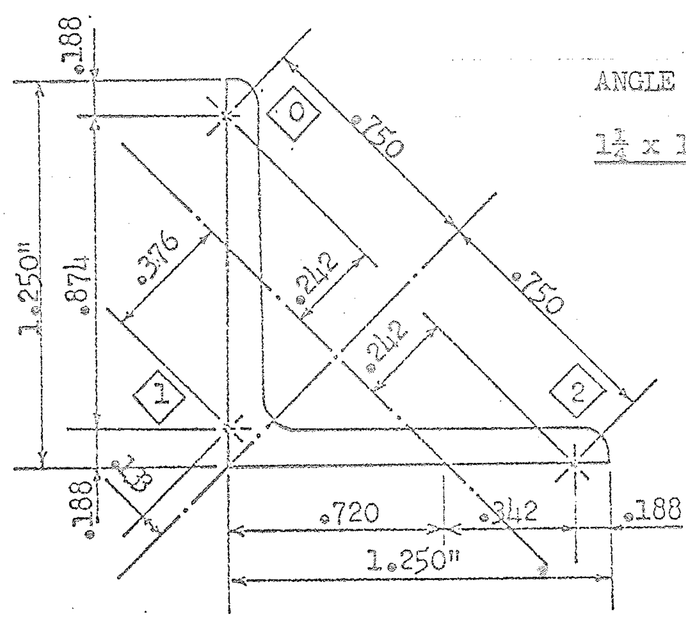
$$F_1 = A + 0.292\ C + 0.133\ B \qquad (2)$$

$$F_2 = A - 0.150\ C - 0.574\ B \qquad (3)$$

$$A = 0.291\ F_o + 0.337\ F_1 + 0.369\ F_2$$

ANGLE SECTION

$1\frac{1}{4} \times 1\frac{1}{4} \times {}^{1}/8"$



$$F_o = A - 0.242\ C + 0.750\ B$$

$$F_1 = A + 0.376\ C + 0.133\ B$$

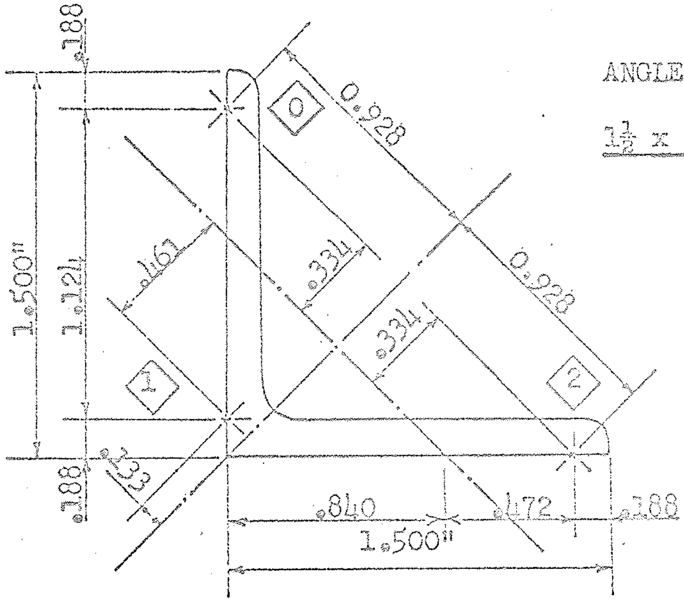
$$F_2 = A - 0.242\ C - 0.750\ B$$

$$A = 0.270\ F_o + 0.391\ F_1 + 0.340\ F_2$$

FIGURE 10 A

ANGLE SECTION

$1\frac{1}{2} \times 1\frac{1}{2} \times {}^{1}/8''$



$$F_o = A - 0.334\ C + 0.928\ B$$

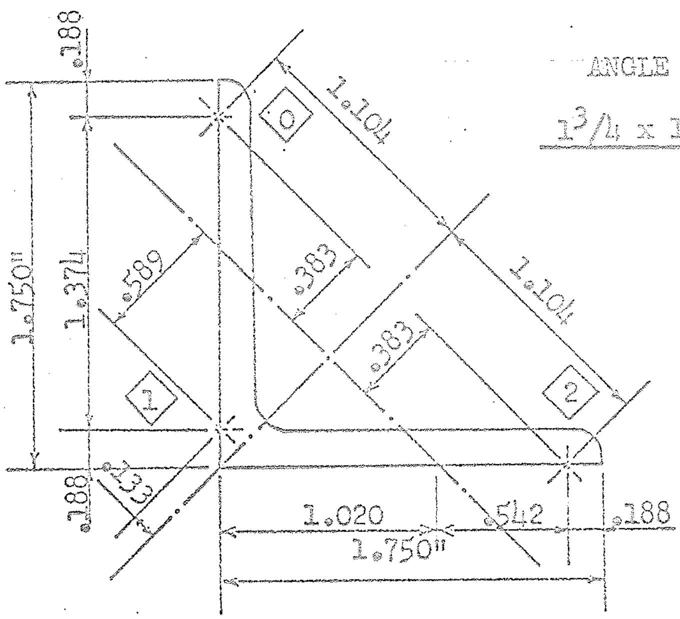
$$F_1 = A + 0.461\ C + 0.133\ B$$

$$F_2 = A - 0.334\ C - 0.928\ B$$

$$A = 0.260\ F_o + 0.420\ F_1 + 0.321\ F_2$$

ANGLE SECTION

$1^3/4 \times 1^3/4 \times {}^3/16''$



$$F_o = A - 0.383\ C + 1.104\ B$$

$$F_1 = A + 0.589\ C + 0.133\ B$$

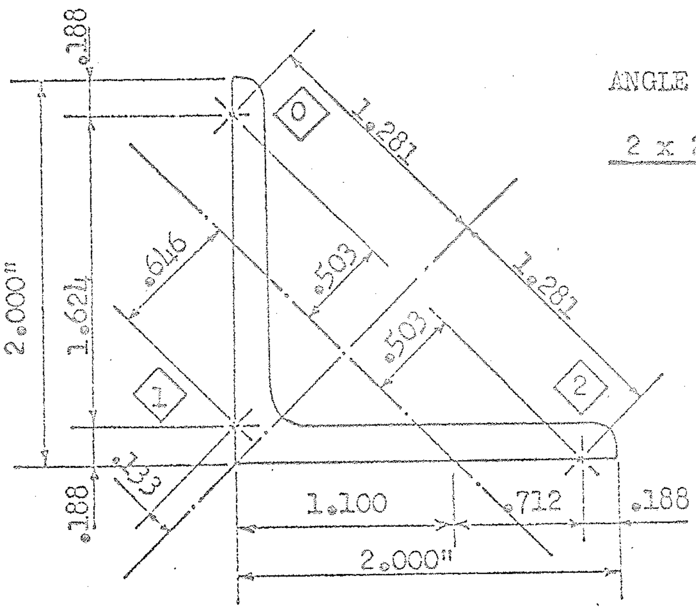
$$F_2 = A - 0.383\ C - 1.104\ B$$

$$A = 0.279\ F_o + 0.394\ F_1 + 0.326\ F_2$$

FIGURE 10 B

ANGLE SECTION

2 x 2 x 1/8"



$$F_0 = A - 0.503\ C + 1.281\ B$$

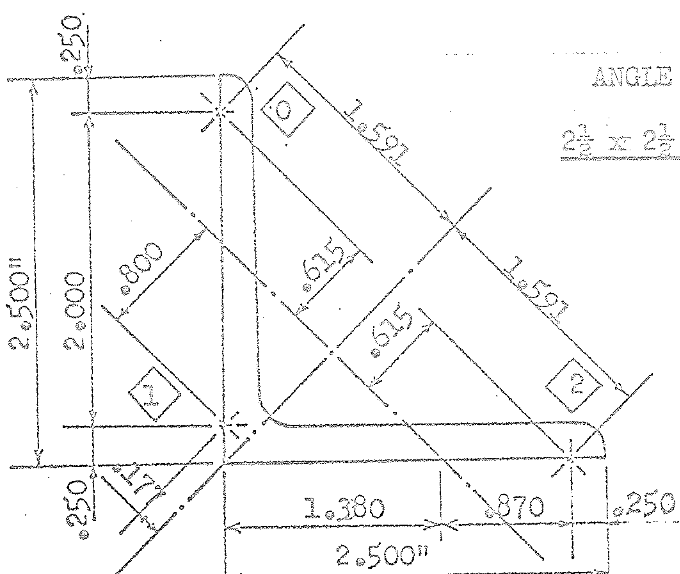
$$F_1 = A + 0.646\ C + 0.133\ B$$

$$F_2 = A - 0.503\ C - 1.281\ B$$

$$A = 0.258\ F_0 + 0.438\ F_1 + 0.304\ F_2$$

ANGLE SECTION

$2\frac{1}{2}$ x $2\frac{1}{2}$ x 3/16"



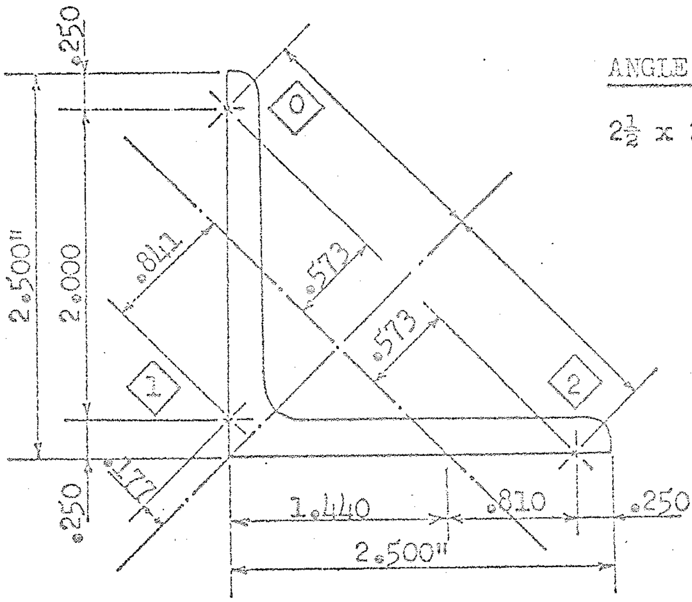
$$F_0 = A - 0.615\ C + 1.591\ B$$

$$F_1 = A + 0.799\ C + 0.177\ B$$

$$F_2 = A - 0.615\ C - 1.591\ B$$

$$A = 0.258\ F_0 + 0.435\ F_1 + 0.307\ F_2$$

FIGURE 10 C



ANGLE SECTION

$2\frac{1}{2} \times 2\frac{1}{2} \times 1/4"$

$$F_0 = A - 0.573\ C + 1.591\ B$$

$$F_1 = A + 0.841\ C + 0.177\ B$$

$$F_2 = A - 0.573\ C - 1.591\ B$$

$$A = 0.275\ F_0 + 0.406\ F_1 + 0.320\ F_2$$

FIGURE 10 D

ANALYSIS OF TESTS

EQUATIONS FOR AXIAL LOAD COMPUTATION

Angle Section	Area in^2	
$1 \times 1 \times \frac{1}{8}$"	0.23	$\frac{\text{Load}}{\text{Area}} = 0.291\ F_o + 0.337\ F_1 + 0.369\ F_2$ $\text{Load} = 0.067\ F_o + 0.078\ F_1 + 0.085\ F_2$
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{8}$"	0.30	$\frac{\text{Load}}{\text{Area}} = 0.270\ F_o + 0.391\ F_1 + 0.340\ F_2$ $\text{Load} = 0.081\ F_o + 0.117\ F_1 + 0.102\ F_2$
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{8}$"	0.36	$\frac{\text{Load}}{\text{Area}} = 0.260\ F_o + 0.420\ F_1 + 0.321\ F_2$ $\text{Load} = 0.094\ F_o + 0.151\ F_1 + 0.116\ F_2$
$1\frac{3}{4} \times 1\frac{3}{4} \times \frac{3}{16}$	0.62	$\frac{\text{Load}}{\text{Area}} = 0.279\ F_o + 0.395\ F_1 + 0.326\ F_2$ $\text{Load} = 0.173\ F_o + 0.244\ F_1 + 0.202\ F_2$
$2 \times 2 \times \frac{1}{8}$"	0.48	$\frac{\text{Load}}{\text{Area}} = 0.258\ F_o + 0.438\ F_1 + 0.304\ F_2$ $\text{Load} = 0.124\ F_o + 0.210\ F_1 + 0.146\ F_2$
$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$	0.90	$\frac{\text{Load}}{\text{Area}} = 0.258\ F_o + 0.435\ F_1 + 0.307\ F_2$ $\text{Load} = 0.232\ F_o + 0.392\ F_1 + 0.276\ F_2$
$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$"	1.19	$\frac{\text{Load}}{\text{Area}} = 0.275\ F_o + 0.406\ F_1 + 0.320\ F_2$ $\text{Load} = 0.327\ F_o + 0.483\ F_1 + 0.381\ F_2$

TABLE X E

(b) Similarly it was decided to adjust all longitudinal test loads to the suitable load levels of:

2255 pounds for longitudinal loads at conductor point

2455 pounds for longitudinal loads at ground wire point.

The calculated member loads for the respective members had to be multiplied by coefficients of:

$\frac{2255}{2305} =$ 0.978 for the longitudinal load test at conductor point of Oct. 5th, 1964

$\frac{2255}{2455} =$ 0.920 for the longitudinal load test at conductor point of Oct. 24th, 1964

$\frac{2455}{2505} =$ 0.980 for the longitudinal load test at ground wire point of Oct. 6th, 1964

The corrected values obtained were then inserted into column (b) of the 'Summary of Member Loads' (Appendix B).

Prior to October 10th, 1964, combined load tests with longitudinal and transverse loads applied simultaneously were not conducted. Therefore, a second value for the member loads for this loading was required since a mathematical check of test results was desirable. An artificial value was obtained by adding the member loads from the longitudinal load tests and those of the transverse load tests. These values tabulated under column (j) are marked with an asterisk (*).

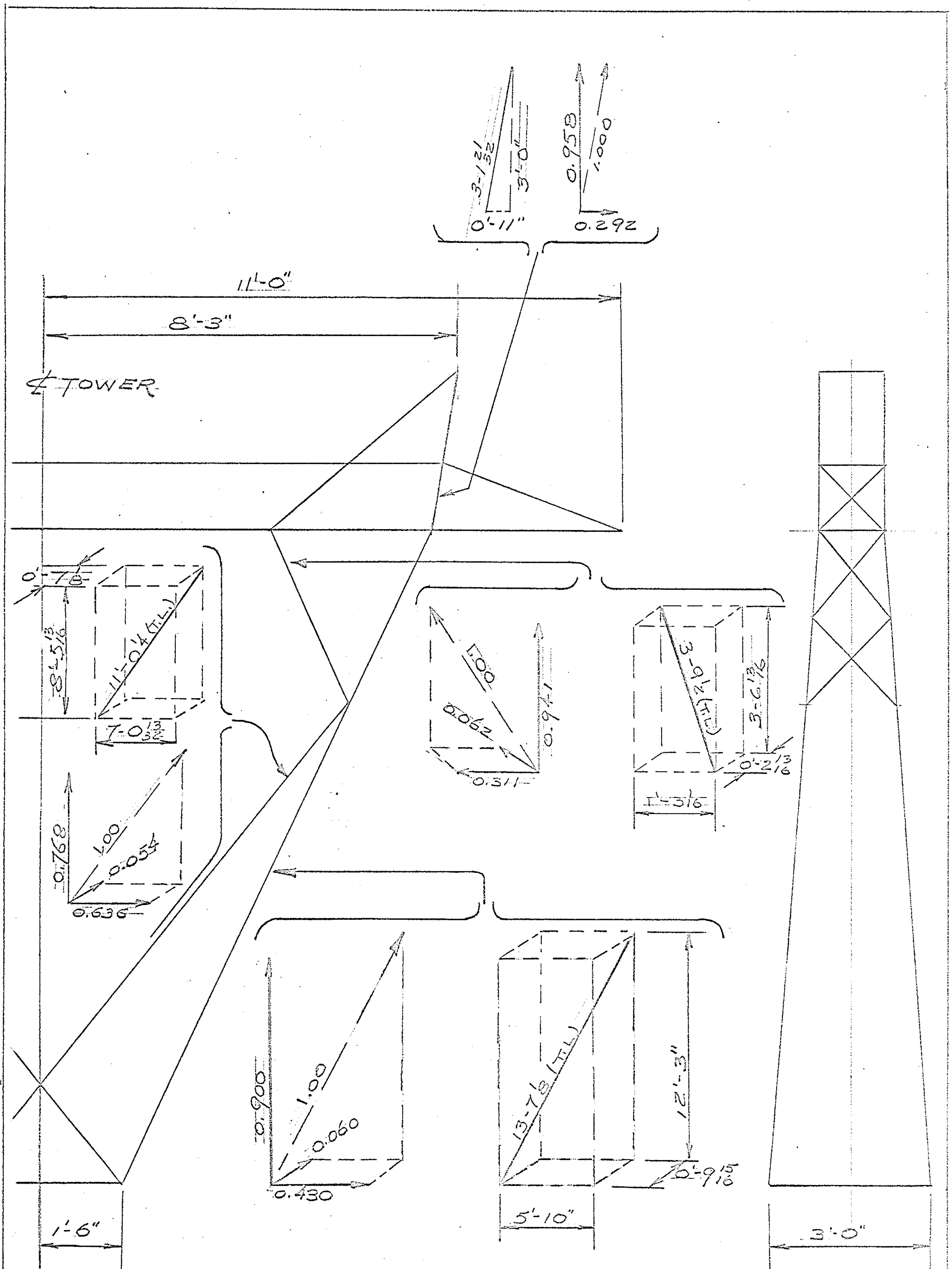
A percentage of error was calculated for purposes of comparison only, and this percentage was found by adding the two values in question regardless of their sign. The sum obtained then was related to the figure of column (m) indicating a percentage error.

The percentages of error range from 0 - 16.6% with an overall average of 4.2%. In a few cases the percentage was not calculated due to very small load readings which may lead to erroneous conclusions.

Determination of Indicated Load Components at Control Points

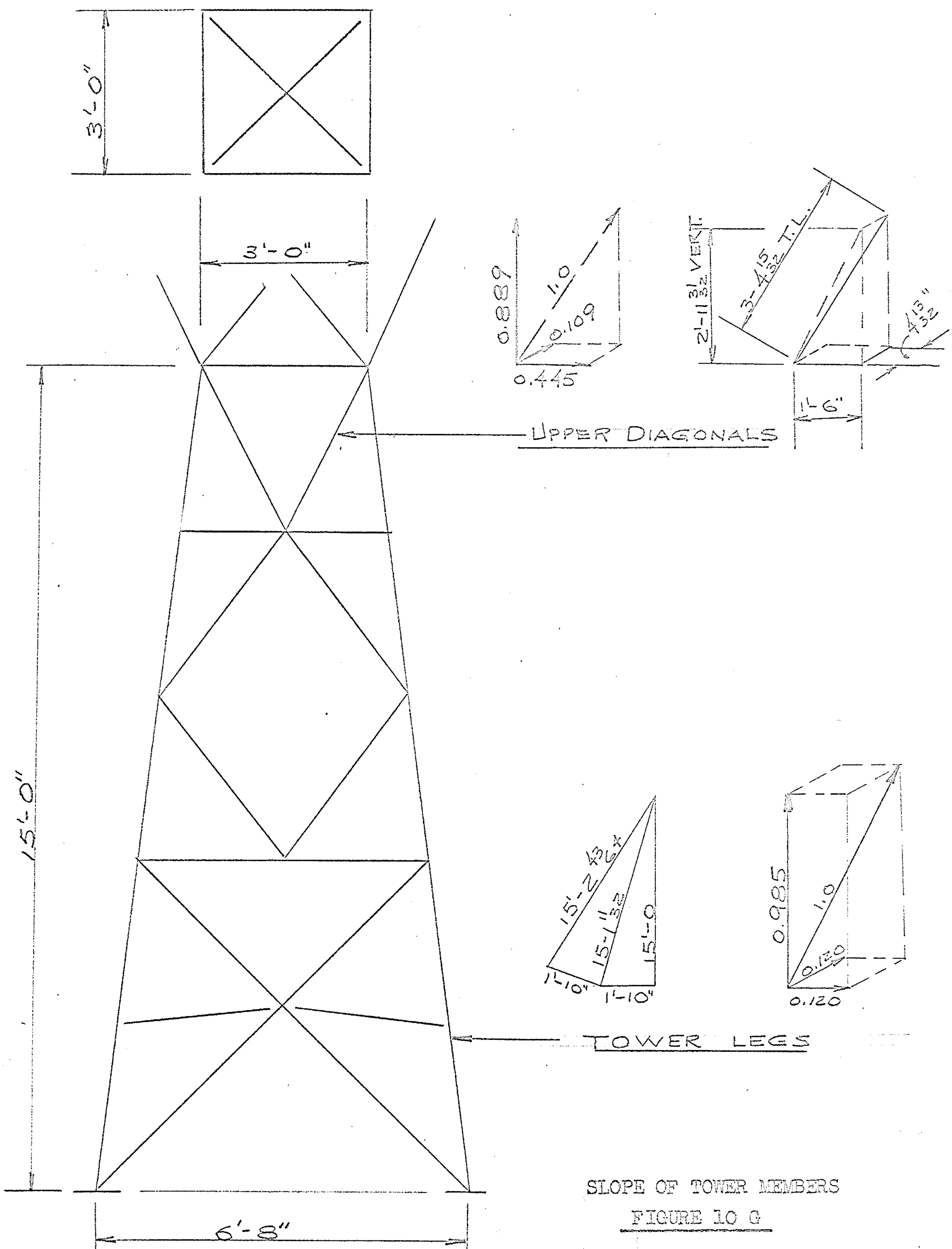
From the average member loads listed in Appendix B the stresses in all related members were determined by graphical analysis. Having all of the necessary stresses in the pertinent frames, it was then possible, by means of predetermined member slopes shown in Figures 10 F and 10 G, to obtain vertical and horizontal load components at the support point, waist, and tower base.

These calculations are performed on pages 95 to 143 and are summarized on Figures 10 H, 10 J, 10 K and 10 M.



SLOPE OF TOWER MEMBERS

FIGURE 10 F



SLOPE OF TOWER MEMBERS

FIGURE 10 G

LONGITUDINAL LOAD AT WEST GROUND WIRE SUPPORT POINT

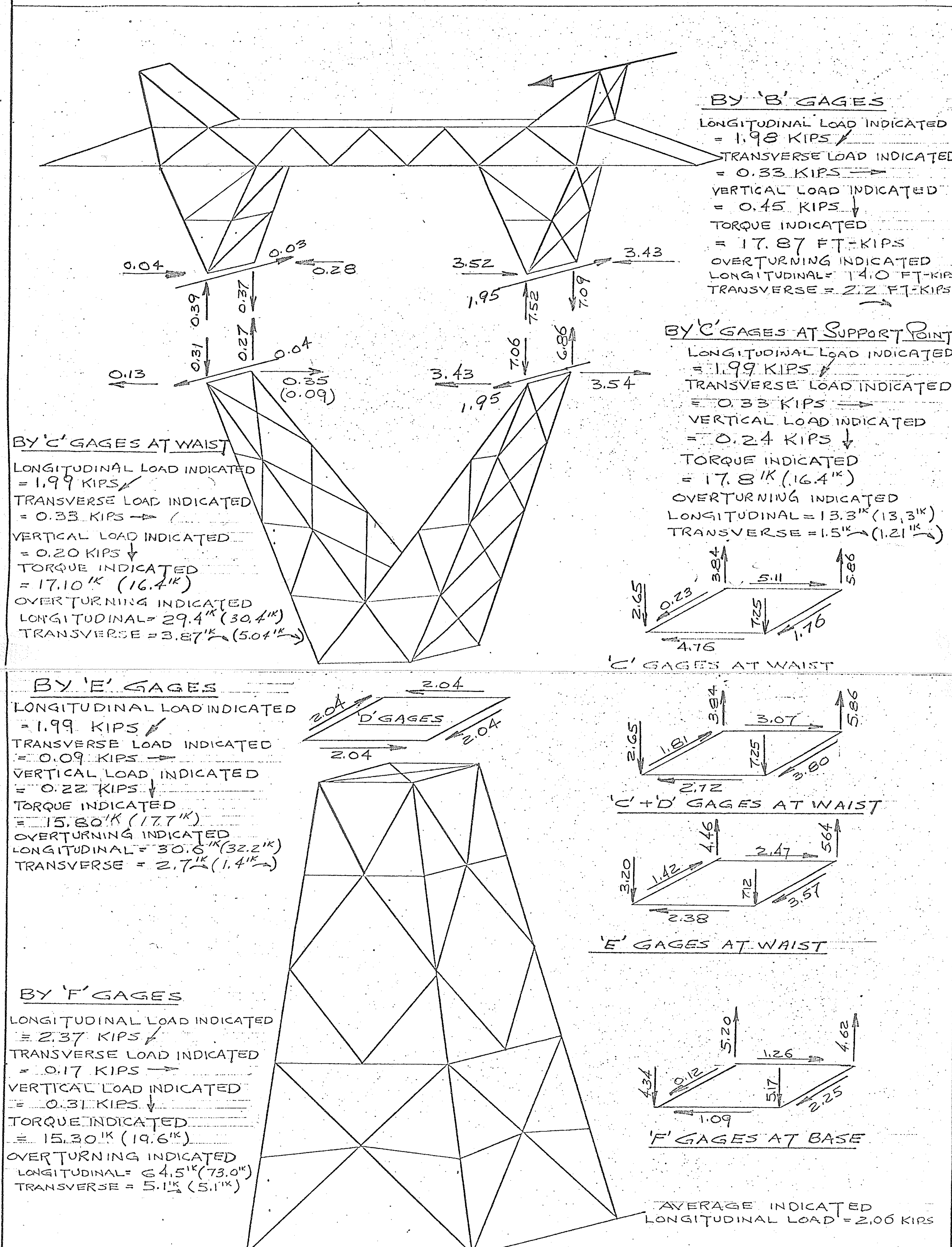


FIGURE 10 H

TRANSVERSE LOAD AT GROUND WIRE SUPPORT POINT

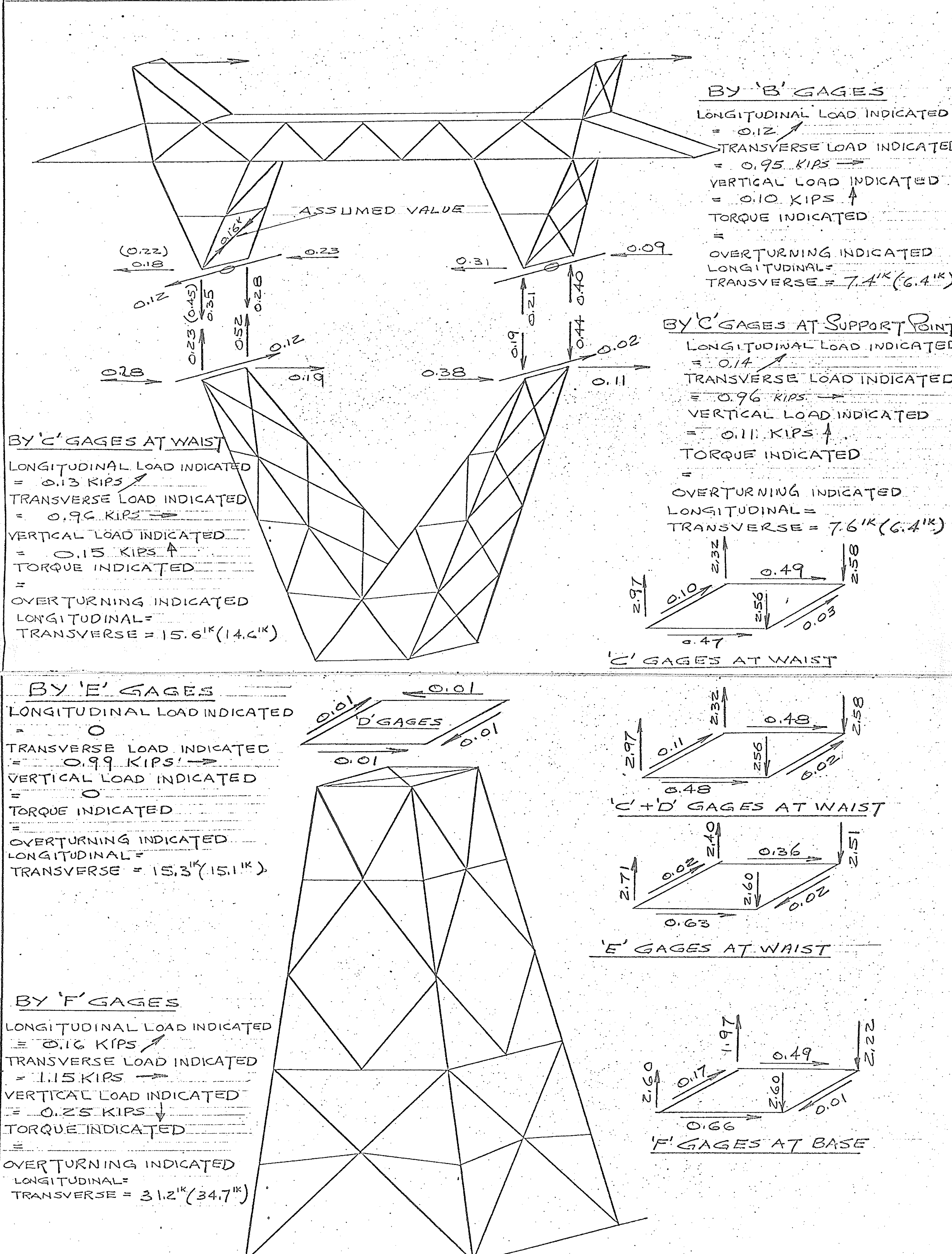
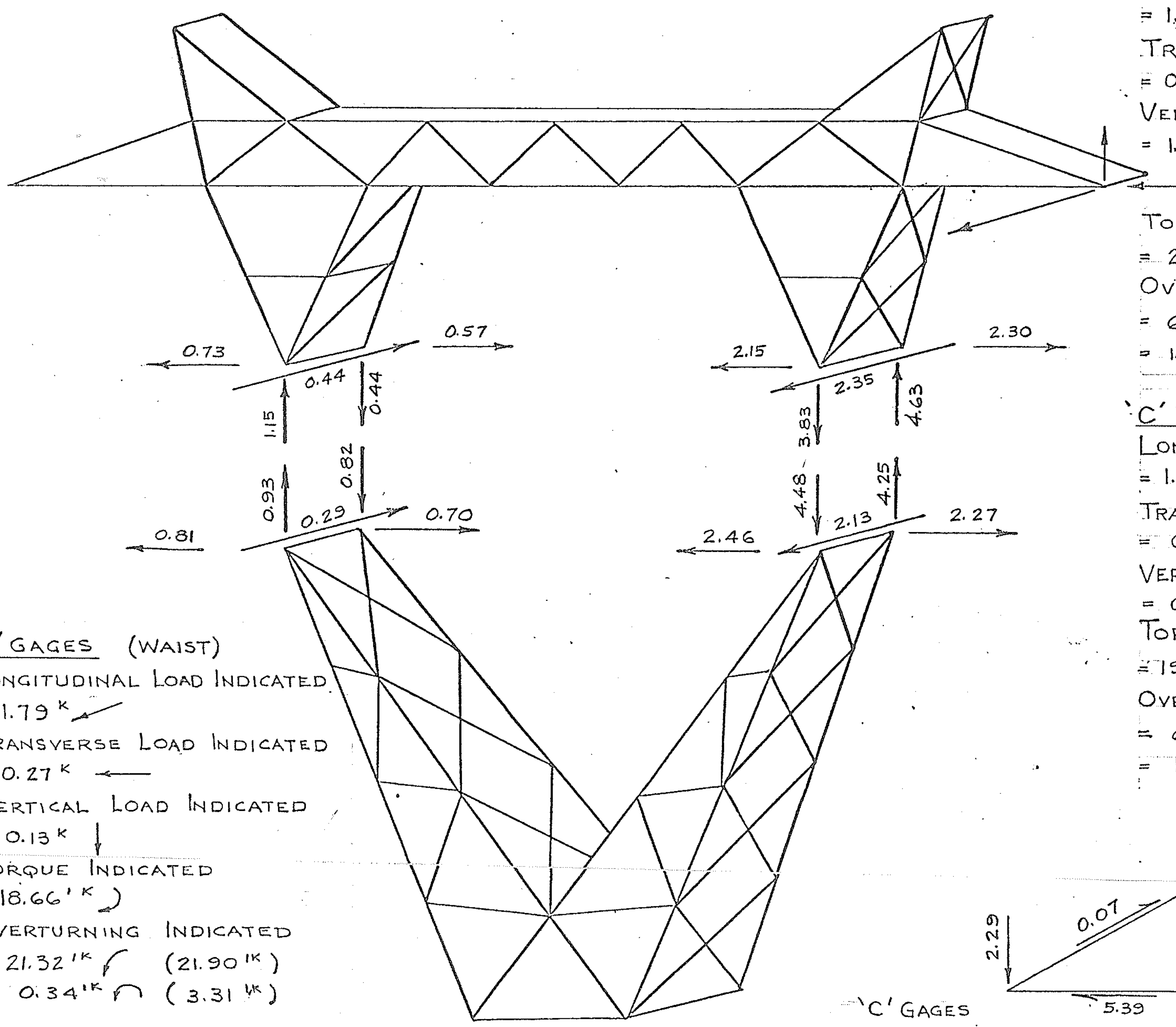


FIGURE 10 J

LONGITUDINAL LOAD AT WEST CONDUCTOR SUPPORT POINT

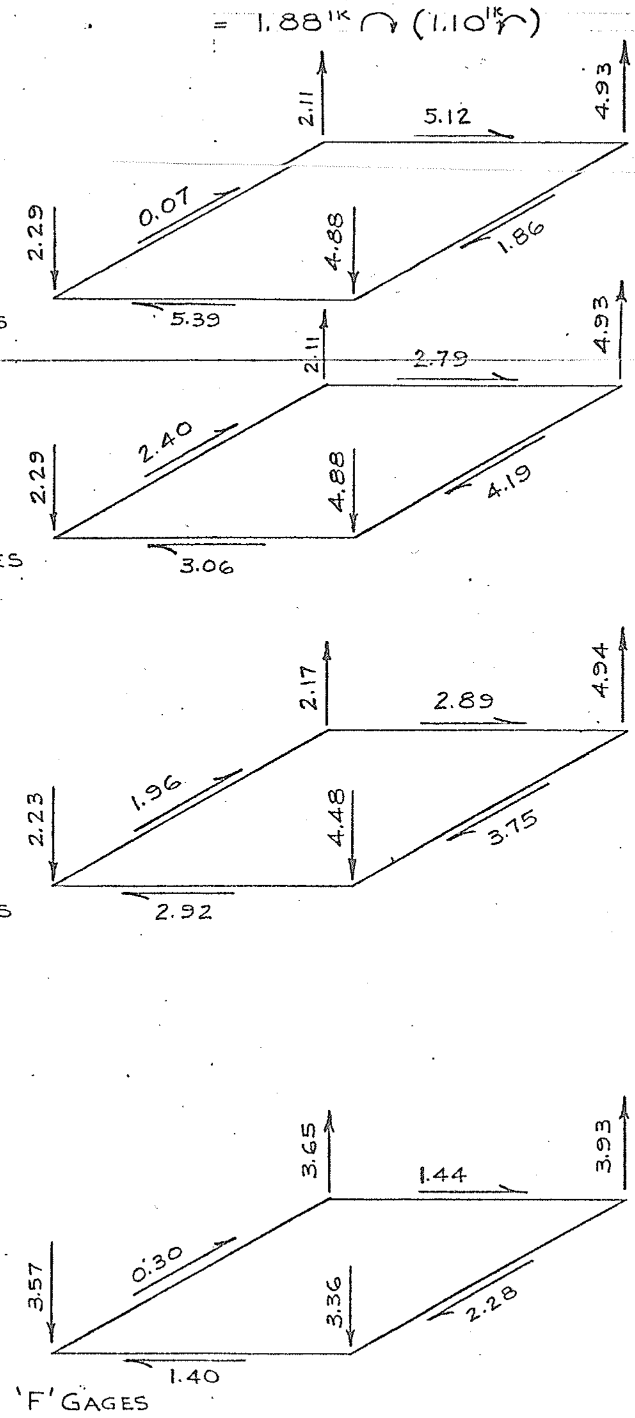
SUMMARY OF STRESSES



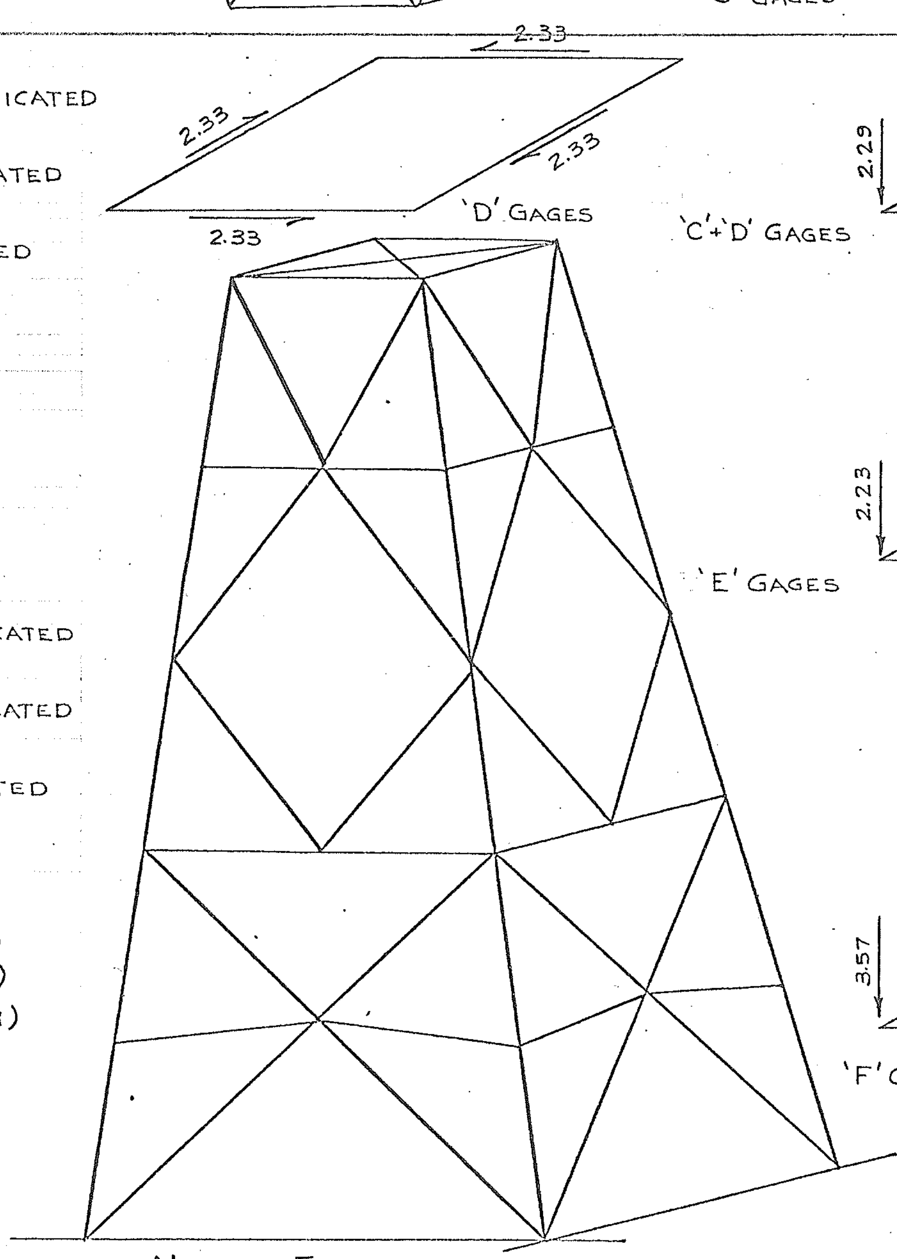
'B' GAGES
LONGITUDINAL LOAD INDICATED
= 1.91 K
TRANSVERSE LOAD INDICATED
= 0.01 K
VERTICAL LOAD INDICATED
= 1.51 K
TORQUE INDICATED
= 20.97 'K
OVERTURNING INDICATED
= 6.27 'K (6.54 'K)
= 1.01 'K (0.03 'K)

'C' GAGES
LONGITUDINAL LOAD INDICATED
= 1.84 K
TRANSVERSE LOAD INDICATED
= 0.30 K
VERTICAL LOAD INDICATED
= 0.12 K
TORQUE INDICATED
= 19.03 'K
OVERTURNING INDICATED
= 6.27 'K (6.75 'K)
= 1.88 'K (1.10 'K)

'C' GAGES (WAIST)
LONGITUDINAL LOAD INDICATED
= 1.79 K
TRANSVERSE LOAD INDICATED
= 0.27 K
VERTICAL LOAD INDICATED
= 0.13 K
TORQUE INDICATED
= 18.66 'K
OVERTURNING INDICATED
= 21.32 'K (21.90 'K)
= 0.34 'K (3.31 'K)



'E' GAGES
LONGITUDINAL LOAD INDICATED
= 1.79 K
TRANSVERSE LOAD INDICATED
= 0.03 K
VERTICAL LOAD INDICATED
= 0.40 K
TORQUE INDICATED
= 17.28 'K
OVERTURNING INDICATED
= 20.73 'K (21.90 'K)
= 0.78 'K (0.37 'K)



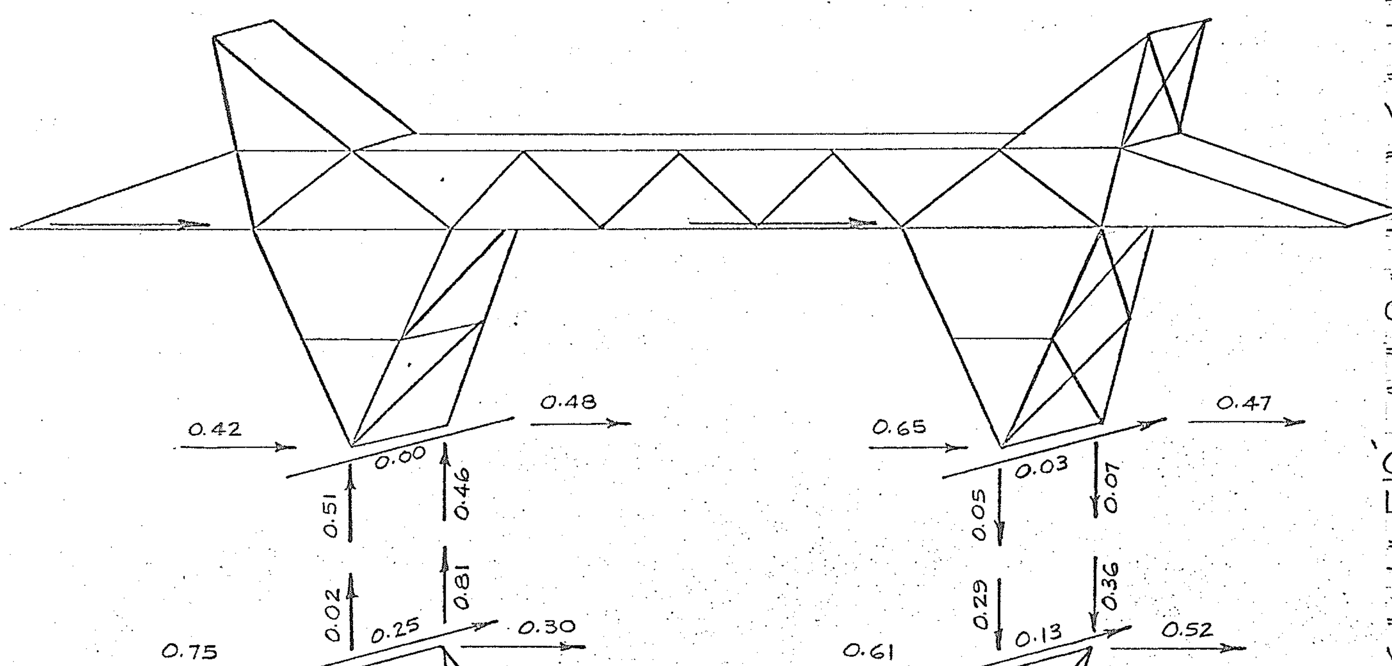
'F' GAGES
LONGITUDINAL LOAD INDICATED
= 1.98 K
TRANSVERSE LOAD INDICATED
= 0.04 K
VERTICAL LOAD INDICATED
= 0.65 K
TORQUE INDICATED
= 18.05 'K
OVERTURNING INDICATED
= 48.40 'K (54.00 'K)
= 1.63 'K (1.09 'K)

FIGURE 10 K

TRANSVERSE LOAD AT CONDUCTOR SUPPORT POINTS

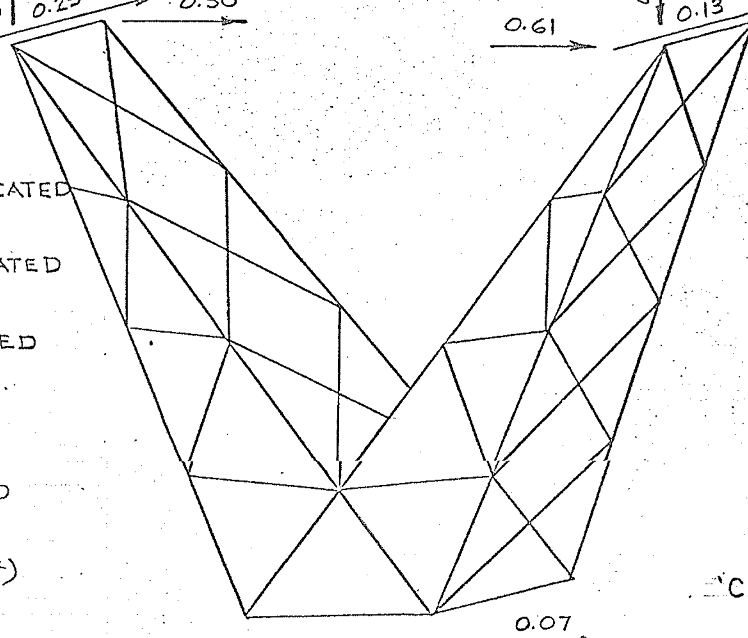
SUMMARY OF STRESSES

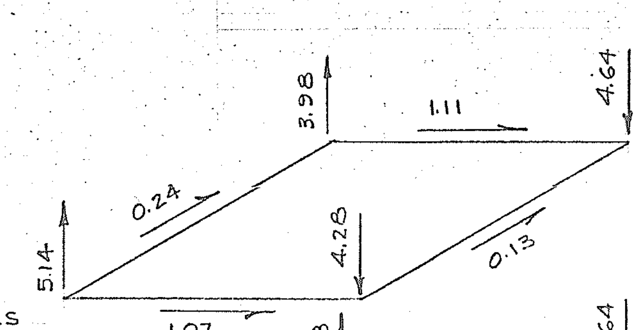
'B' GAGES
LONGITUDINAL LOAD INDICATED
= 0.03ᴷ
TRANSVERSE LOAD INDICATED
= 2.02ᴷ
VERTICAL LOAD INDICATED
= 0.85ᴷ
TORQUE INDICATED
= 0.28ᴵᴷ
OVERTURNING INDICATED
= 0.06ᴵᴷ (0.10ᴵᴷ)
= 6.15ᴵᴷ (6.91ᴵᴷ)



'C' GAGES
LONGITUDINAL LOAD INDICATED
= 0.38ᴷ
TRANSVERSE LOAD INDICATED
= 2.18ᴷ
VERTICAL LOAD INDICATED
= 0.18ᴷ
TORQUE INDICATED
= 0.18ᴵᴷ
OVERTURNING INDICATED
= 0.65ᴵᴷ (1.39ᴵᴷ)
= 8.21ᴵᴷ (8.00ᴵᴷ)

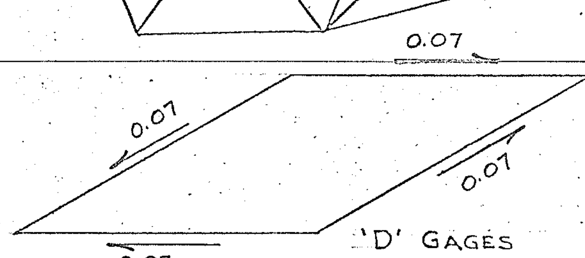
'C' GAGES (WAIST)
LONGITUDINAL LOAD INDICATED
= 0.37ᴷ
TRANSVERSE LOAD INDICATED
= 2.18ᴷ
VERTICAL LOAD INDICATED
= 0.20ᴷ
TORQUE INDICATED
= 0.225ᴵᴷ
OVERTURNING INDICATED
= 0.10ᴵᴷ (4.53ᴵᴷ)
= 27.06ᴵᴷ (26.70ᴵᴷ)



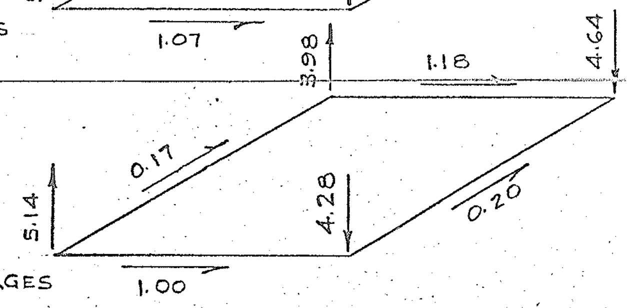


'C' GAGES

'E' GAGES
LONGITUDINAL LOAD INDICATED
= 0.03ᴷ
TRANSVERSE LOAD INDICATED
= 2.05ᴷ
VERTICAL LOAD INDICATED
= 0.52ᴷ
TORQUE INDICATED
= 0.33ᴵᴷ
OVERTURNING INDICATED
= 0.39ᴵᴷ (0.37ᴵᴷ)
= 25.26ᴵᴷ (25.10ᴵᴷ)

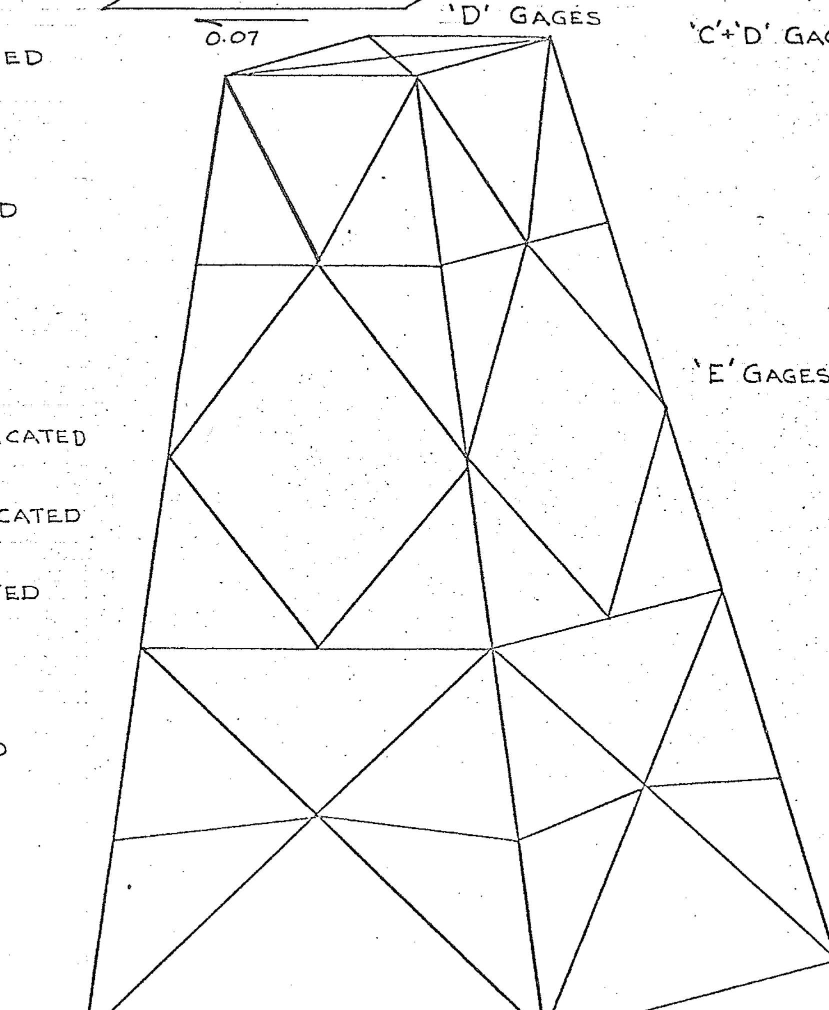


'D' GAGES

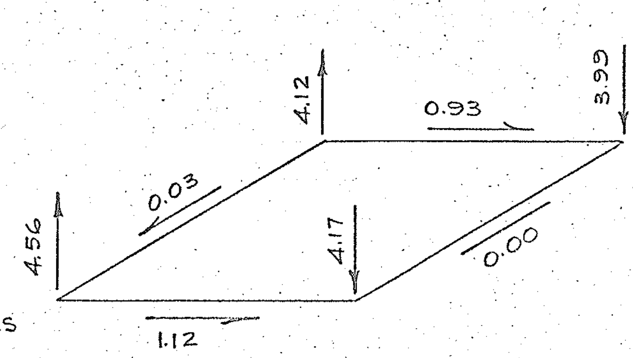


'C'+'D' GAGES

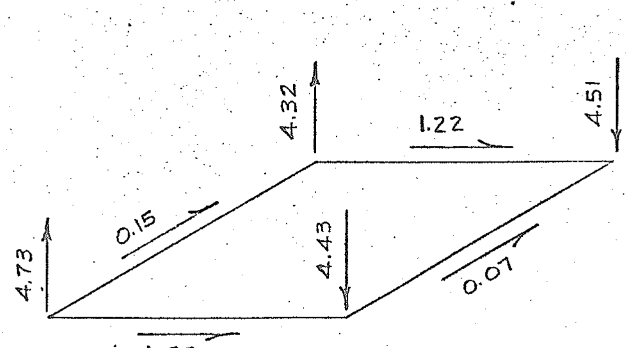
'F' GAGES
LONGITUDINAL LOAD INDICATED
= 0.22ᴷ
TRANSVERSE LOAD INDICATED
= 2.44ᴷ
VERTICAL LOAD INDICATED
= 0.11ᴷ
TORQUE INDICATED
= 0.27ᴵᴷ
OVERTURNING INDICATED
= 1.63ᴵᴷ (6.00ᴵᴷ)
= 60.00ᴵᴷ (66.60ᴵᴷ)



NORTH FACE

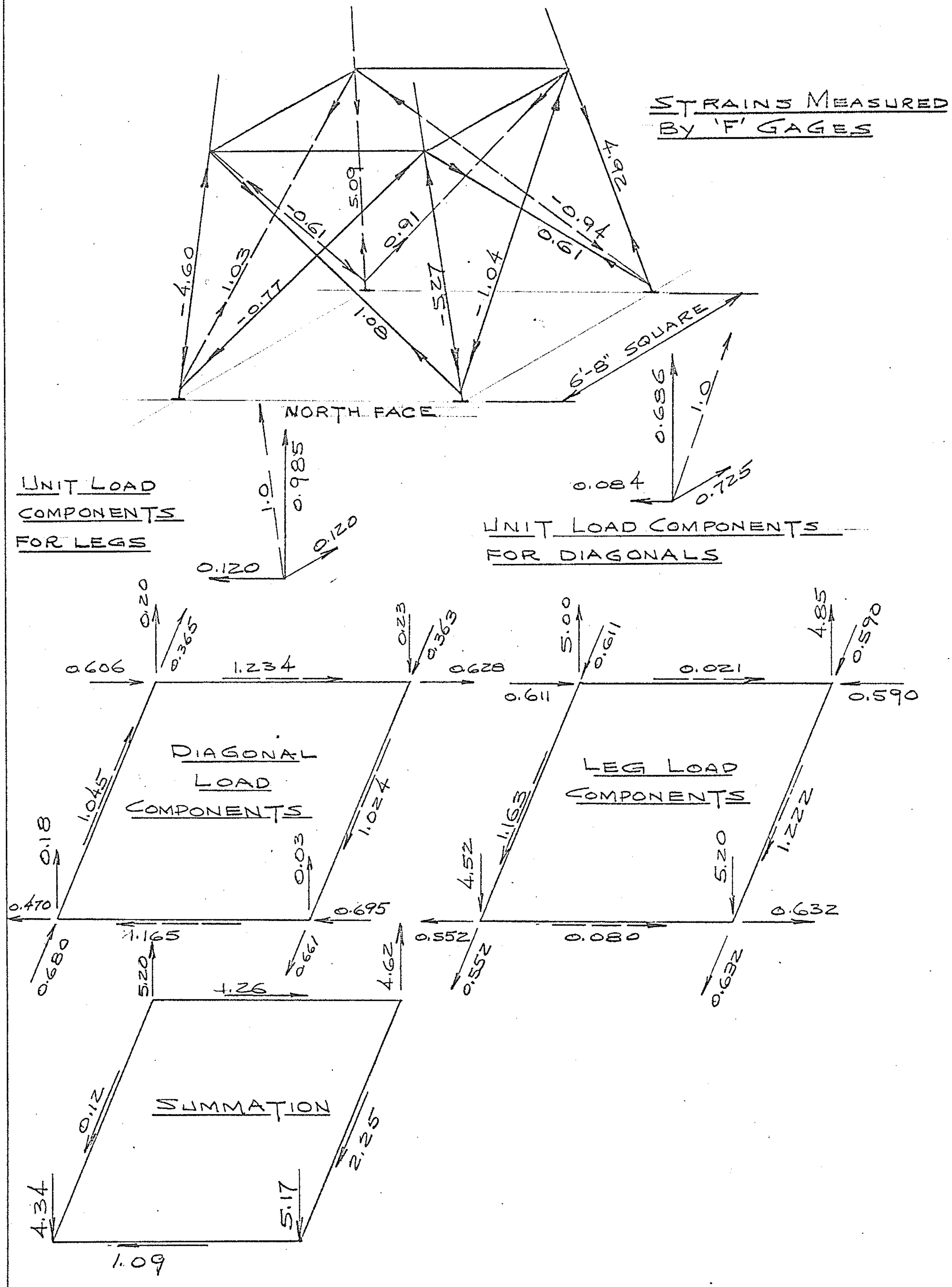


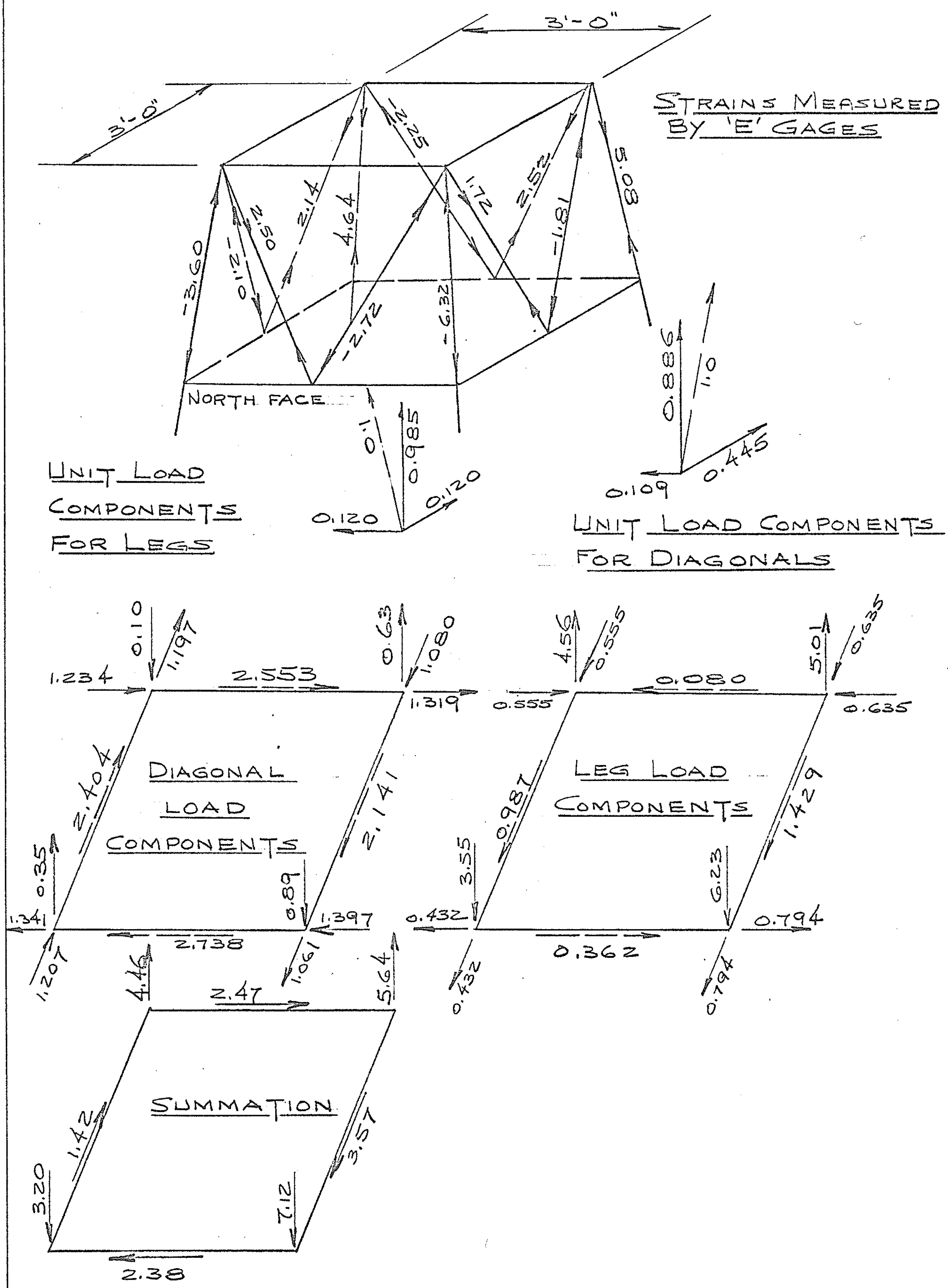
'E' GAGES

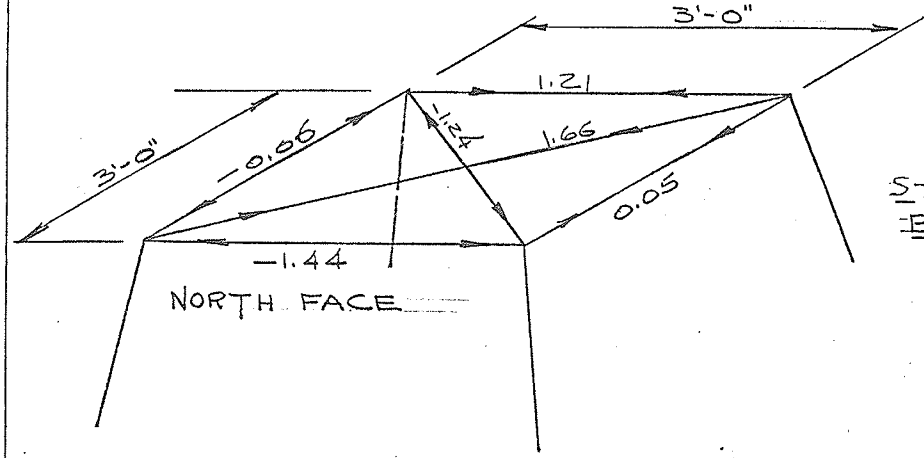


'F' GAGES

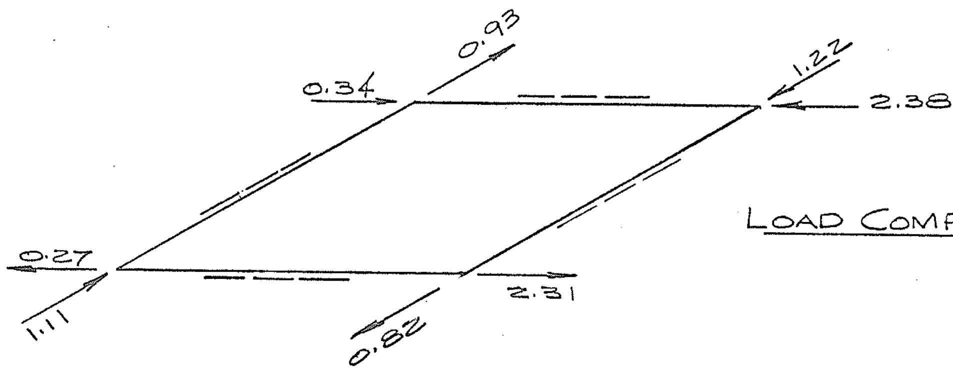
FIGURE 10 M


STRAINS MEASURED BY 'F' GAGES
NORTH FACE
6'-8" SQUARE
-4.60
1.03
-0.77
-0.61
5.09
0.91
1.08
-5.27
-1.04
0.61
-0.94
4.92
UNIT LOAD COMPONENTS FOR LEGS
1.0
0.985
0.120
0.120
UNIT LOAD COMPONENTS FOR DIAGONALS
0.686
1.0
0.084
0.725
DIAGONAL LOAD COMPONENTS
0.20
0.365
0.606
1.234
0.23
0.363
0.628
1.045
1.024
0.18
0.03
0.470
0.695
1.165
0.680
0.661
LEG LOAD COMPONENTS
5.00
0.611
0.611
0.021
4.85
0.590
0.590
1.163
1.222
4.52
5.20
0.552
0.080
0.632
0.552
0.632
SUMMATION
5.20
4.26
4.62
0.12
2.25
4.34
5.17
1.09

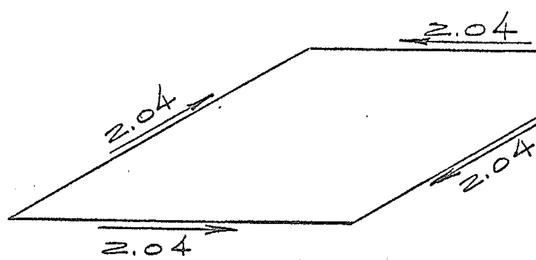

3'-0"
3'-0"
STRAINS MEASURED
BY 'E' GAGES
-2.25
2.14
4.64
-2.50
-0.12
-3.60
1.71
2.52
-1.81
5.08
-2.72
-6.32
NORTH FACE
1.0
0.985
0.120
0.120
0.886
1.0
0.445
0.109
UNIT LOAD
COMPONENTS
FOR LEGS
UNIT LOAD COMPONENTS
FOR DIAGONALS
0.10
1.197
1.234
2.553
0.63
1.080
1.319
2.404
DIAGONAL
LOAD
COMPONENTS
2.141
0.35
0.89
1.341
2.738
1.397
1.207
1.061
4.56
0.555
0.080
5.01
0.635
0.555
0.635
0.987
LEG LOAD
COMPONENTS
1.429
3.55
6.23
0.432
0.362
0.794
0.432
0.794
4.46
2.47
5.64
SUMMATION
1.42
3.57
3.20
7.12
2.38



STRAINS MEASURED BY 'D' GAGES



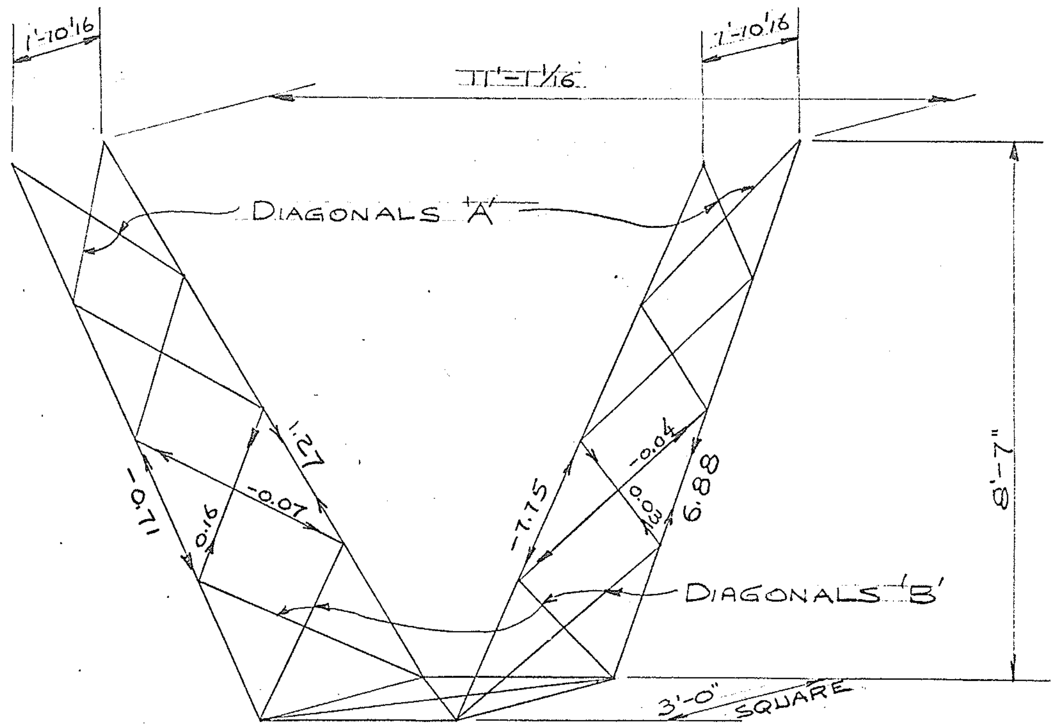
LOAD COMPONENTS



SUMMATION

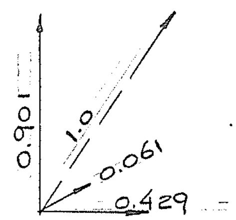
STRAINS MEASURED BY 'C' GAGES

LONGITUDINAL OUTSIDE FACES OF SUPPORT ARMS

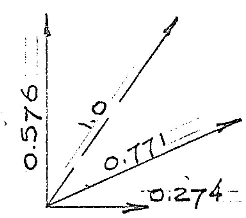


NORTH FACE

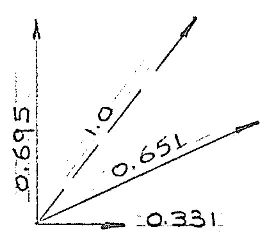
UNIT LOAD COMPONENTS
FOR LEGS



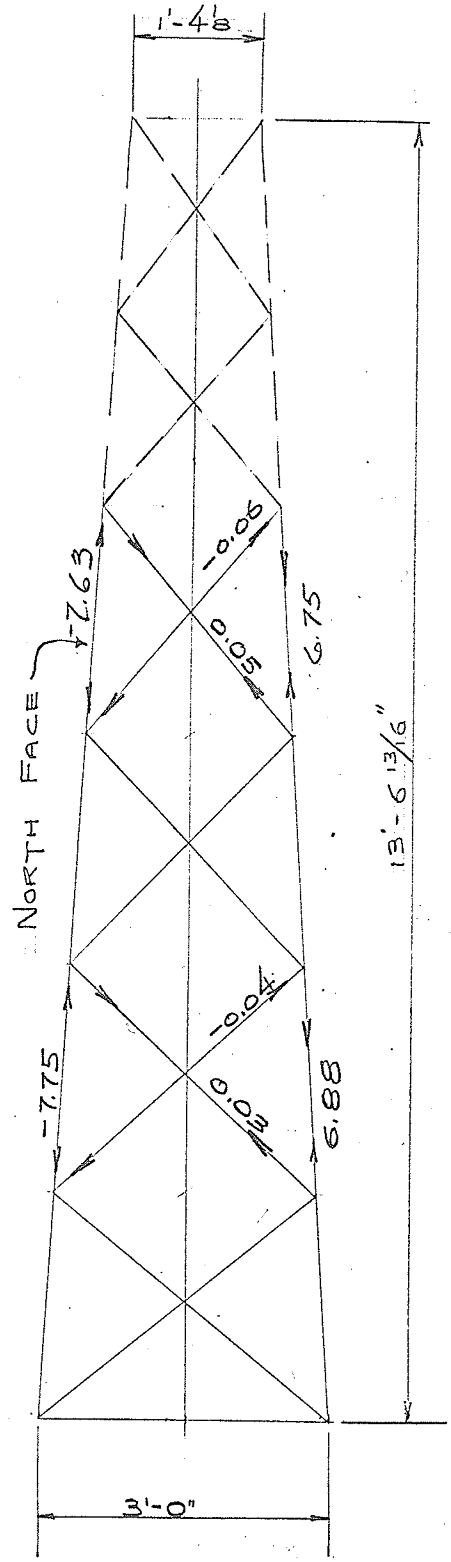
UNIT LOAD COMPONENTS
FOR BOTTOM (B) DIAGONALS

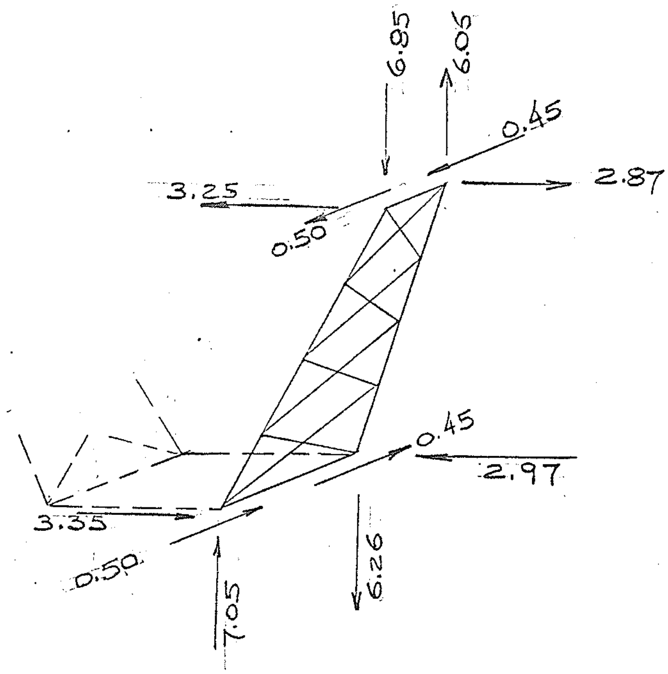


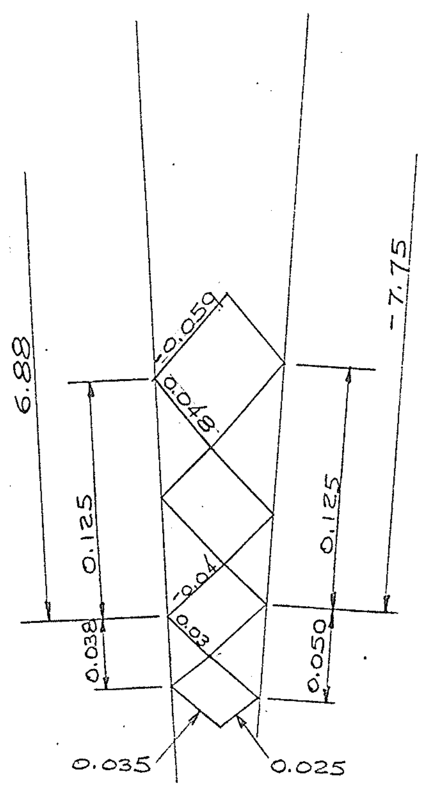
UNIT LOAD COMPONENTS
FOR TOP (A) DIAGONALS



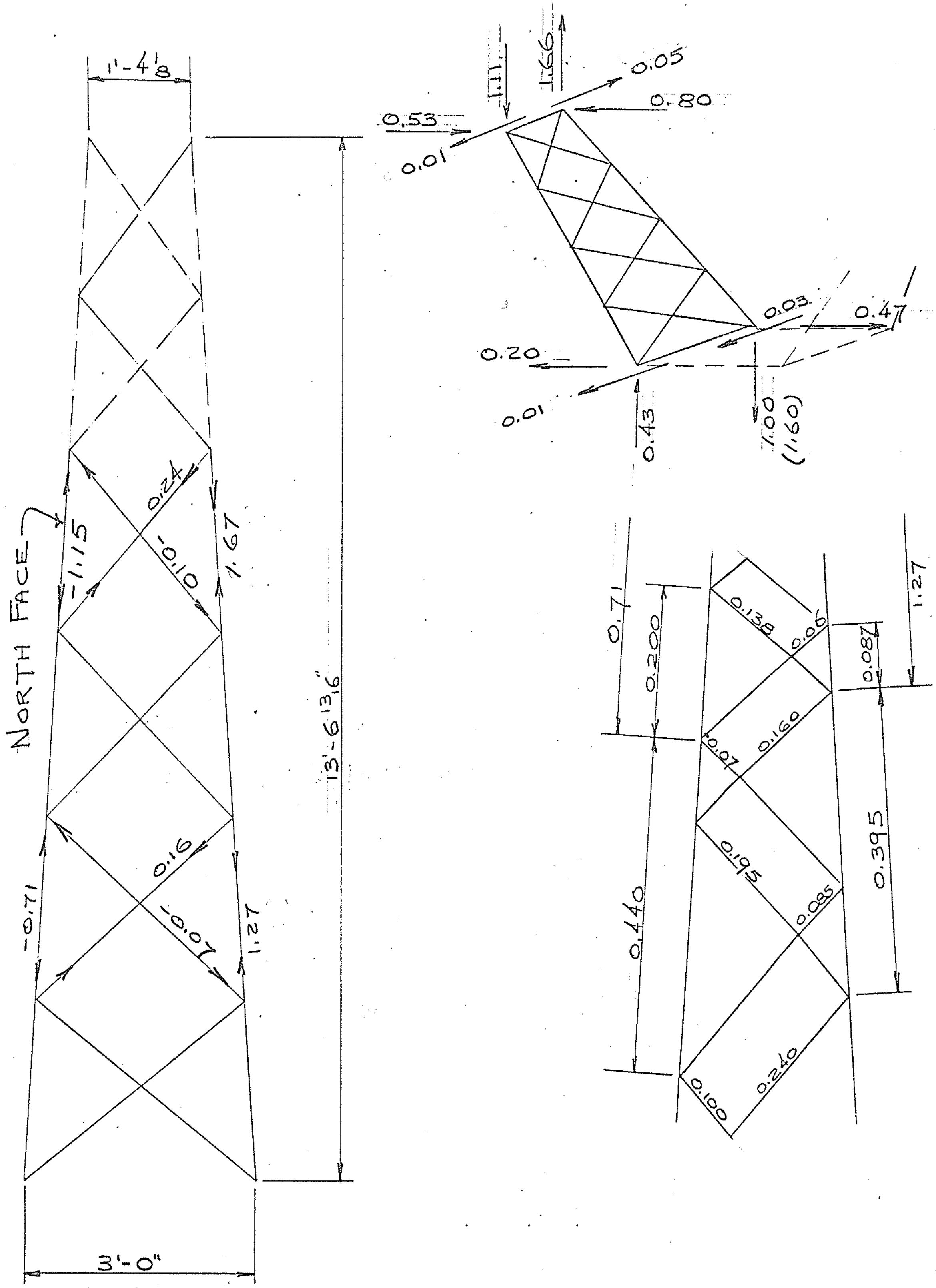
WEST SUPPORT ARM
LONGITUDINAL OUTSIDE FACE





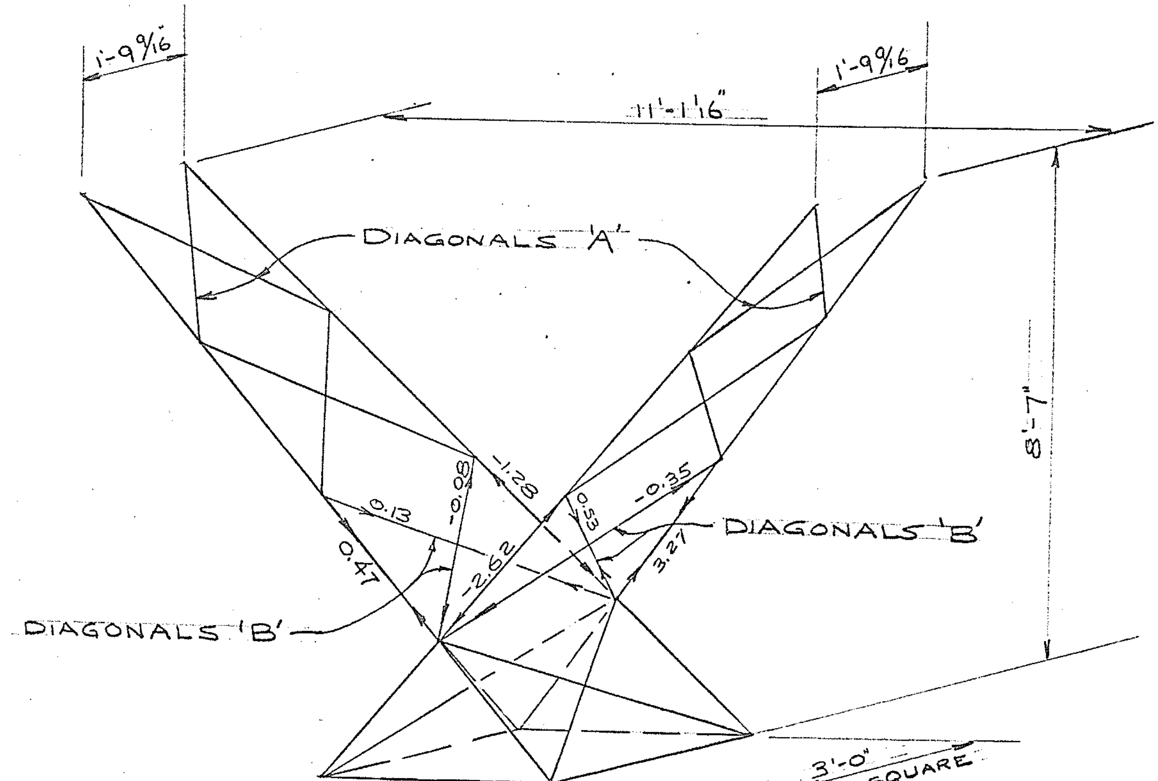


EAST SUPPORT ARM
LONGITUDINAL OUTSIDE FACE

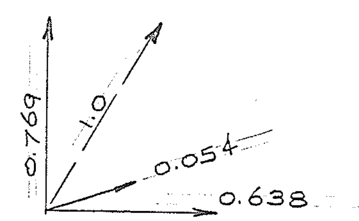


STRAINS MEASURED BY 'C' GAGES

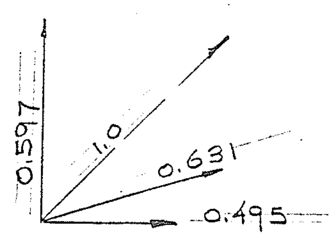
LONGITUDINAL INSIDE FACES OF SUPPORT ARMS



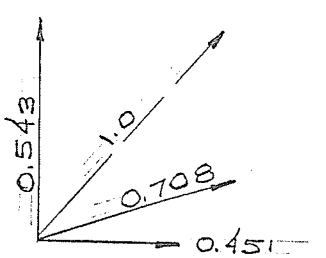
UNIT LOAD COMPONENTS FOR LEGS



UNIT LOAD COMPONENTS FOR UPPER (A) DIAGONALS

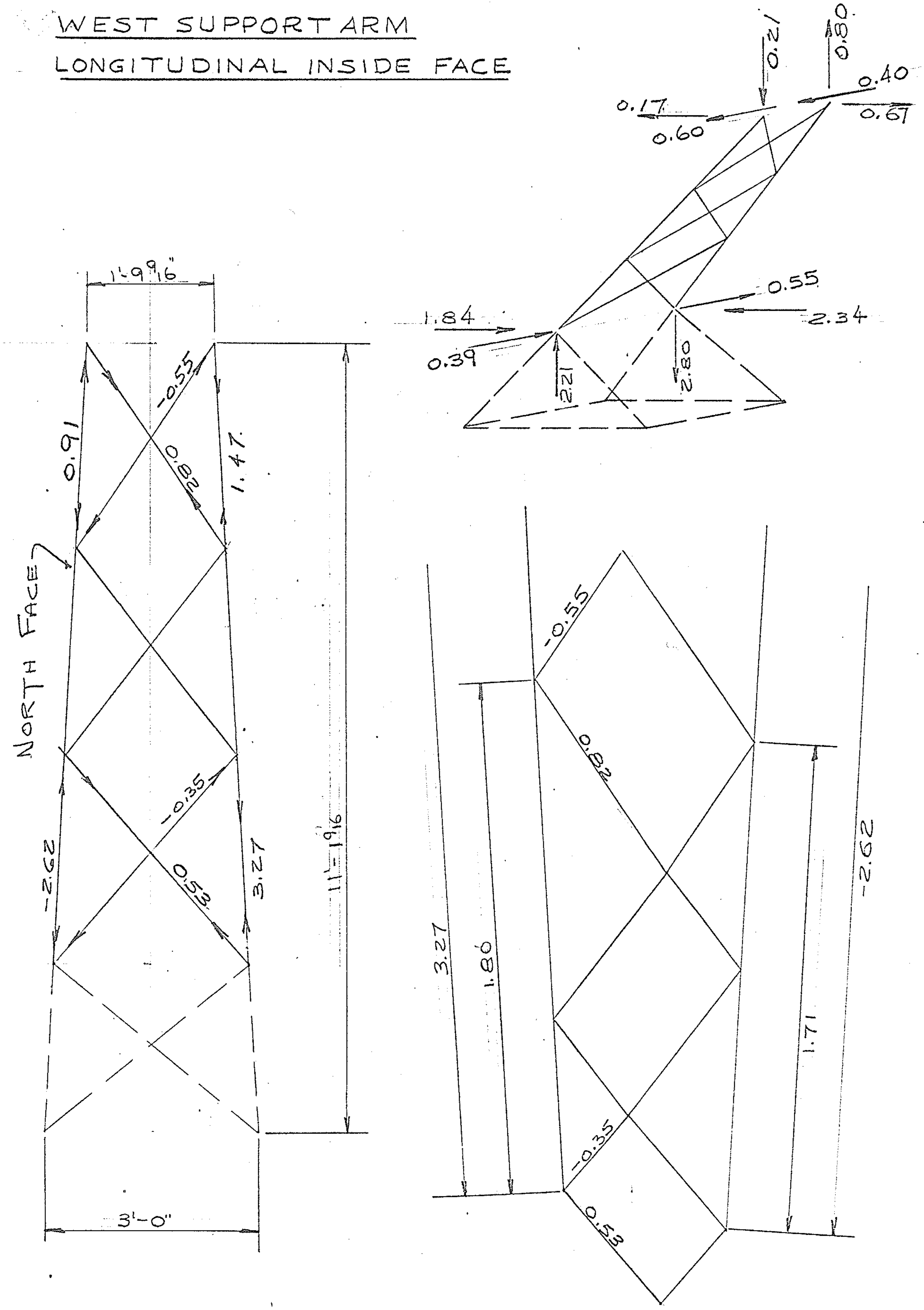


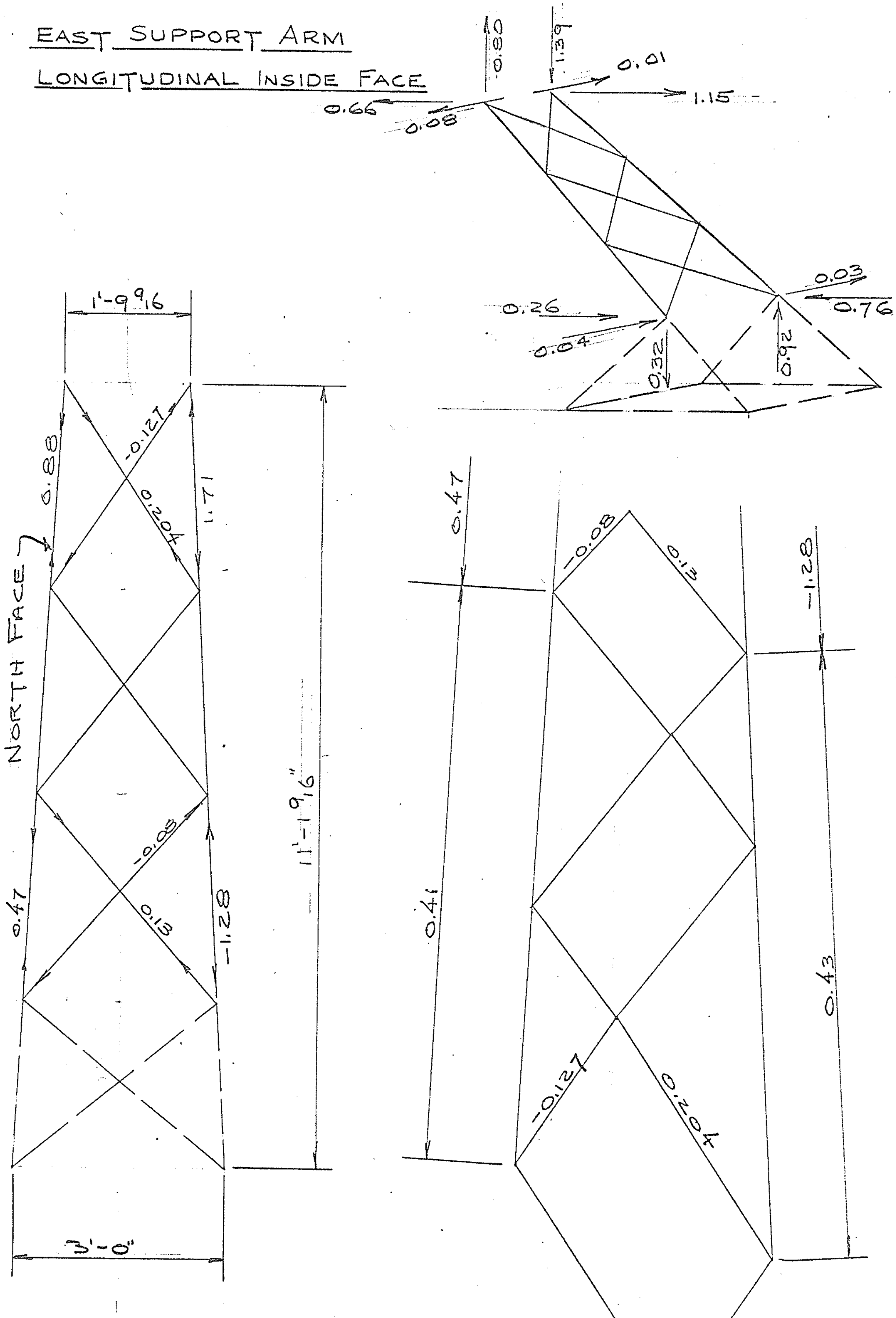
UNIT LOAD COMPONENTS FOR LOWER (B) DIAGONALS



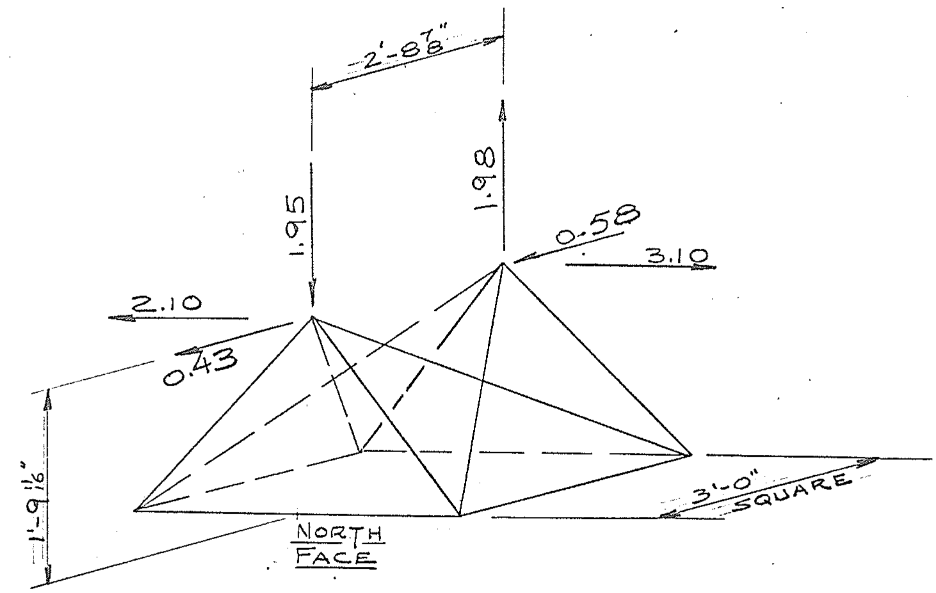
WEST SUPPORT ARM

LONGITUDINAL INSIDE FACE

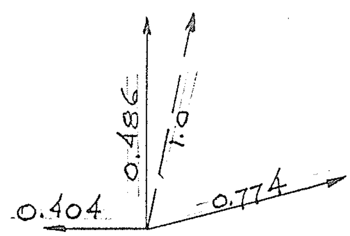



EAST SUPPORT ARM
LONGITUDINAL INSIDE FACE
0.80
1.39
0.01
1.15
0.66
0.08
0.03
0.76
0.26
0.04
0.32
0.92
1'-9 9/16
0.88
-0.127
0.204
1.71
NORTH FACE
-0.08
0.13
0.47
-1.28
11'-1 9/16"
3'-0"
0.47
-0.08
0.13
-1.28
0.41
0.43
-0.127
0.204

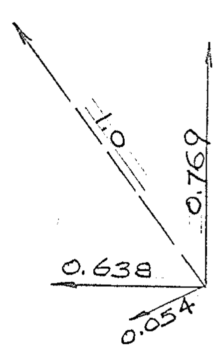
STRAINS MEASURED BY 'C' GAGES
SUMMARY OF LOADS AT INTERSECTION
OF INSIDE LONGITUDINAL SUPPORT ARM FACES



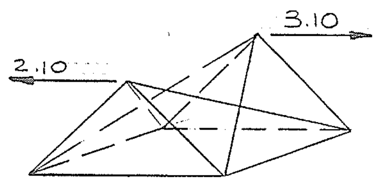
UNIT LOAD COMPONENTS
FOR DIAGONALS

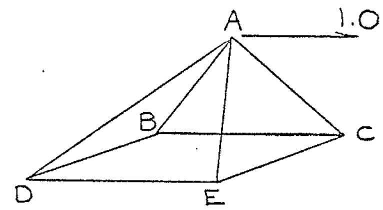


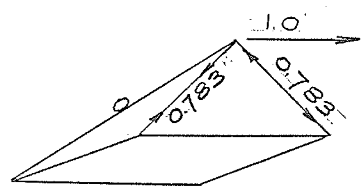
UNIT LOAD COMPONENTS
FOR LEGS

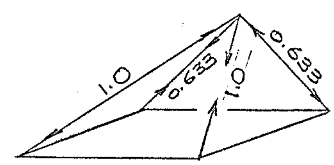


ANALYSIS OF INDETERMINATE FRAME AT WAIST LEVEL FOR MEMBER LOADS DUE TO UNIT APPLIED TRANSVERSE LOAD







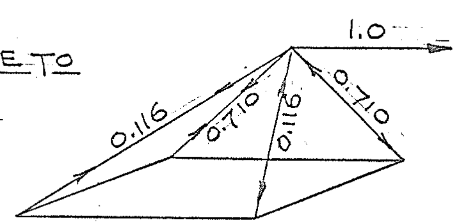


MEMB.	DESCRIPTION	A IN.²	L IN.	S' KIPS	u	$\frac{S'uL}{A}$	$\frac{u^2L}{A}$	$X_r u$	S KIPS
AB	$1\frac{3}{4} \times 1\frac{3}{4} \times \frac{3}{16}$	0.62	28.2	0.783	0.633	22.6	18.2	-0.0735	0.710
AC	$1\frac{3}{4} \times 1\frac{3}{4} \times \frac{3}{16}$	0.62	28.2	-0.783	-0.633	22.6	18.2	0.0735	-0.710
AE	$1 \times 1 \times \frac{1}{8}$	0.23	40.6	0	1.0	0	176.5	-0.116	-0.116
AD	$1 \times 1 \times \frac{1}{8}$	0.23	40.6	0	-1.0	0	176.5	0.116	0.116
Σ						45.2	389.4		

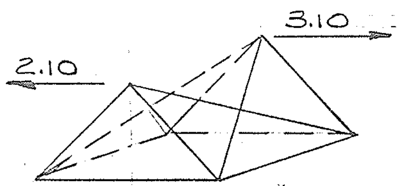
NOTE: + DESIGNATES TENSION

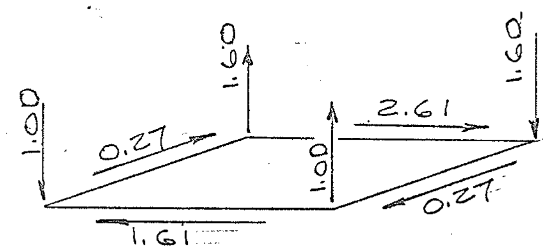
$$X_r = -\frac{45.2}{389.4} = -0.116$$

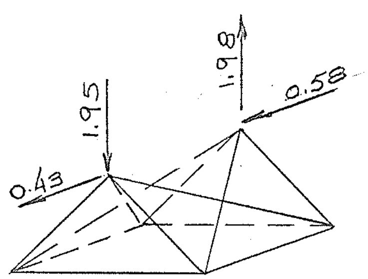
MEMBER LOADS DUE TO APPLIED UNIT LOAD

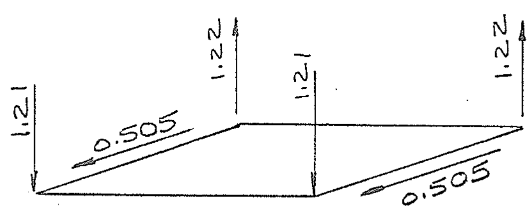


INTERSECTION OF INSIDE LONGITUDINAL SUPPORT ARM FACES

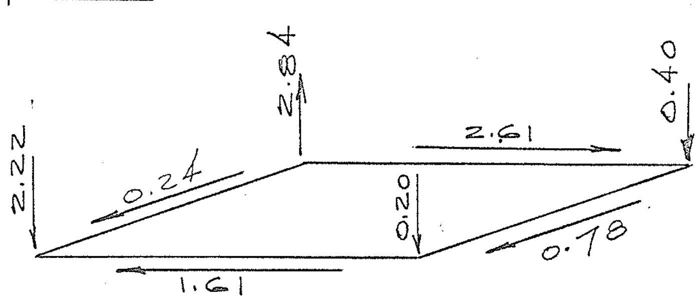


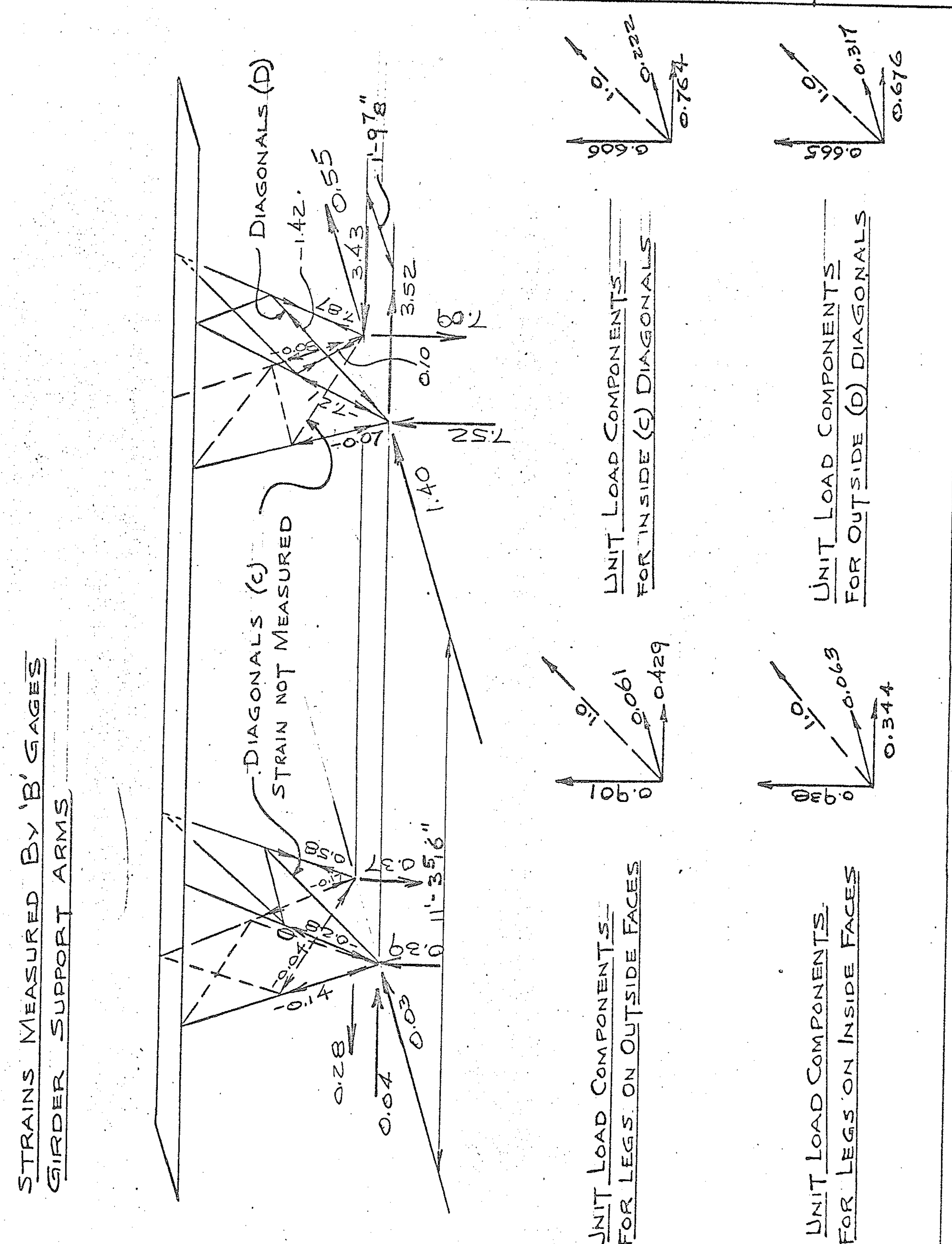


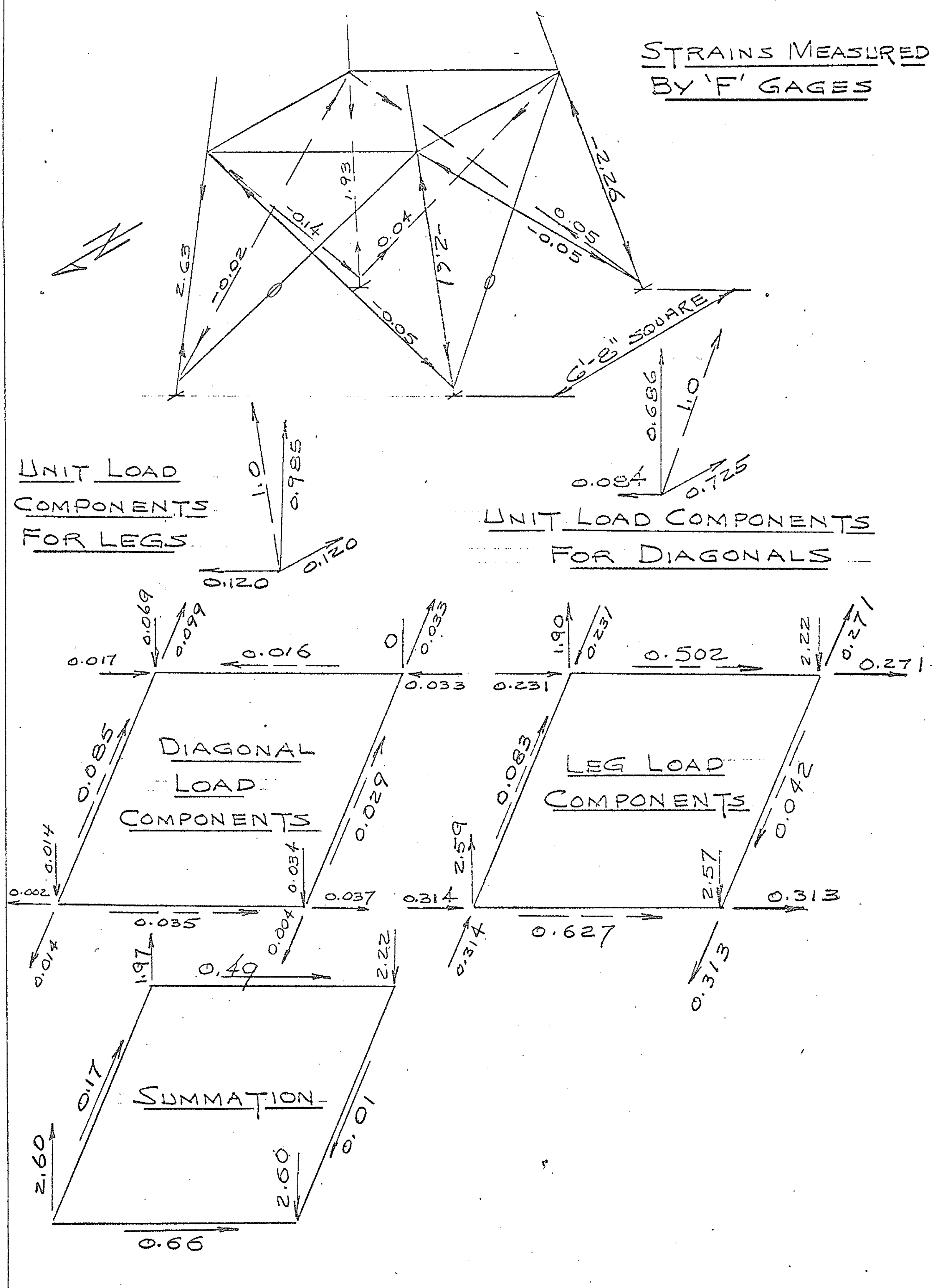


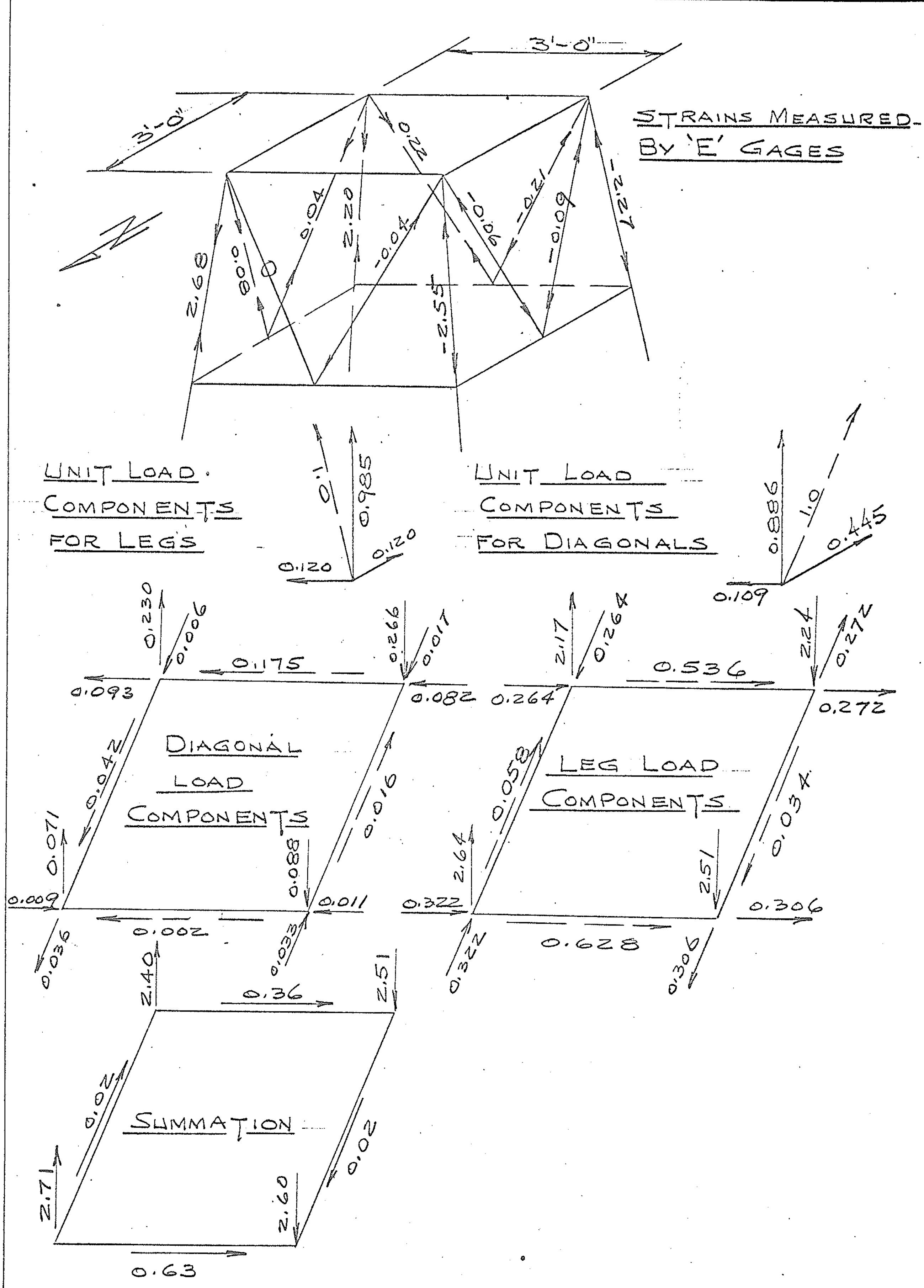


SUMMATION OF LOADS AT WAIST FROM LONGITUDINAL INSIDE FACES OF SUPPORT ARMS

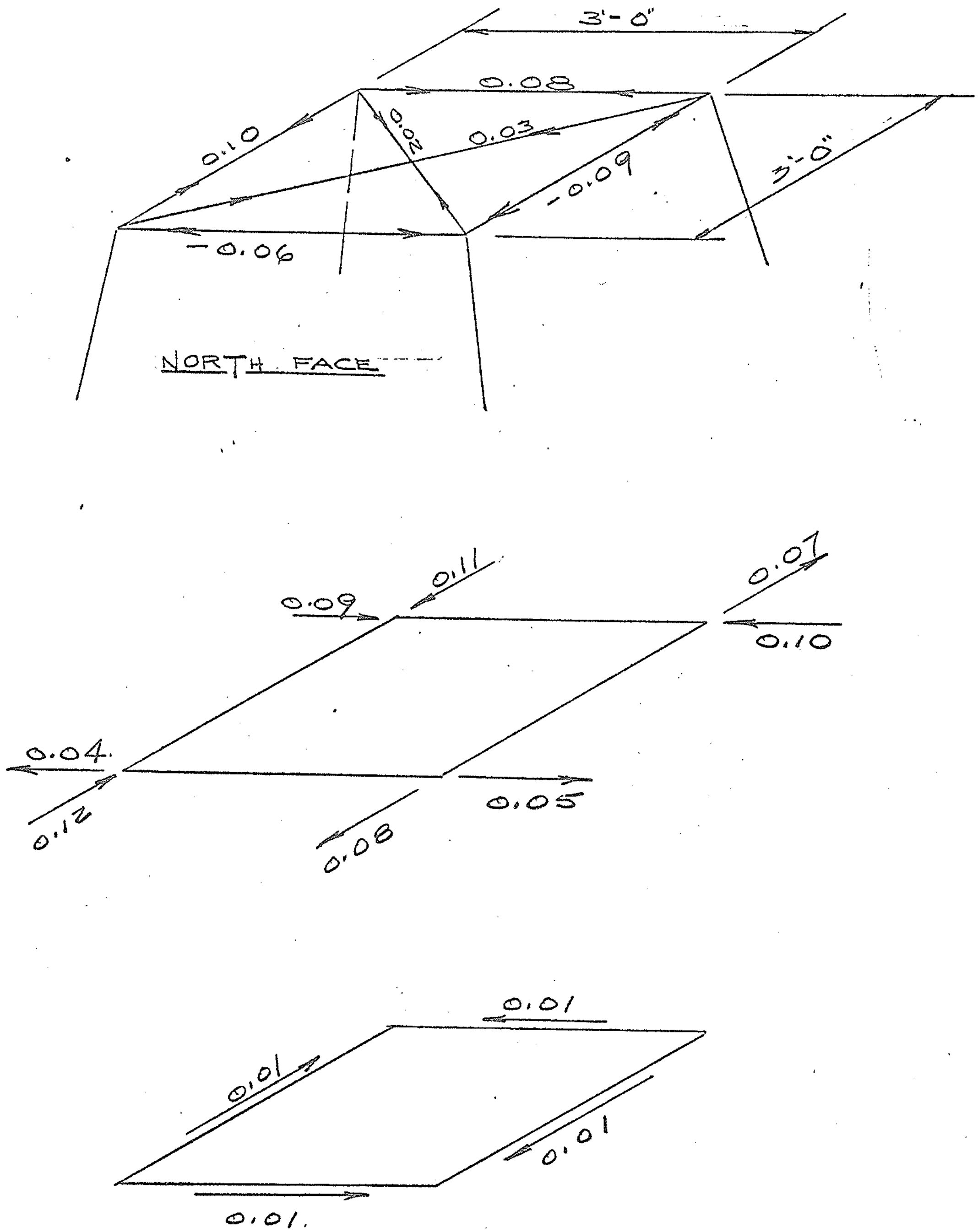



STRAINS MEASURED BY 'B' GAGES
GIRDER SUPPORT ARMS
DIAGONALS (D)
DIAGONALS (C)
STRAIN NOT MEASURED
UNIT LOAD COMPONENTS
FOR INSIDE (C) DIAGONALS
UNIT LOAD COMPONENTS
FOR OUTSIDE (D) DIAGONALS
UNIT LOAD COMPONENTS
FOR LEGS ON OUTSIDE FACES
UNIT LOAD COMPONENTS
FOR LEGS ON INSIDE FACES
1-9 7/8"
11'-3 5/16"
-1.42
0.55
3.43
3.52
7.09
0.10
7.52
-0.07
1.40
0.28
0.04
0.03
-0.14
0.37
0.58
0.39
1.0
0.222
0.764
0.606
0.317
0.676
0.665
0.061
0.429
0.901
0.063
0.344
0.938

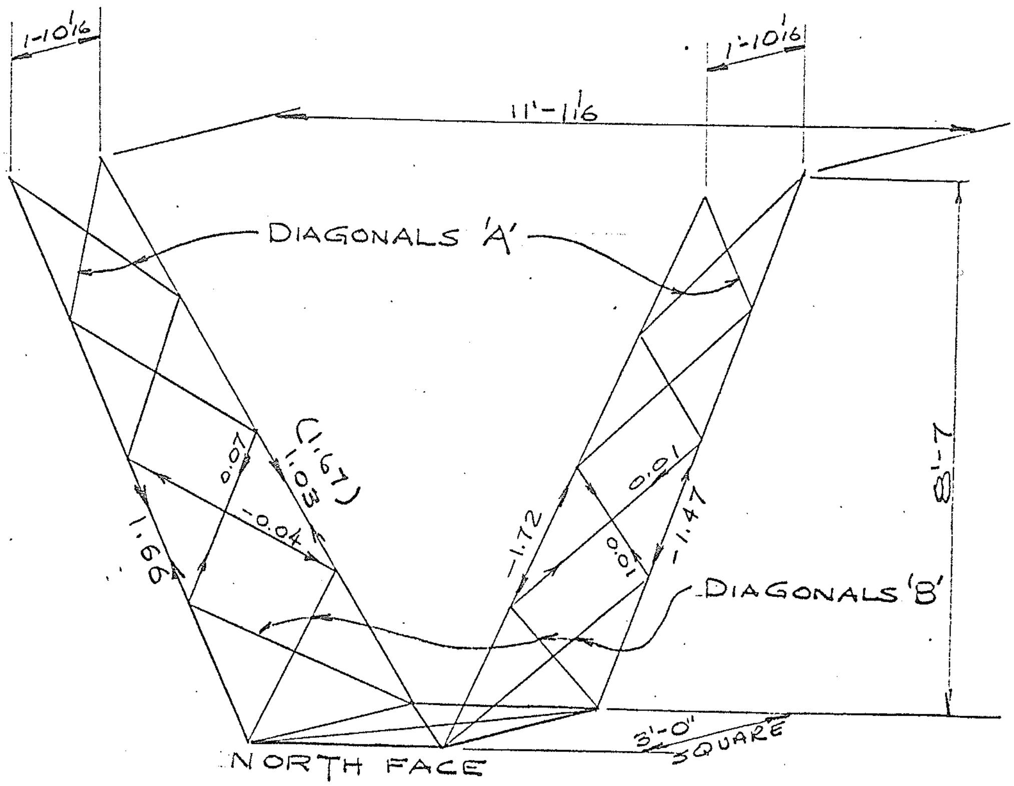

STRAINS MEASURED BY 'F' GAGES
-2.26
1.93
2.63
-0.02
0
-0.14
0.04
-1.91
0
0.05
-0.05
-0.05
6'-8" SQUARE
UNIT LOAD COMPONENTS FOR LEGS
1.0
0.985
0.120
0.120
0.686
1.0
0.084
0.725
UNIT LOAD COMPONENTS FOR DIAGONALS
DIAGONAL LOAD COMPONENTS
0.069
0.099
0.017
0.016
0
0.033
0.033
0.085
0.029
0.014
0.002
0.034
0.037
0.035
0.014
0.004
LEG LOAD COMPONENTS
1.90
0.231
0.231
0.502
2.22
0.271
0.271
0.083
0.042
2.59
0.314
2.57
0.313
0.627
0.314
0.313
SUMMATION
1.97
0.49
2.22
0.17
0.01
2.60
2.60
0.66


3'-0"
3'-0"
STRAINS MEASURED BY 'E' GAGES
2.68
0.08
0.04
2.20
0.22
-0.04
-2.55
-0.06
-0.21
-0.09
-2.21
UNIT LOAD COMPONENTS FOR LEGS
0.1
0.985
0.120
0.120
UNIT LOAD COMPONENTS FOR DIAGONALS
0.886
1.0
0.445
0.109
0.230
0.006
0.175
0.266
0.017
0.093
0.082
DIAGONAL LOAD COMPONENTS
0.042
0.016
0.071
0.088
0.009
0.011
0.002
0.036
0.033
2.17
0.264
0.536
2.24
0.272
0.264
0.272
LEG LOAD COMPONENTS
0.058
0.034
2.64
2.51
0.322
0.306
0.628
0.322
0.306
2.40
0.36
2.51
SUMMATION
0.02
0.02
2.71
2.60
0.63

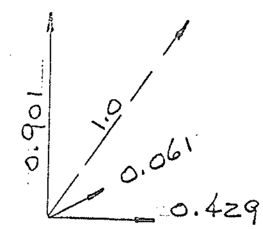
STRAINS MEASURED BY 'D' GAGES



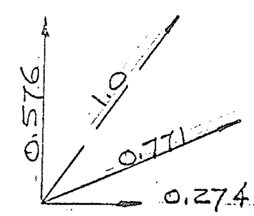
STRAINS MEASURED BY 'C' GAGES
LONGITUDINAL OUTSIDE FACES OF SUPPORT ARMS



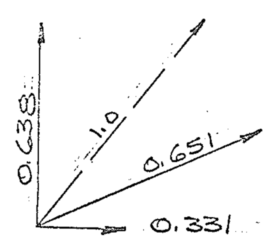
UNIT LOAD COMPONENTS FOR LEGS



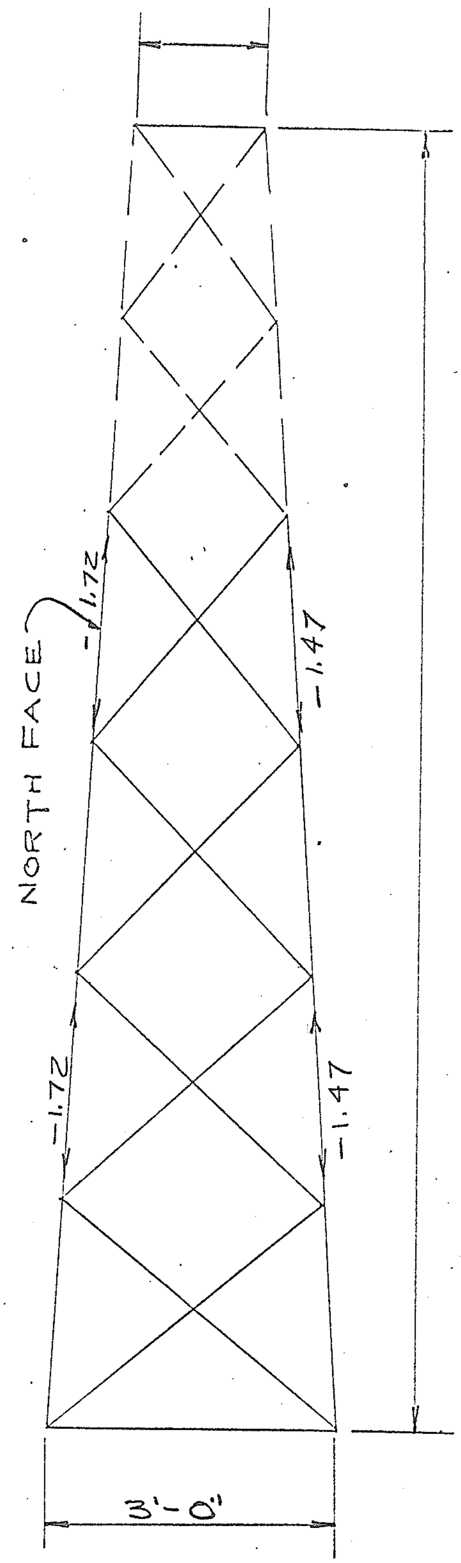
UNIT LOAD COMPONENTS FOR BOTTOM (B) DIAGONALS

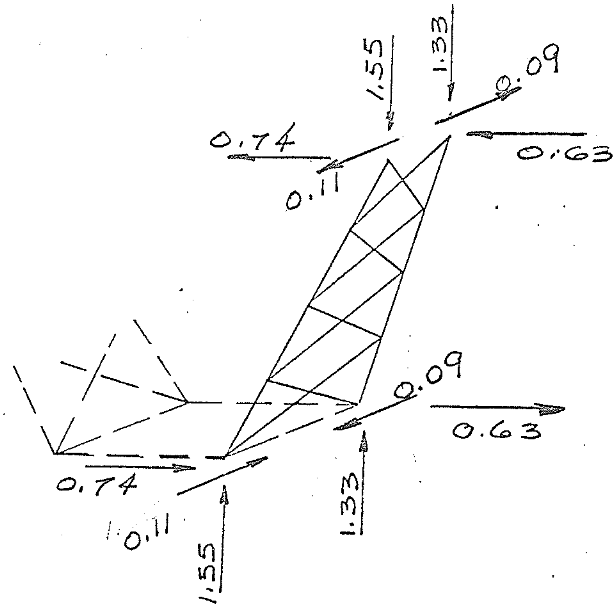


UNIT LOAD COMPONENTS FOR TOP (A) DIAGONALS



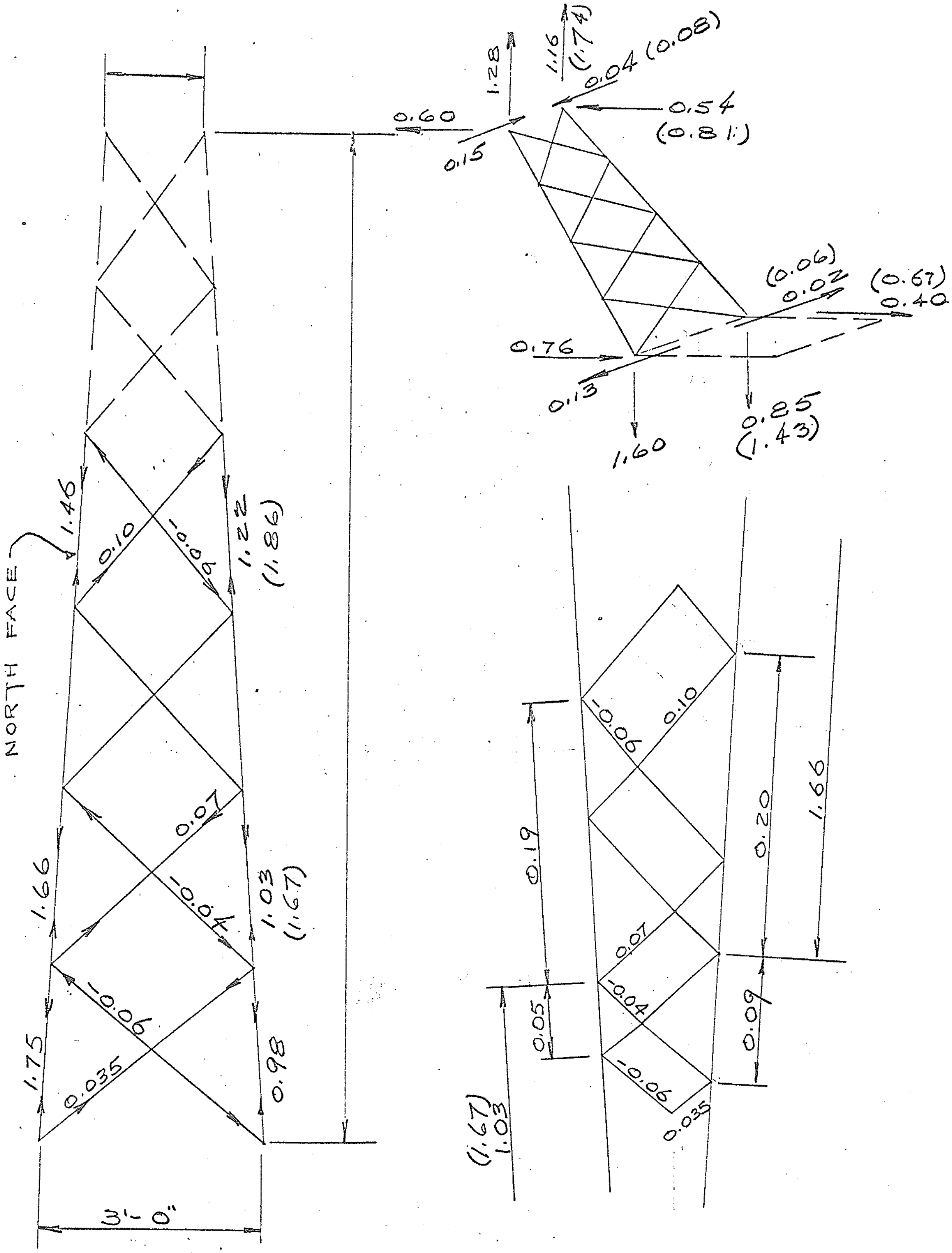
WEST SUPPORT ARM
LONGITUDINAL OUTSIDE FACE



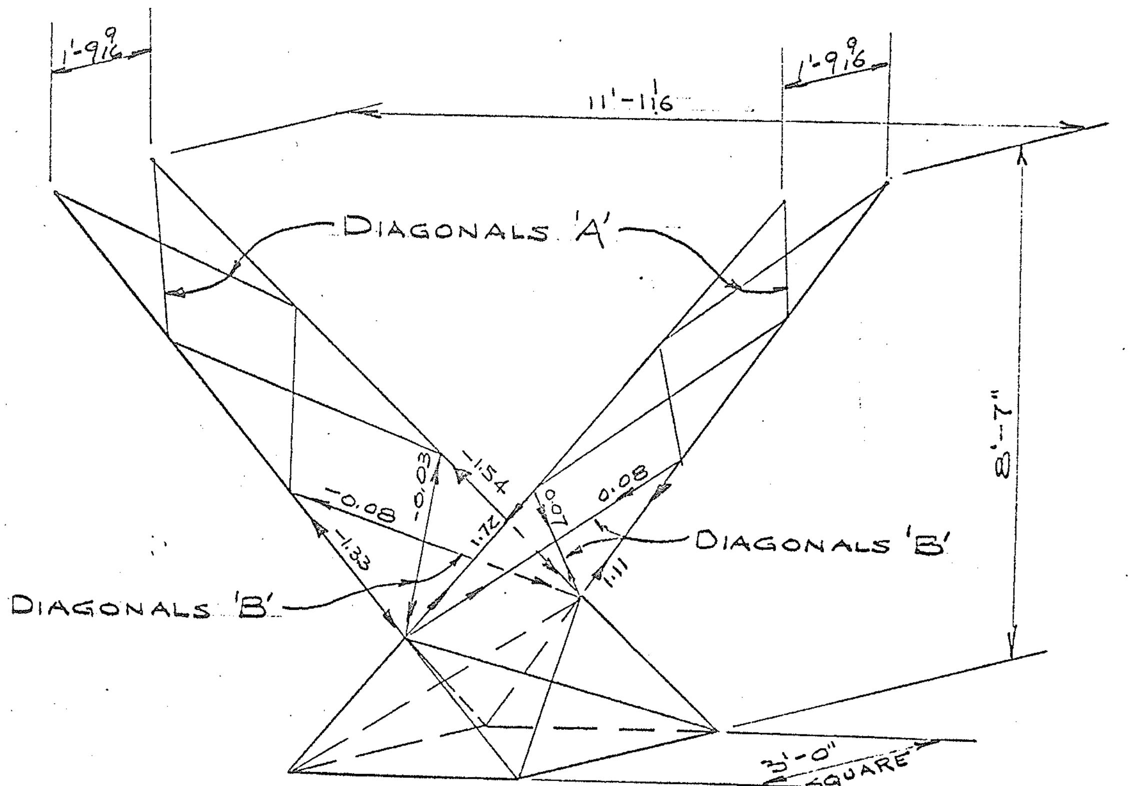


NEGLECT DIAGONAL STRESSES
DUE TO SMALL MAGNITUDE

EAST SUPPORT ARM
LONGITUDINAL OUTSIDE FACE

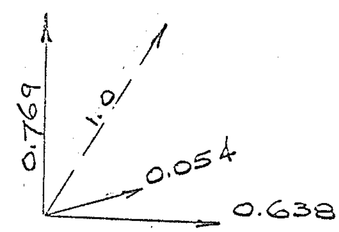


STRAINS MEASURED BY 'C' GAGES
LONGITUDINAL INSIDE FACES OF SUPPORT ARMS

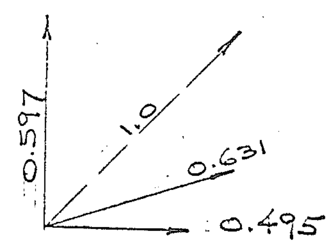


NORTH FACE

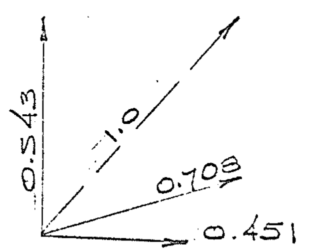
UNIT LOAD COMPONENTS
FOR LEGS



UNIT LOAD COMPONENTS
FOR UPPER (A) DIAGONALS

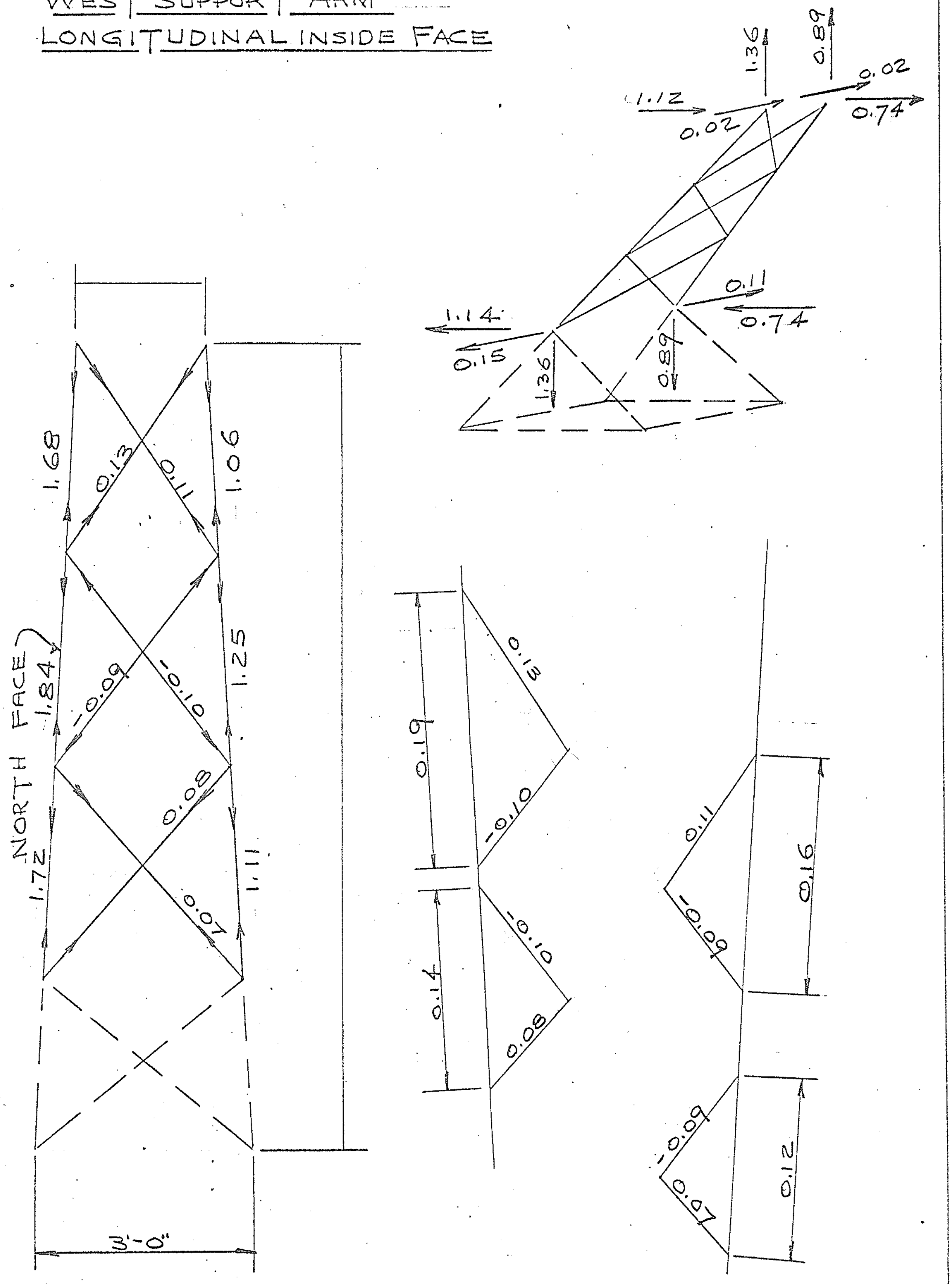


UNIT LOAD COMPONENTS
FOR LOWER (B) DIAGONALS



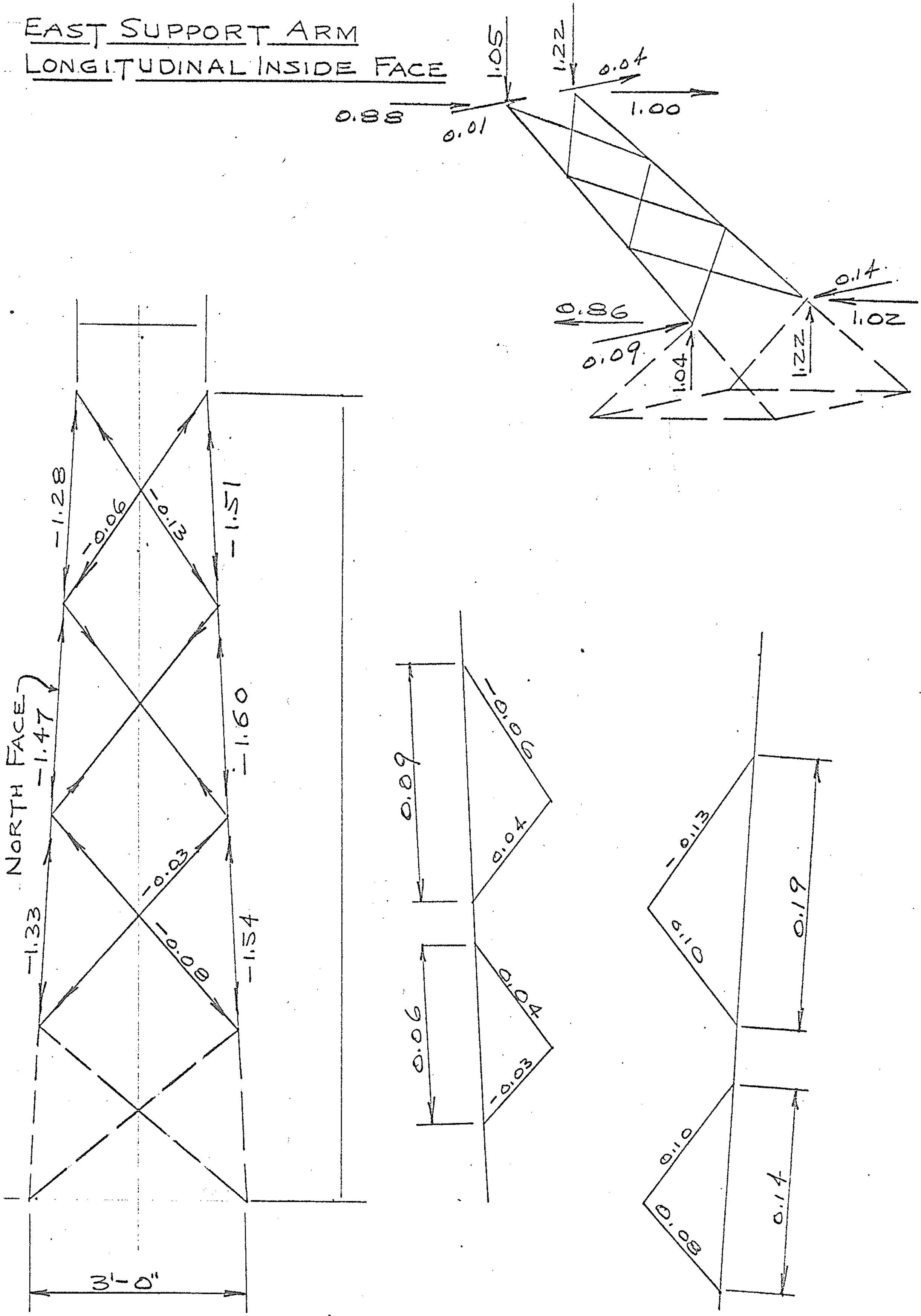
WEST SUPPORT ARM

LONGITUDINAL INSIDE FACE

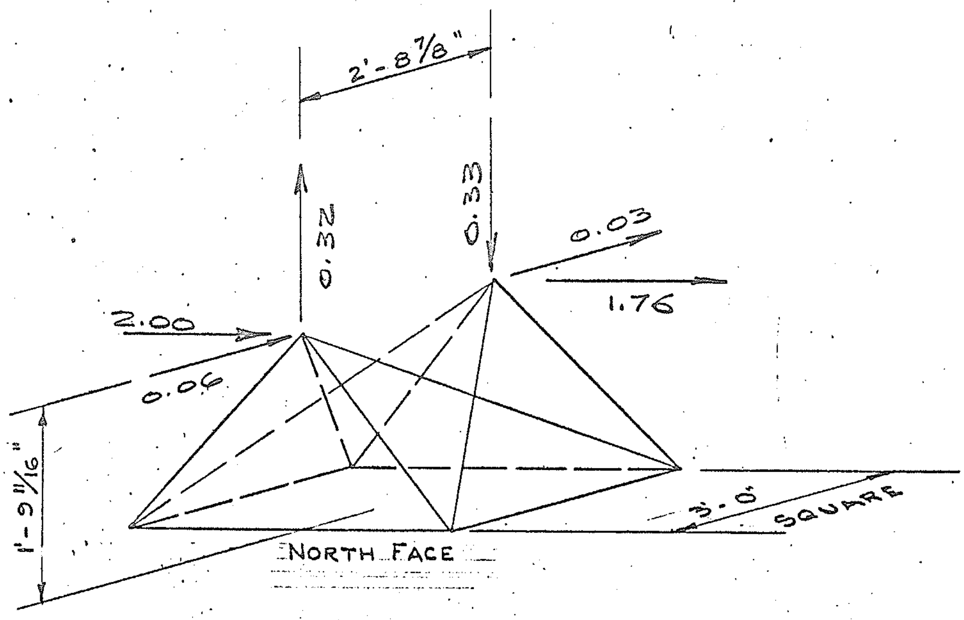


EAST SUPPORT ARM

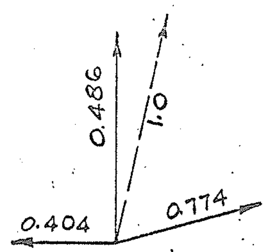
LONGITUDINAL INSIDE FACE



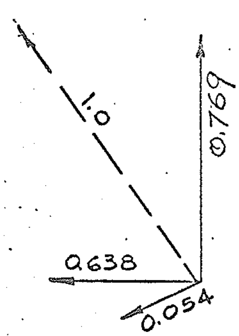
STRAINS MEASURED BY 'C' GAGES
SUMMARY OF LOADS AT INTERSECTION OF
INSIDE LONGITUDINAL SUPPORT ARM FACES



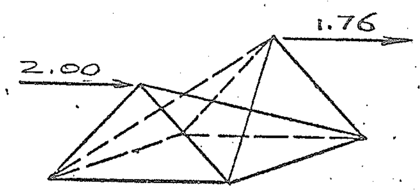
UNIT LOAD COMPONENTS
FOR DIAGONALS

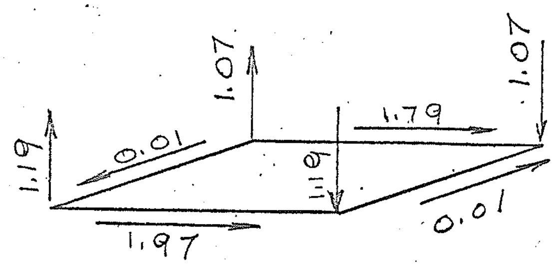


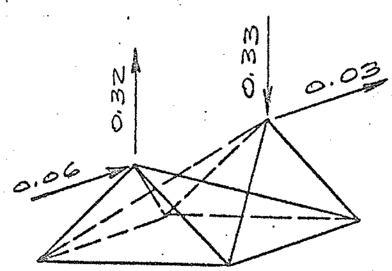
UNIT LOAD COMPONENTS
FOR LEGS

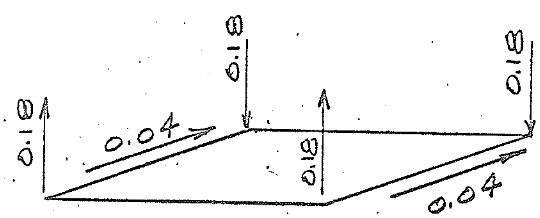


INTERSECTION OF INSIDE LONGITUDINAL SUPPORT ARM FACES

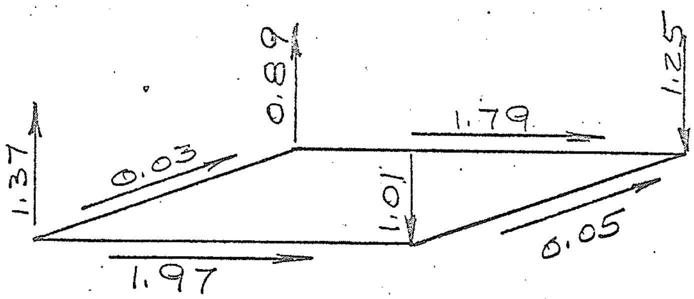


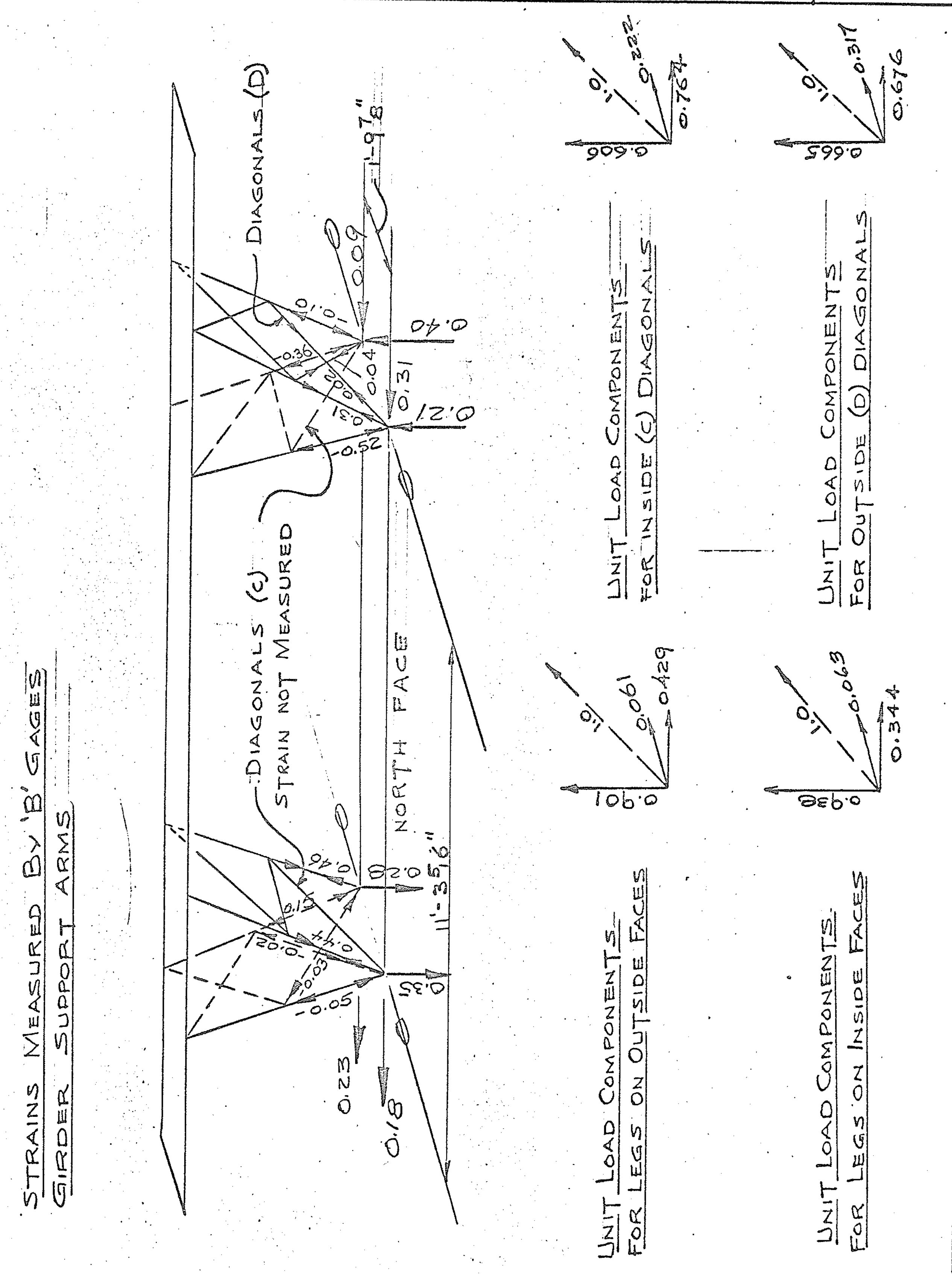


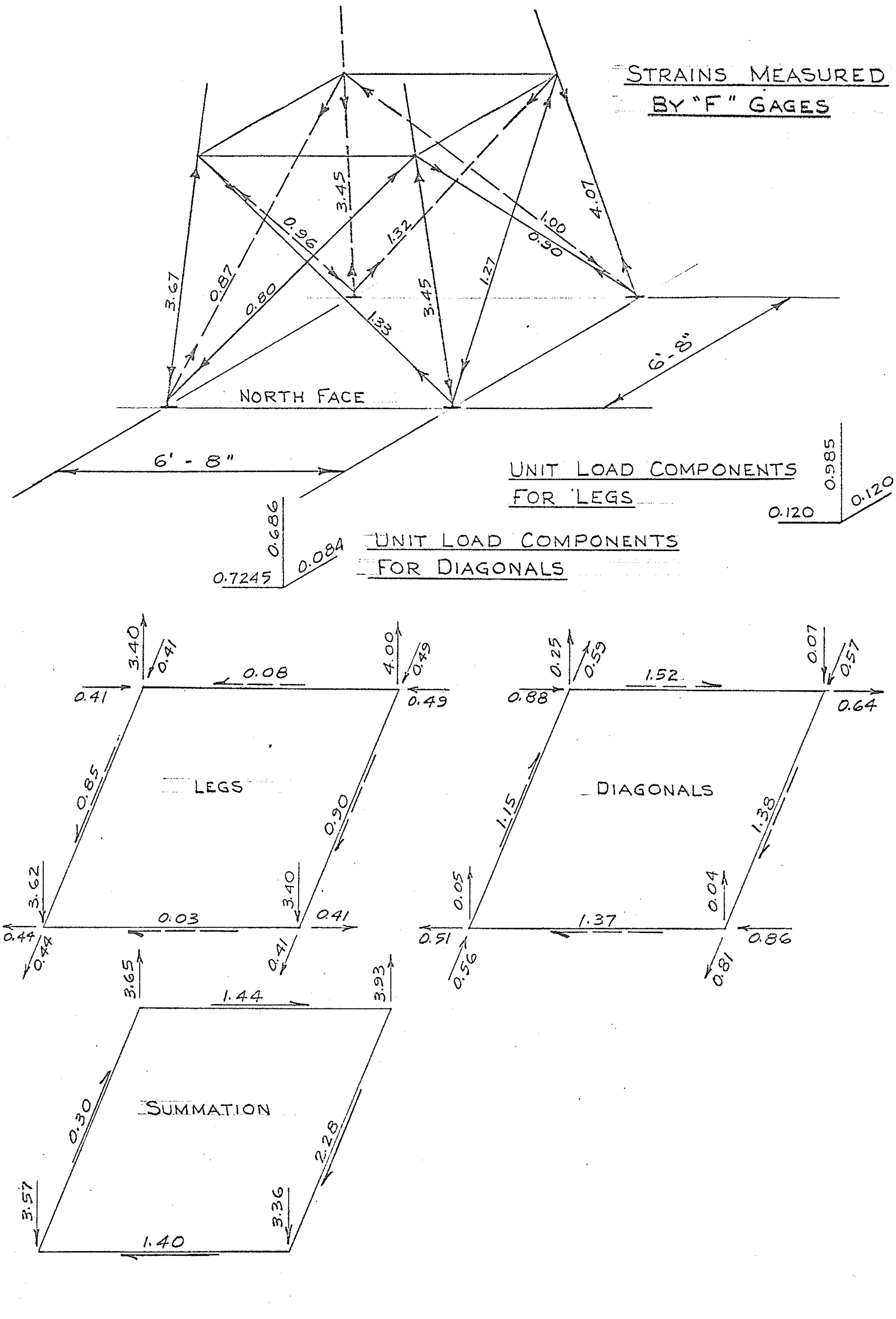


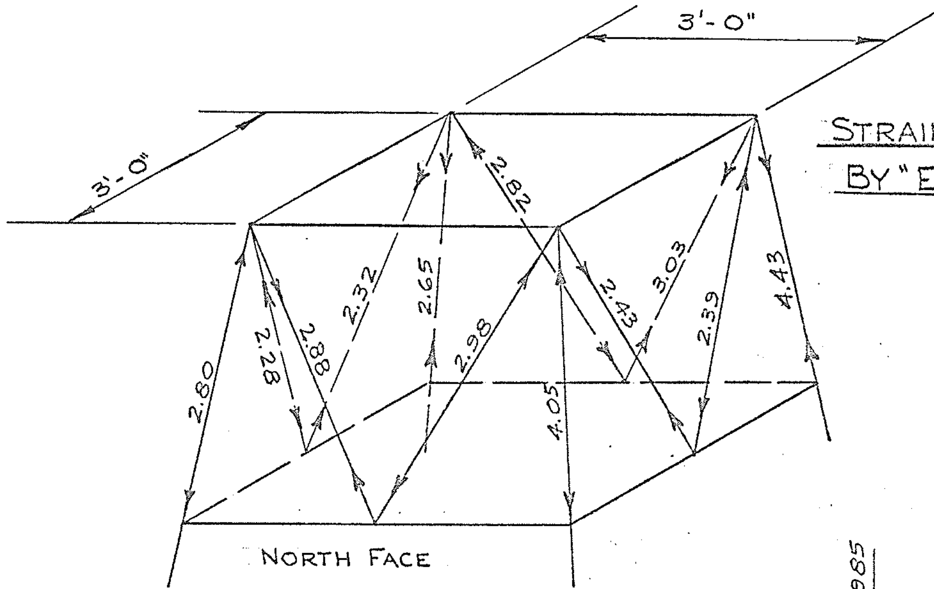


SUMMATION OF LOADS AT WAIST FROM LONGITUDINAL INSIDE FACES OF SUPPORT ARMS

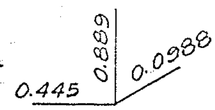



STRAINS MEASURED BY 'B' GAGES
GIRDER SUPPORT ARMS
DIAGONALS (D)
DIAGONALS (C)
STRAIN NOT MEASURED
NORTH FACE
1'-9 7/8"
11'-3 5/16"
0.40
0.10
0.60
0.04
0.36
0.31
0.21
0.52
0.46
0.15
0.44
0.05
0.23
0.18
UNIT LOAD COMPONENTS FOR INSIDE (C) DIAGONALS
1.0
0.222
0.764
0.606
UNIT LOAD COMPONENTS FOR OUTSIDE (D) DIAGONALS
1.0
0.317
0.676
0.665
UNIT LOAD COMPONENTS FOR LEGS ON OUTSIDE FACES
1.0
0.061
0.429
0.901
UNIT LOAD COMPONENTS FOR LEGS ON INSIDE FACES
1.0
0.063
0.344
0.938

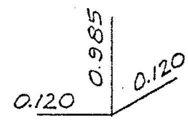

STRAINS MEASURED BY "F" GAGES
3.45
4.07
1.00
0.90
0.96
1.32
3.67
0.87
0.80
3.45
1.27
1.33
6'-8"
NORTH FACE
6' - 8"
UNIT LOAD COMPONENTS FOR LEGS
0.985
0.120
0.120
0.686
0.084
0.7245
UNIT LOAD COMPONENTS FOR DIAGONALS
LEGS
3.40
0.41
0.08
4.00
0.49
0.41
0.49
0.85
0.90
3.62
3.40
0.03
0.41
0.44
0.44
0.41
DIAGONALS
0.25
0.59
1.52
0.07
0.57
0.88
0.64
1.15
1.38
0.05
0.04
1.37
0.51
0.86
0.56
0.81
SUMMATION
3.65
1.44
3.93
0.30
2.28
3.57
3.36
1.40



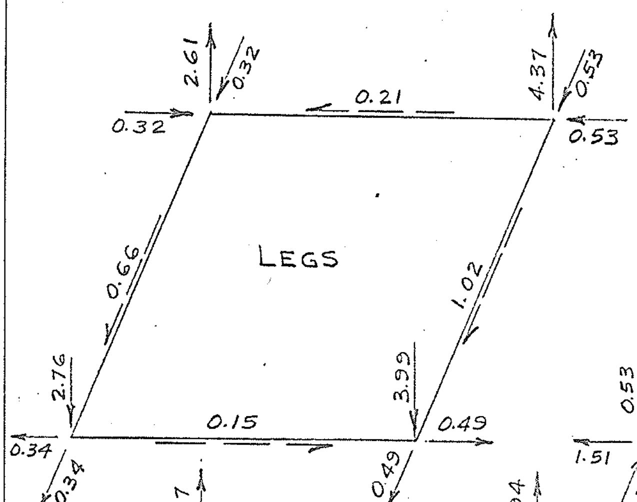
STRAINS MEASURED BY "E" GAGES

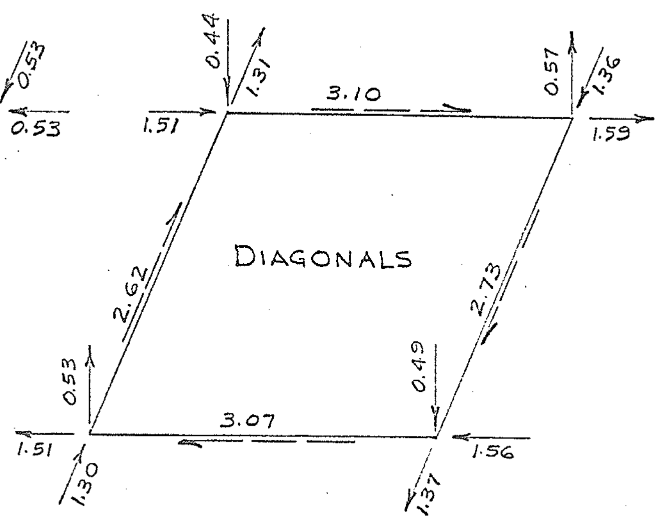


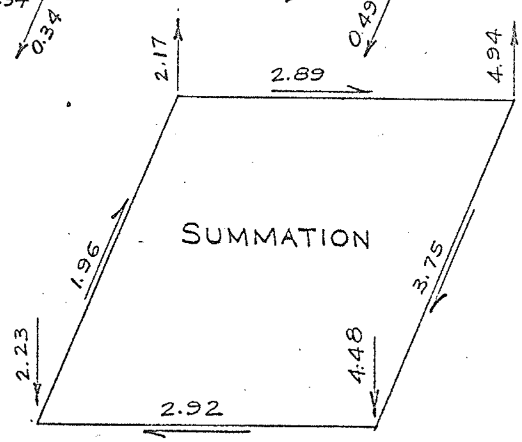
UNIT LOAD COMPONENTS FOR DIAGONALS

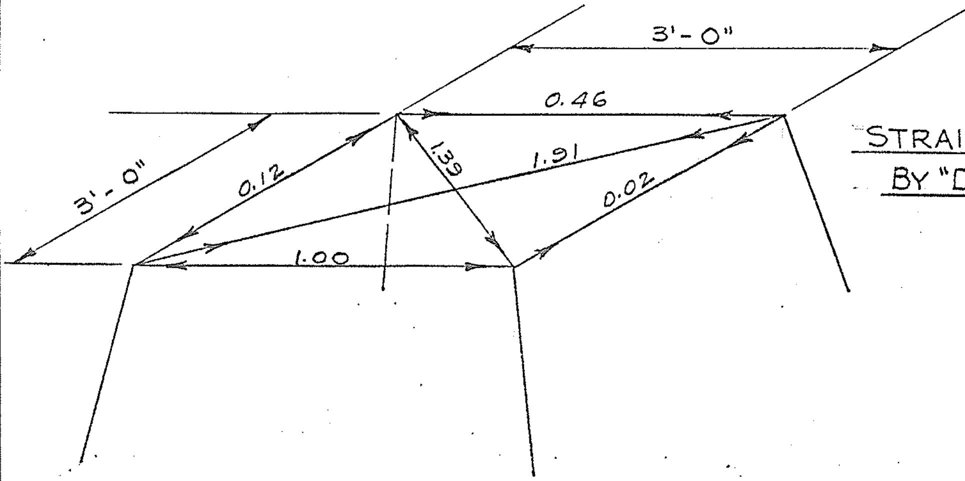


UNIT LOAD COMPONENTS FOR LEGS

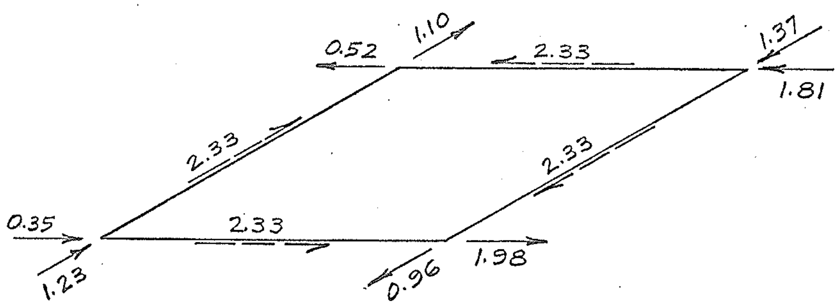


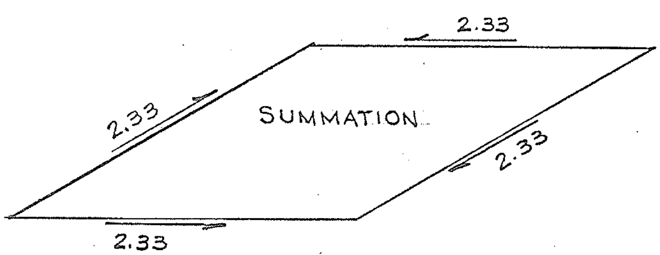




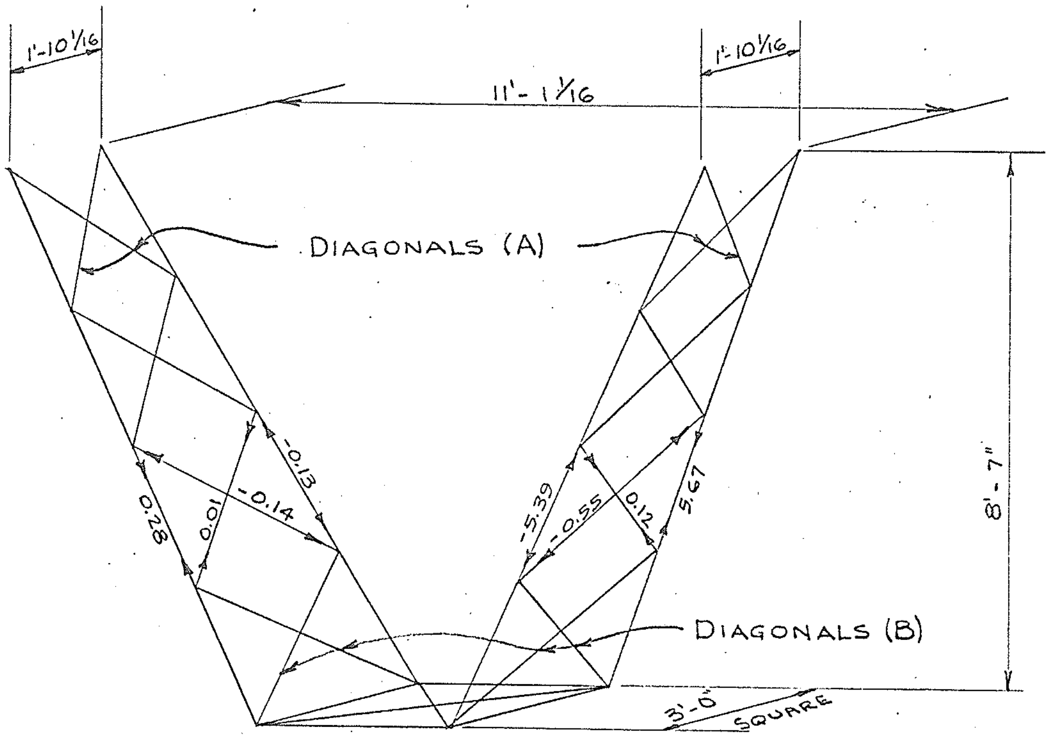


STRAINS MEASURED BY "D" GAGES



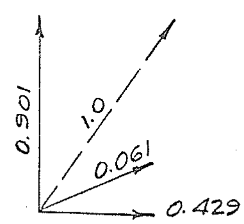


STRAINS MEASURED BY "C" GAGES
LONGITUDINAL OUTSIDE FACES OF SUPPORT ARMS

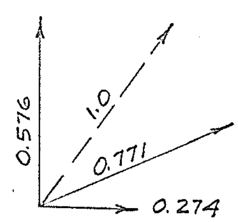


NORTH FACE

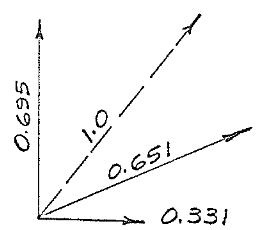
UNIT LOAD COMPONENTS FOR LEGS



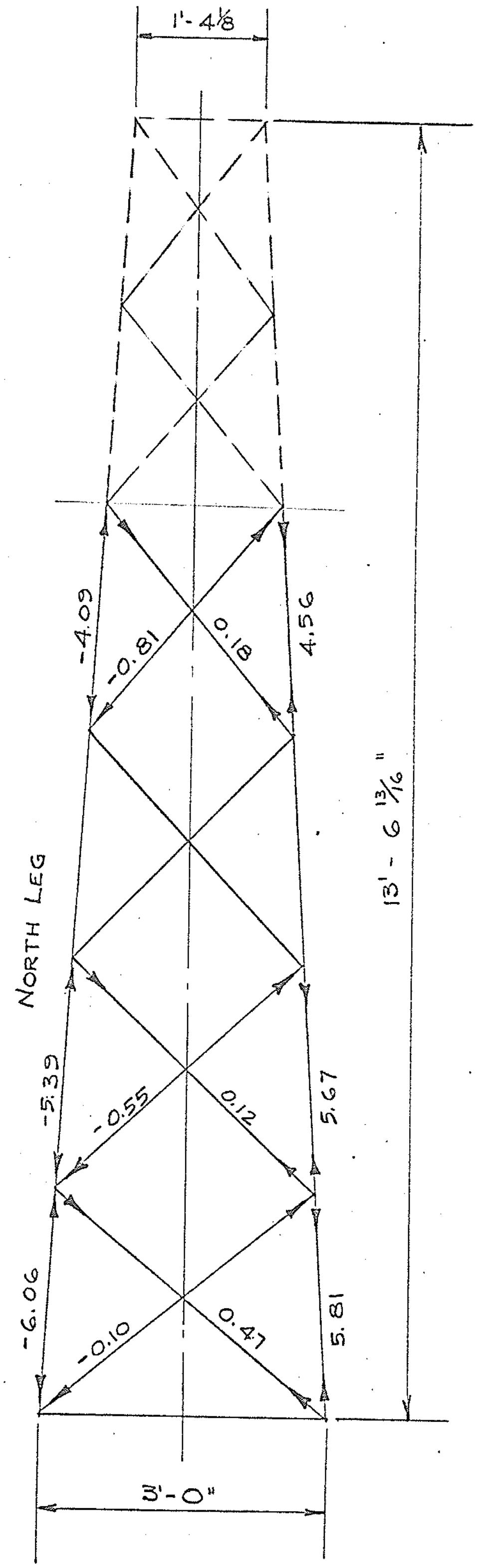
UNIT LOAD COMPONENTS FOR BOTTOM (B) DIAGONALS

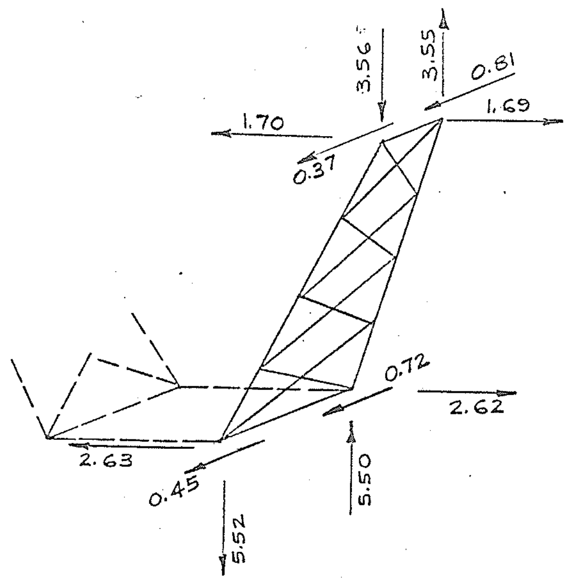


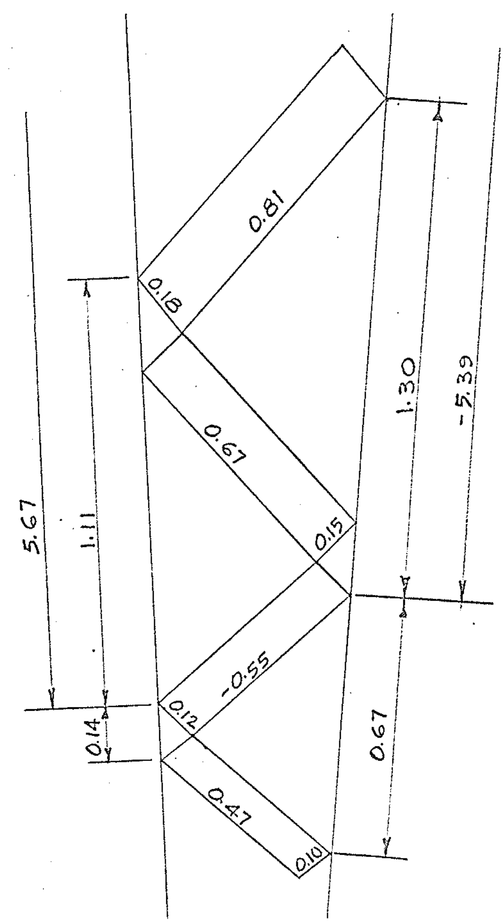
UNIT LOAD COMPONENTS FOR TOP (A) DIAGONALS



WEST SUPPORT ARM
LONGITUDINAL OUTSIDE FACE

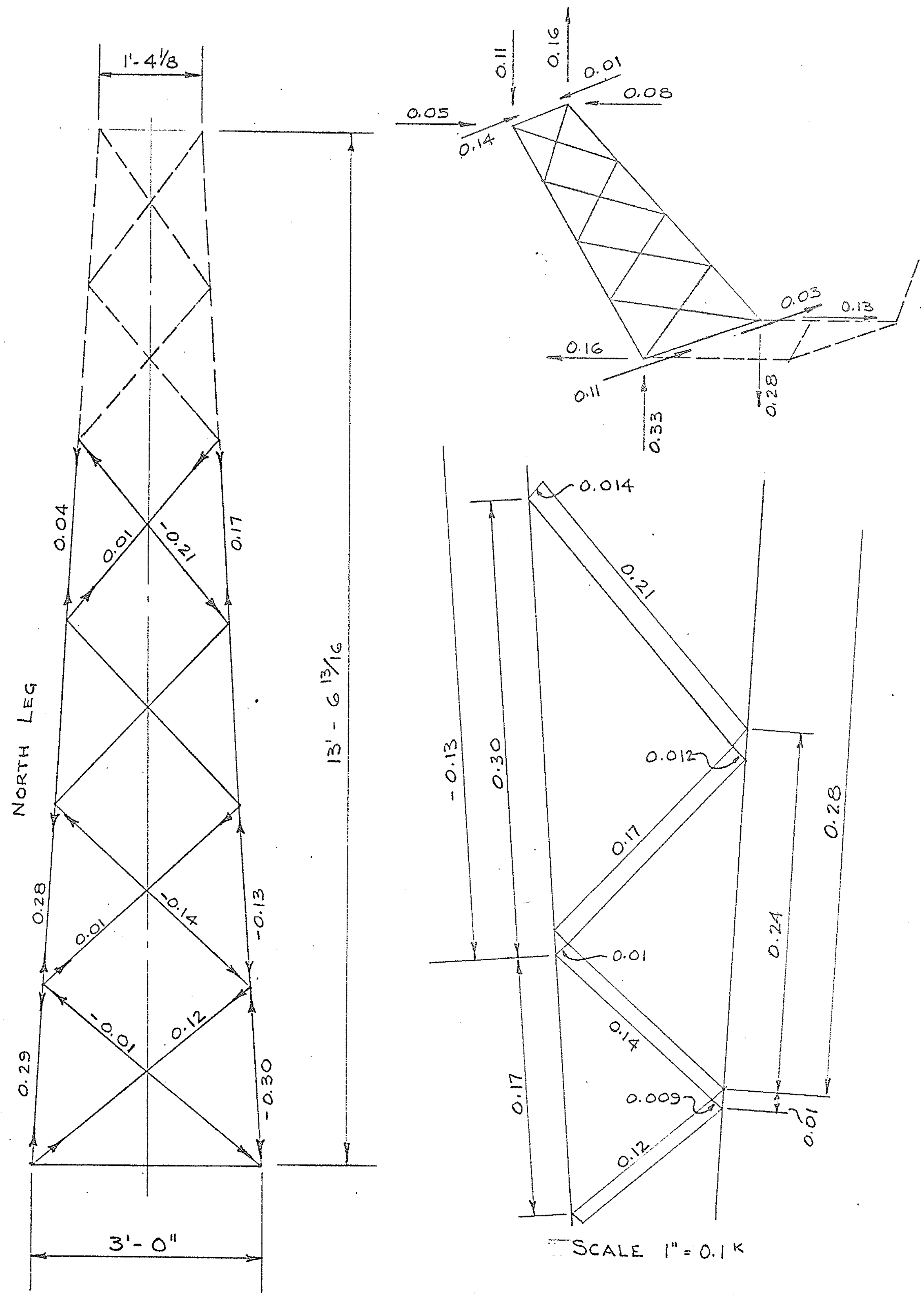






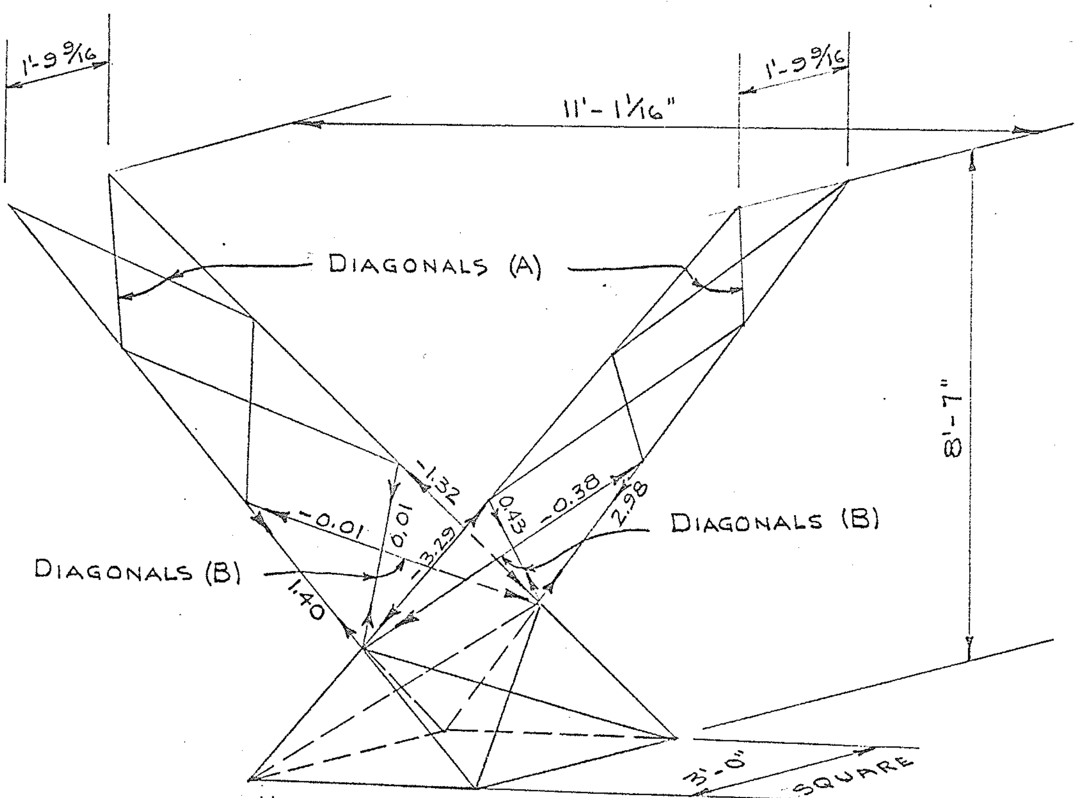
SCALE 1" = 0.5 K

EAST SUPPORT ARM
LONGITUDINAL OUTSIDE FACE

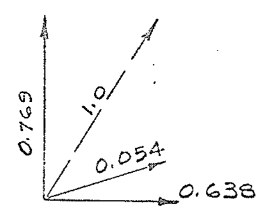


STRAINS MEASURED BY 'C' GAGES

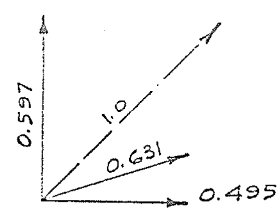
LONGITUDINAL INSIDE FACES OF SUPPORT ARMS



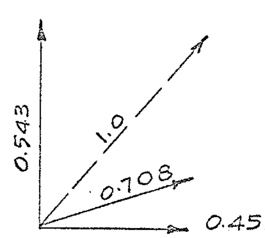
UNIT LOAD COMPONENTS
FOR LEGS



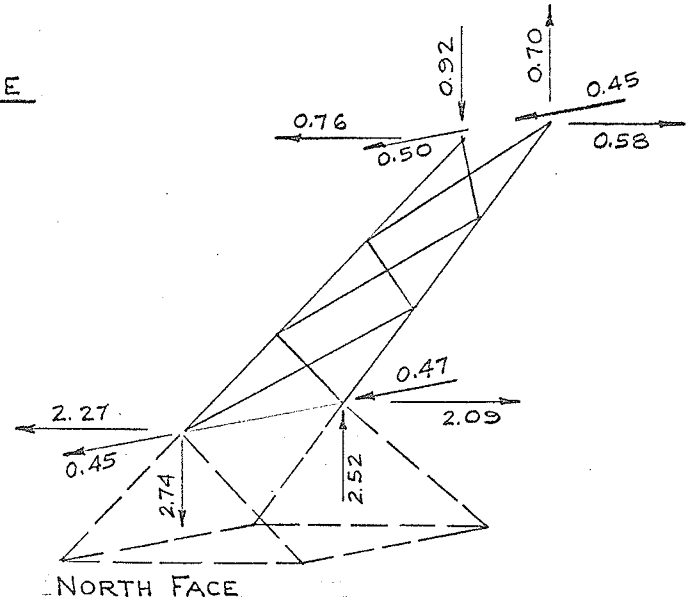
UNIT LOAD COMPONENTS
FOR UPPER (A) DIAGONALS

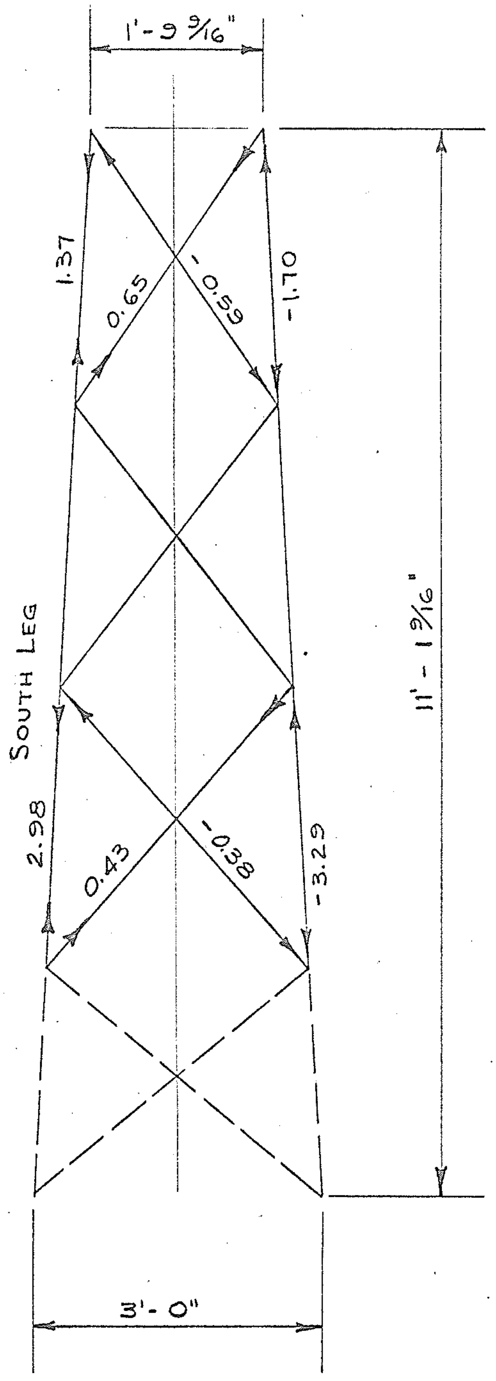


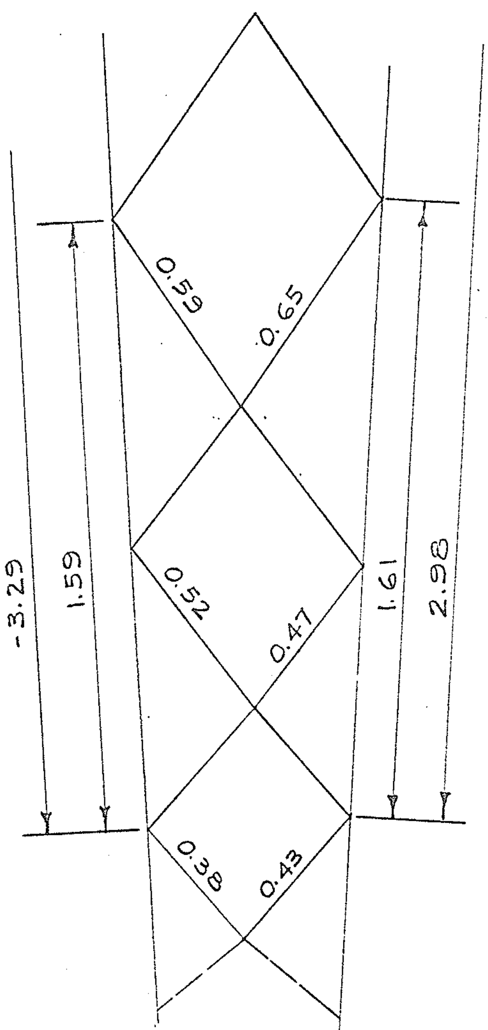
UNIT LOAD COMPONENTS
FOR LOWER (B) DIAGONALS



WEST SUPPORT ARM
LONGITUDINAL INSIDE FACE

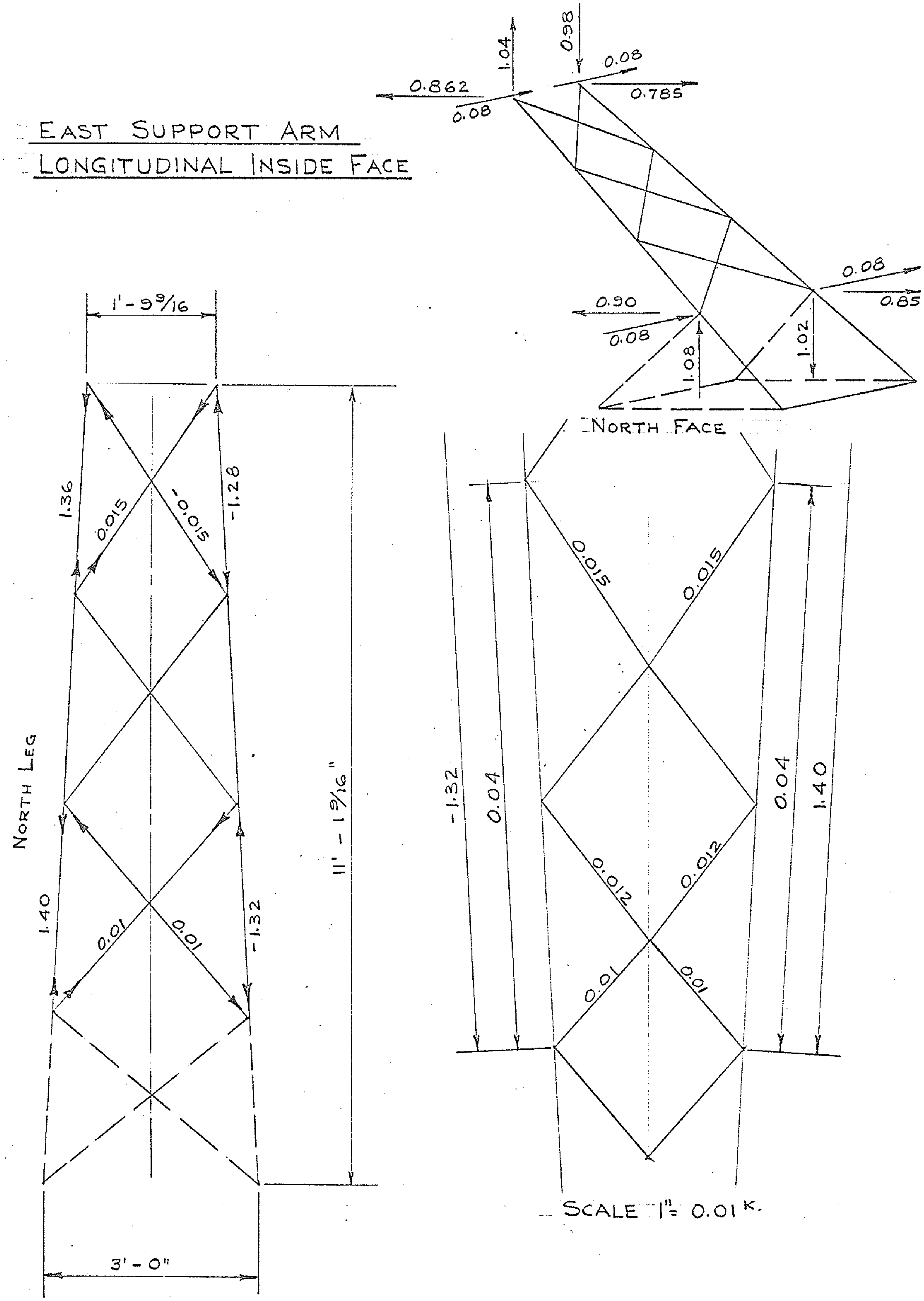






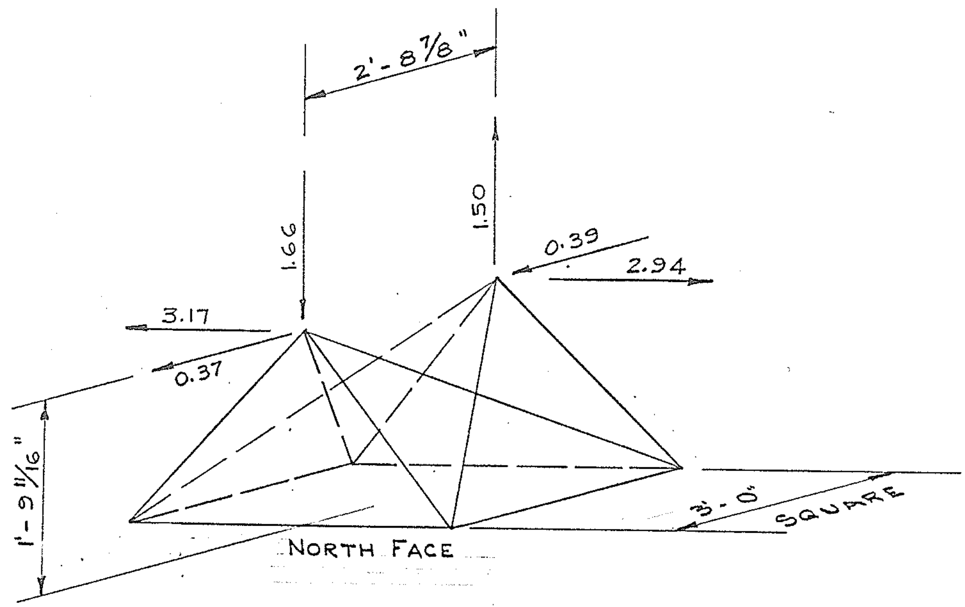
SCALE 1" = 0.5 K

EAST SUPPORT ARM
LONGITUDINAL INSIDE FACE

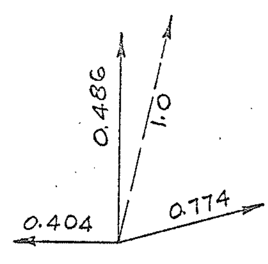


SCALE 1" = 0.01 K.

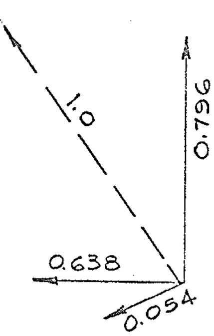
STRAINS MEASURED BY 'C' GAGES
SUMMARY OF LOADS AT INTERSECTION OF
INSIDE LONGITUDINAL SUPPORT ARM FACES



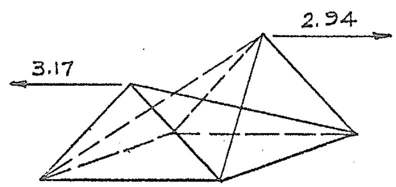
UNIT LOAD COMPONENTS
FOR DIAGONALS

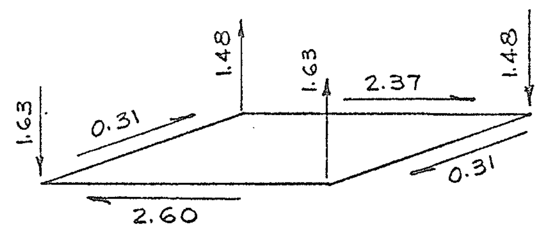


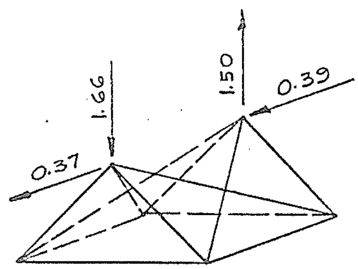
UNIT LOAD COMPONENTS
FOR LEGS

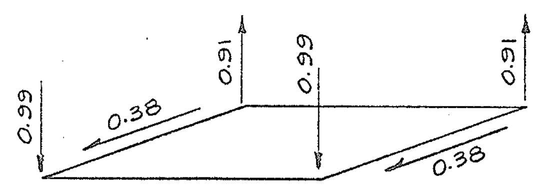


Intersection of Inside Longitudinal Support Arm Faces

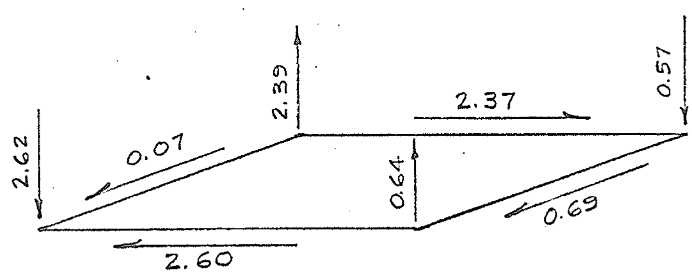






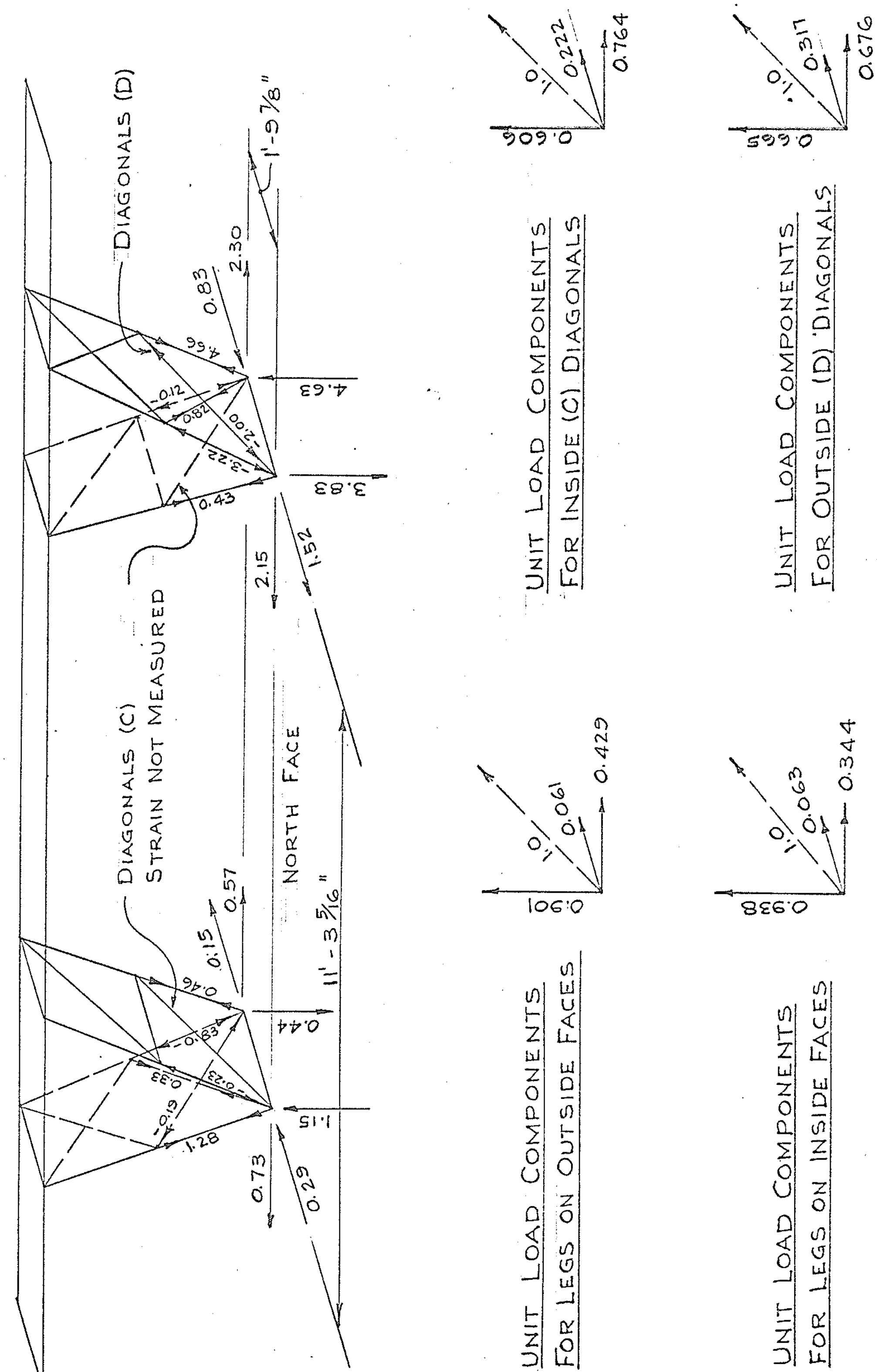


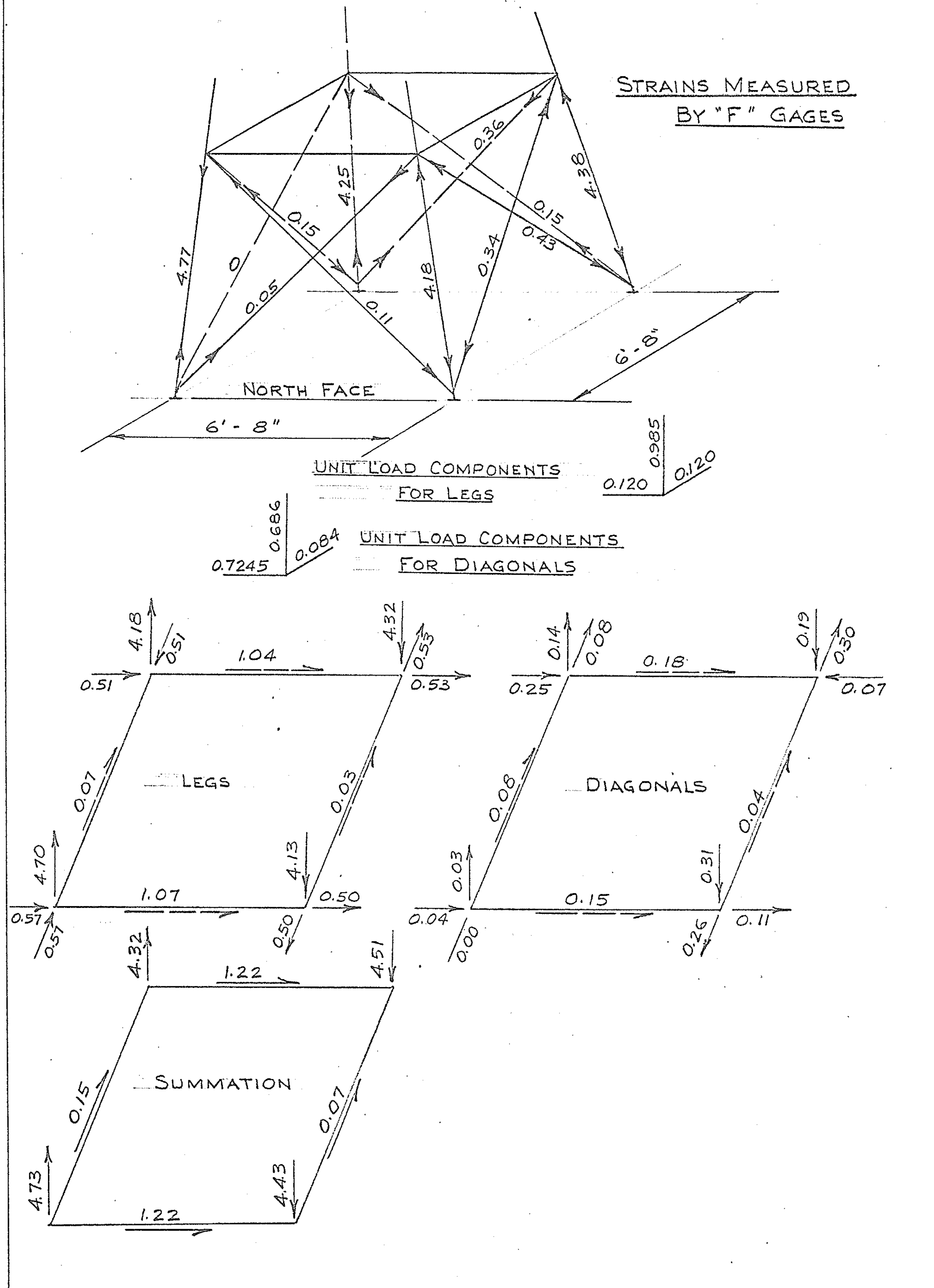
Summation of Loads at Waist From Longitudinal Inside Faces of Support Arms

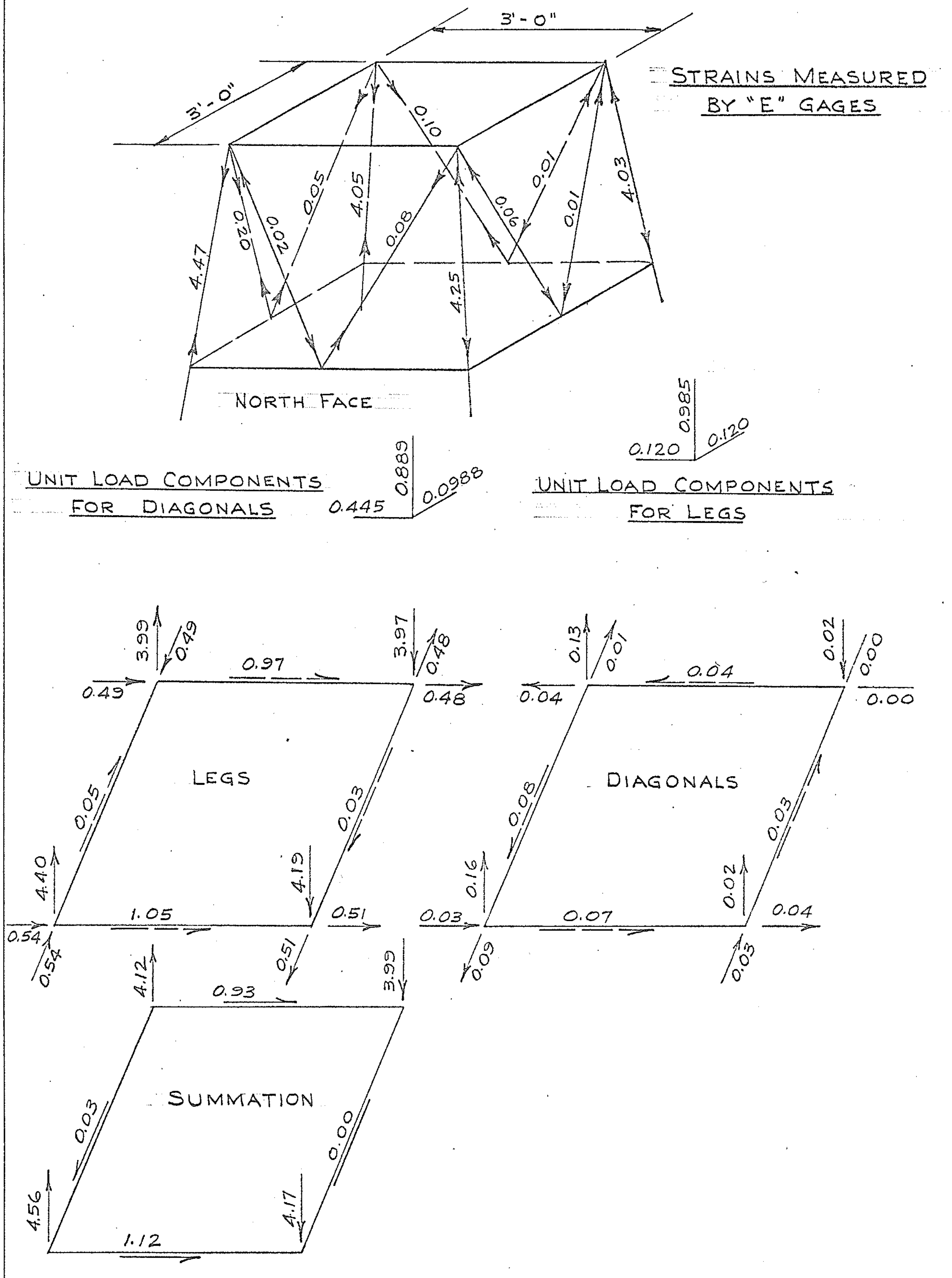


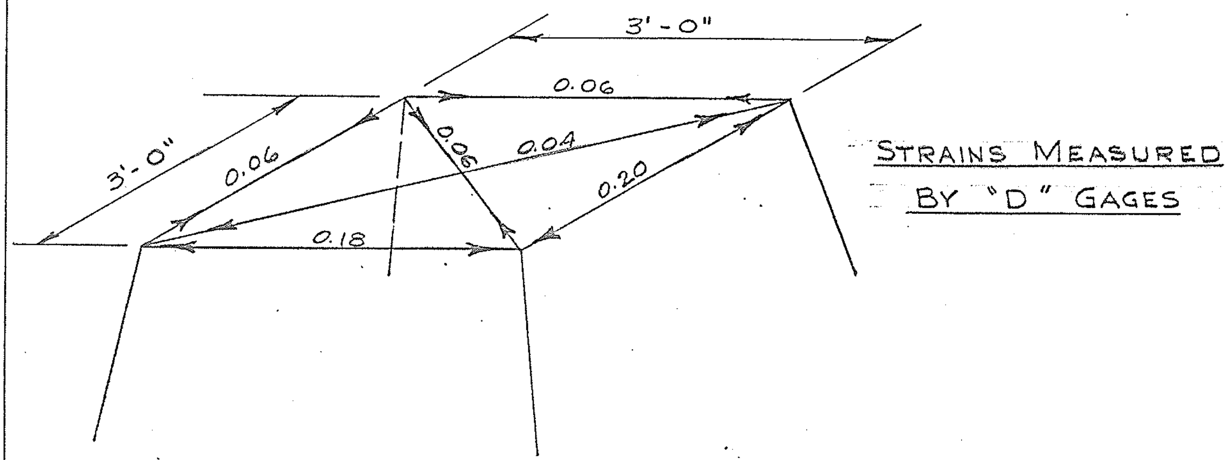
STRAINS MEASURED BY "B" GAGES

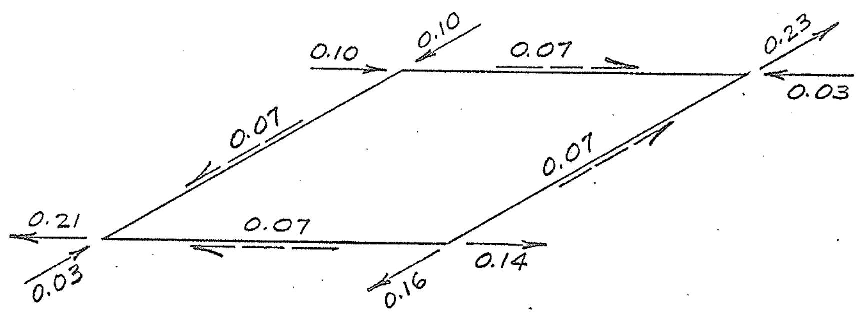
UPPER SUPPORT ARMS

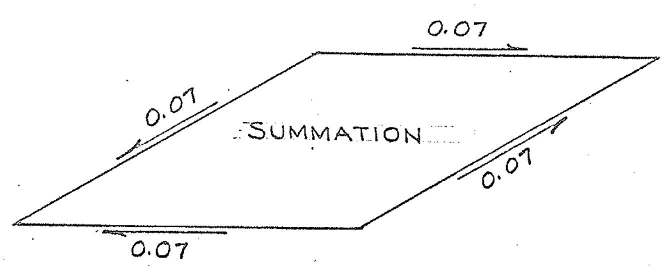



STRAINS MEASURED BY "F" GAGES
NORTH FACE
6'-8"
6'-8"
4.77
0
0.05
0.15
4.25
0.11
4.18
0.34
0.36
0.15
0.43
4.38
UNIT LOAD COMPONENTS FOR LEGS
0.985
0.120
0.120
UNIT LOAD COMPONENTS FOR DIAGONALS
0.686
0.7245
0.084
LEGS
4.18
0.51
0.51
1.04
4.32
0.53
0.53
0.07
0.03
4.70
4.13
1.07
0.57
0.57
0.50
0.50
DIAGONALS
0.14
0.08
0.25
0.18
0.19
0.30
0.07
0.08
0.04
0.03
0.31
0.15
0.04
0.00
0.26
0.11
SUMMATION
4.32
1.22
4.51
0.15
0.07
4.73
4.43
1.22


3'-0"
3'-0"
STRAINS MEASURED BY "E" GAGES
0.10
0.05
4.05
0.20
0.02
0.08
4.47
4.25
0.01
0.06
0.01
4.03
NORTH FACE
UNIT LOAD COMPONENTS FOR DIAGONALS
0.889
0.445
0.0988
UNIT LOAD COMPONENTS FOR LEGS
0.985
0.120
0.120
LEGS
3.99
0.49
0.97
3.97
0.48
0.49
0.48
0.05
0.03
4.40
4.19
1.05
0.51
0.54
0.54
0.51
DIAGONALS
0.13
0.01
0.04
0.02
0.00
0.04
0.00
0.08
0.03
0.16
0.02
0.07
0.03
0.04
0.09
0.03
SUMMATION
4.12
0.93
3.99
0.03
0.00
4.56
4.17
1.12

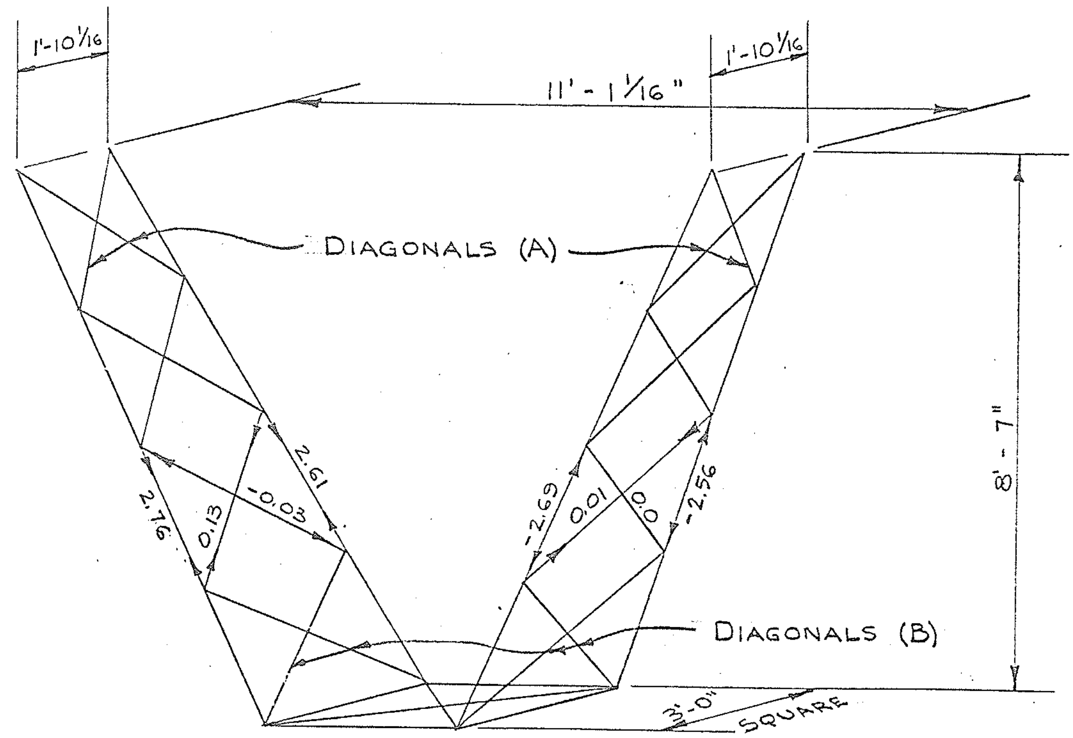

3'-0"
3'-0"
0.06
0.06
0.06
0.04
0.20
0.18
STRAINS MEASURED
BY "D" GAGES


0.10
0.10
0.07
0.23
0.03
0.07
0.07
0.21
0.07
0.03
0.16
0.14


0.07
0.07
SUMMATION
0.07
0.07

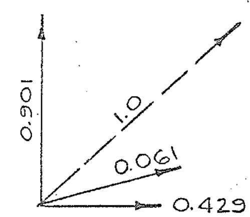
STRAINS MEASURED BY "C" GAGES

LONGITUDINAL OUTSIDE FACES OF SUPPORT ARMS.

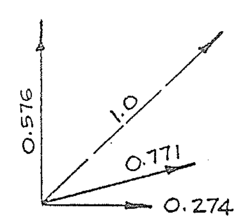


NORTH FACE

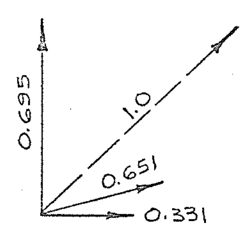
UNIT LOAD COMPONENTS
FOR LEGS



UNIT LOAD COMPONENTS
FOR BOTTOM (B) DIAGONALS

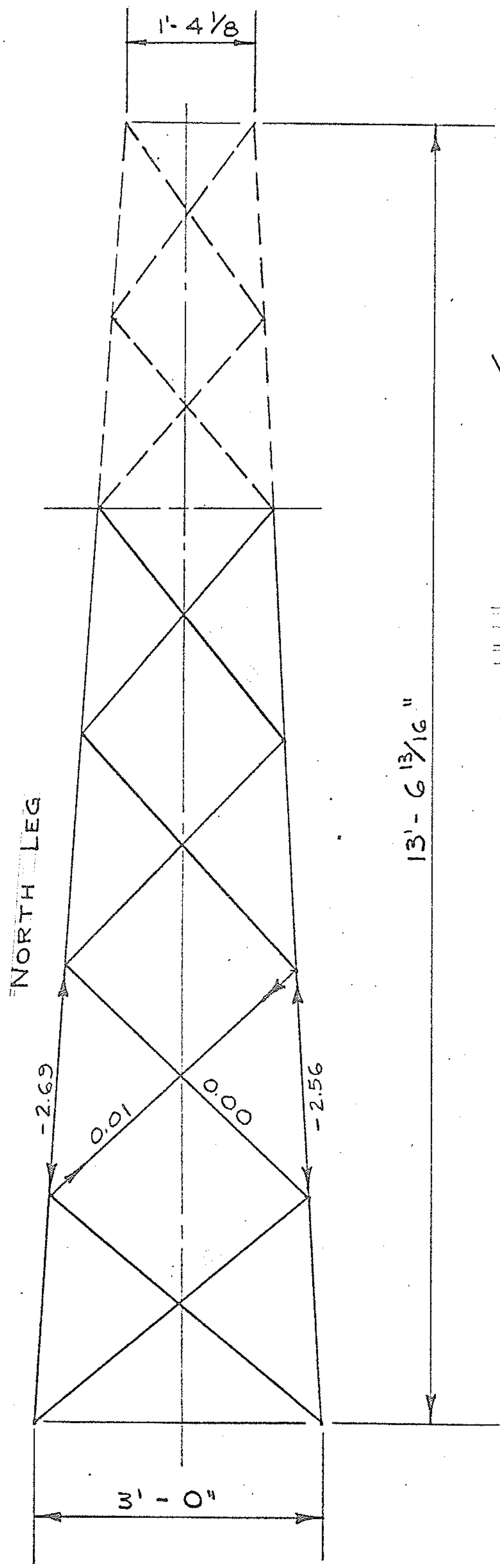


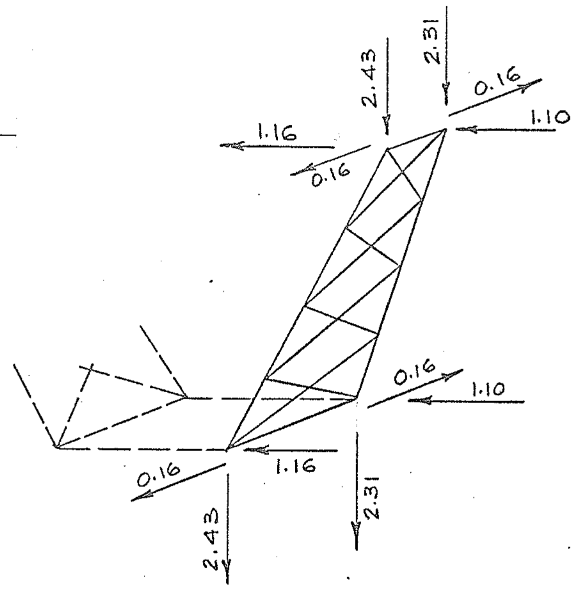
UNIT LOAD COMPONENTS
FOR TOP (A) DIAGONALS



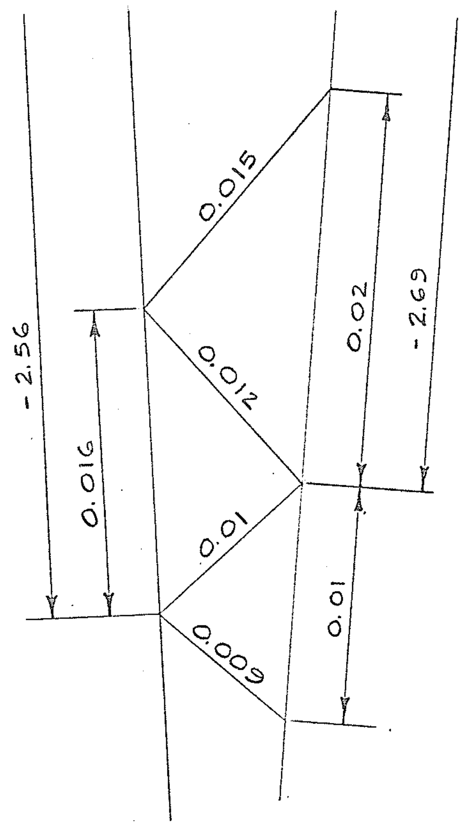
WEST SUPPORT ARM

LONGITUDINAL OUTSIDE FACE



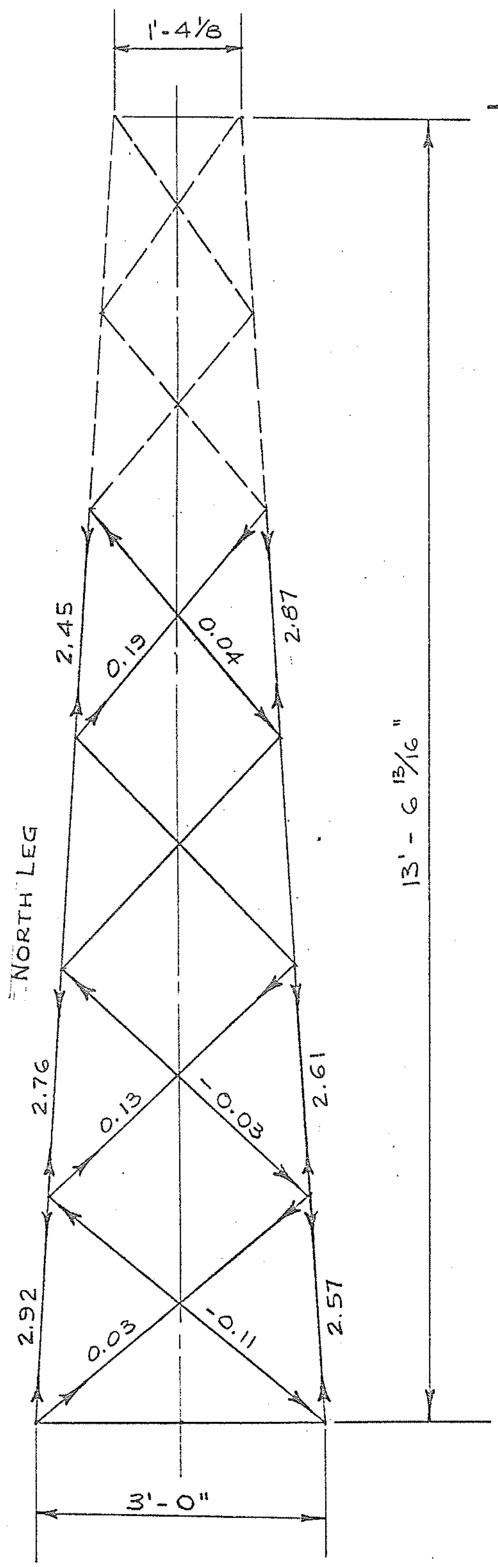


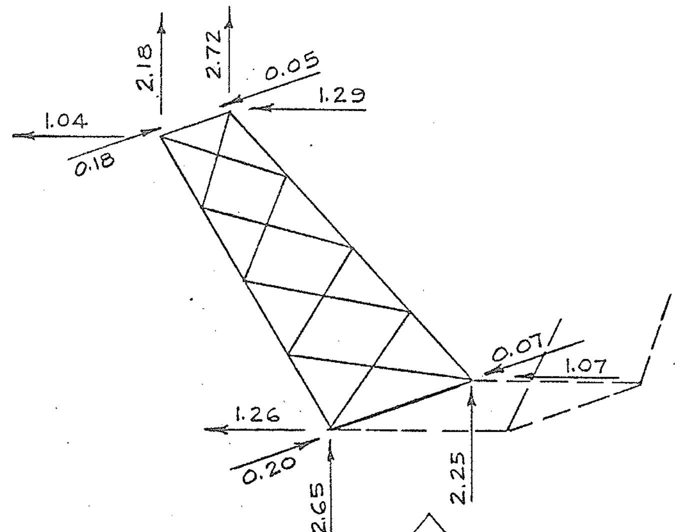
NOTE:
DIAGONAL STRESSES NEGLECTED

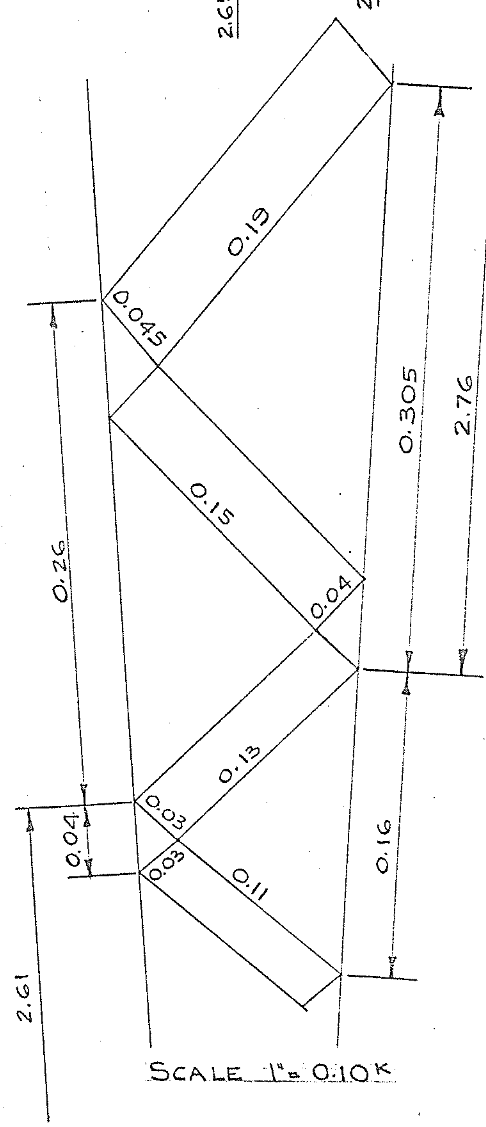


SCALE 1" = 0.01^{K}

EAST SUPPORT ARM
LONGITUDINAL OUTSIDE FACE

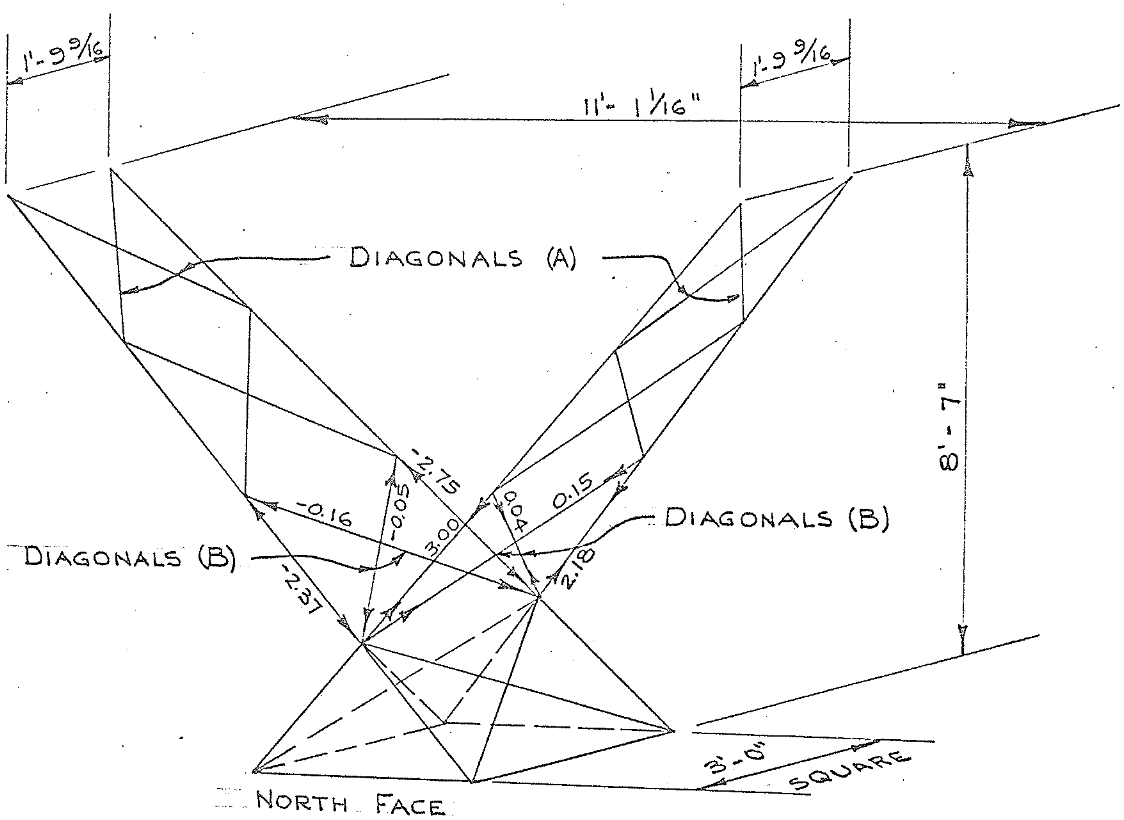




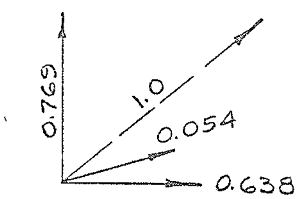


STRAIN MEASURED BY "C" GAGES

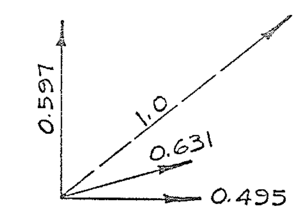
LONGITUDINAL INSIDE FACES OF SUPPORT ARMS



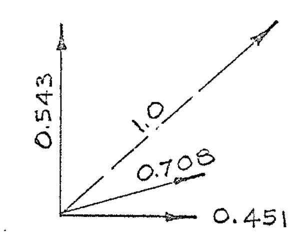
UNIT LOAD COMPONENTS FOR LEGS



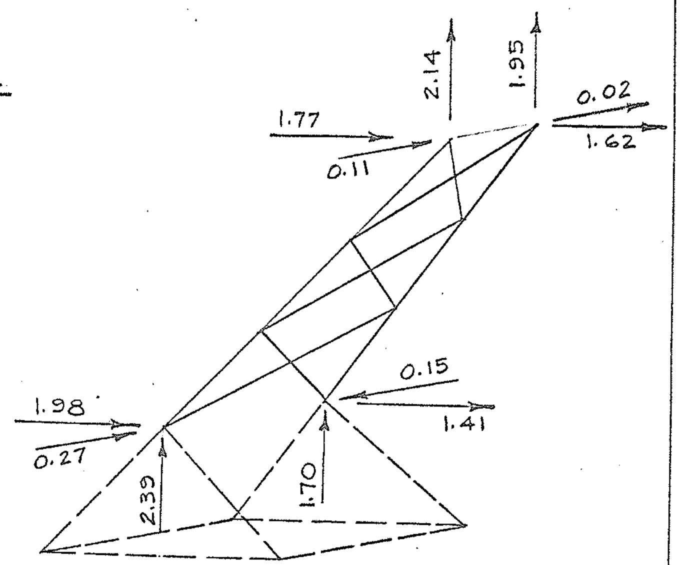
UNIT LOAD COMPONENTS FOR UPPER (A) DIAGONALS



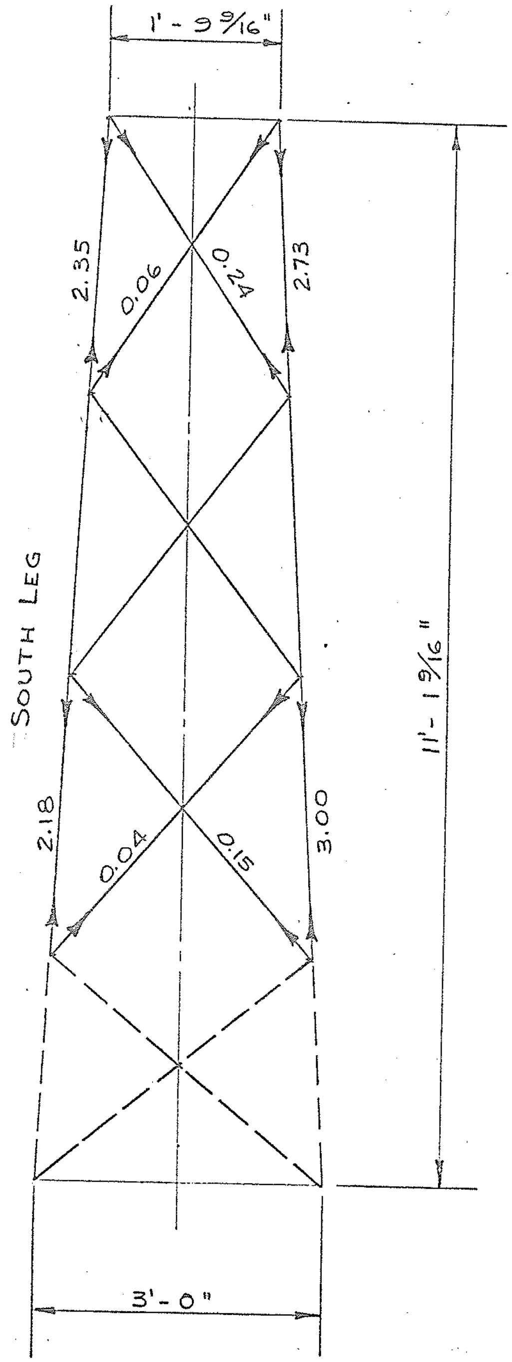
UNIT LOAD COMPONENTS FOR LOWER (B) DIAGONALS

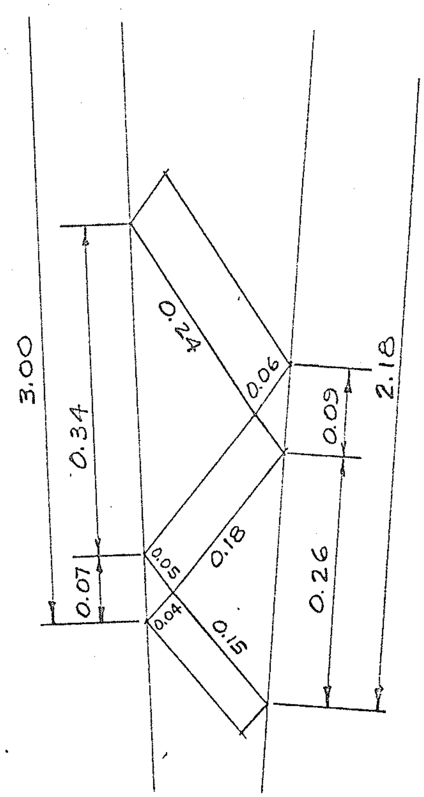


West Support Arm
Longitudinal Inside Face

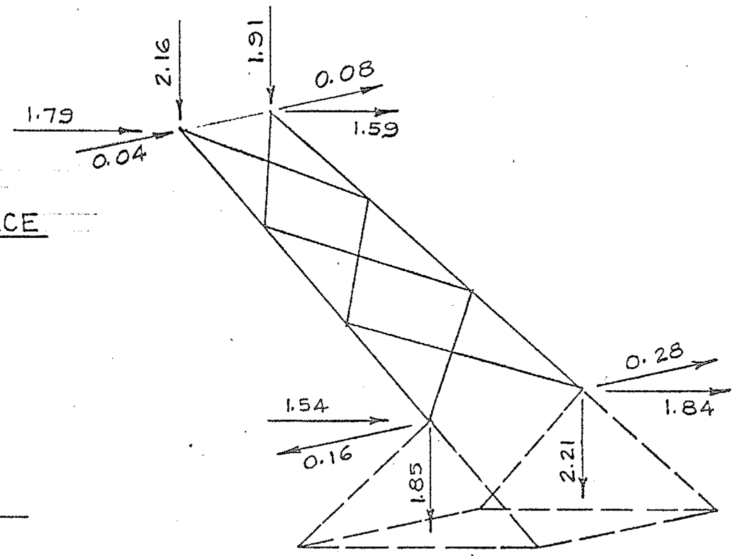


North Face



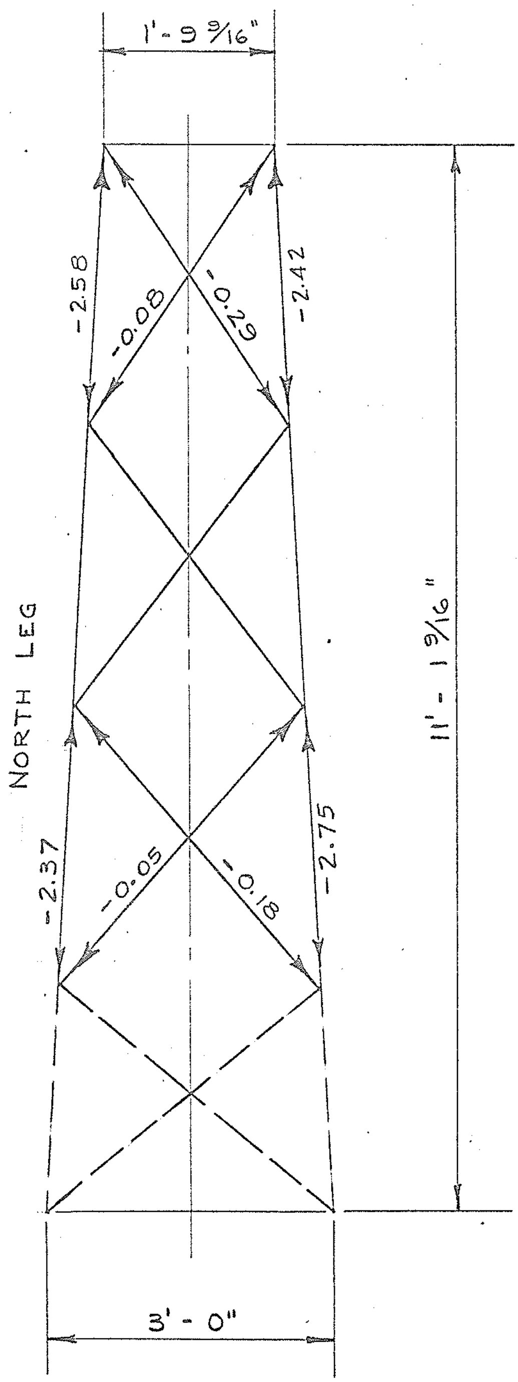


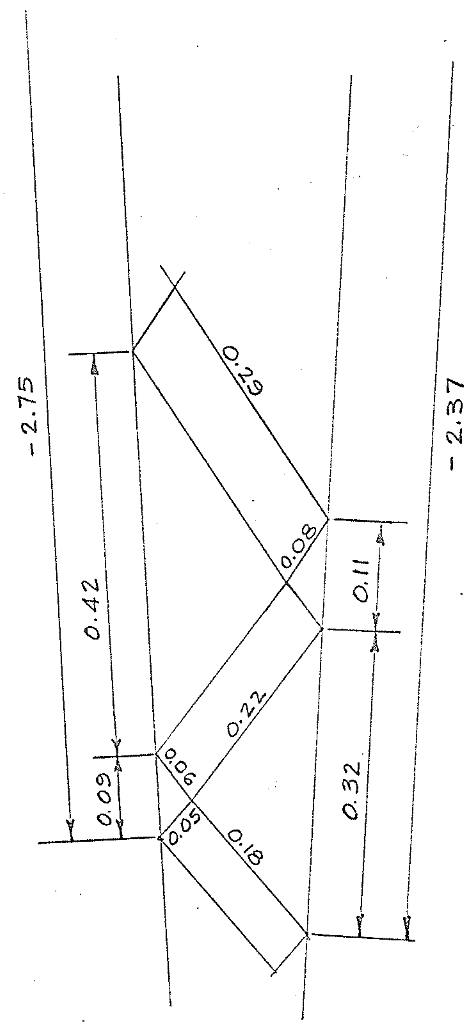
Scale: 1" = 0.20k



NORTH FACE

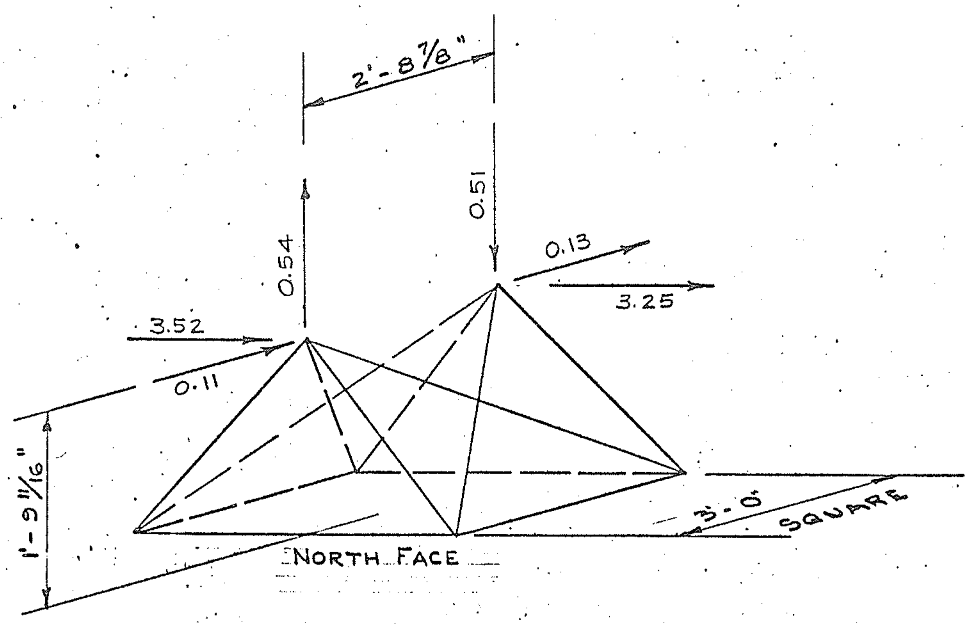
EAST SUPPORT ARM
LONGITUDINAL INSIDE FACE



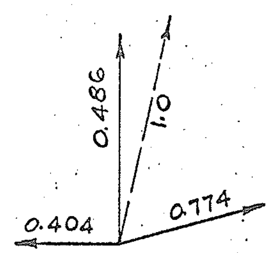


SCALE: 1" = 0.20K

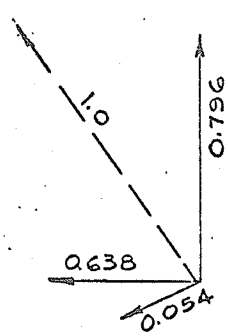
STRAINS MEASURED BY 'C' GAGES
SUMMARY OF LOADS AT INTERSECTION OF
INSIDE LONGITUDINAL SUPPORT ARM FACES



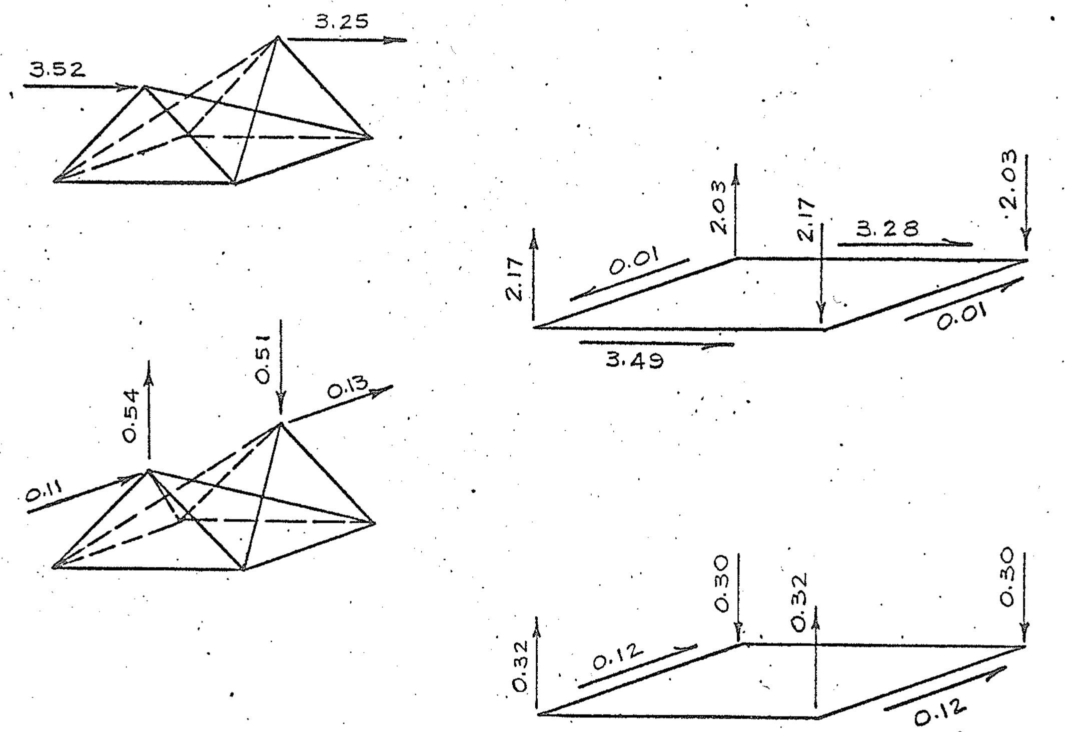
UNIT LOAD COMPONENTS
FOR DIAGONALS



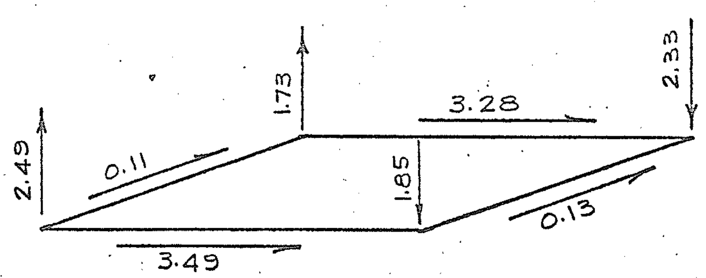
UNIT LOAD COMPONENTS
FOR LEGS

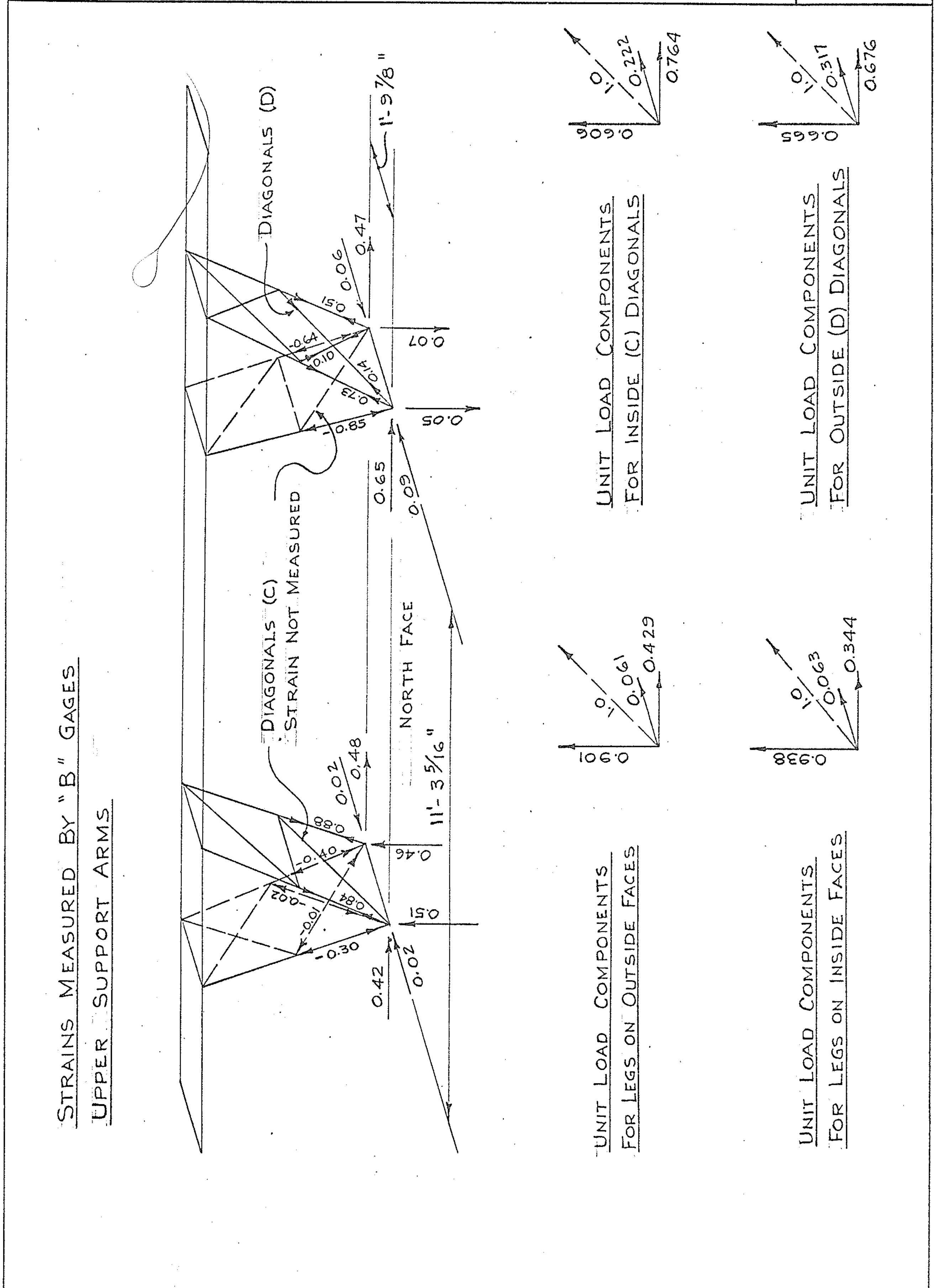


INTERSECTION OF INSIDE LONGITUDINAL SUPPORT ARM FACES



SUMMATION OF LOADS AT WAIST FROM LONGITUDINAL INSIDE FACES OF SUPPORT ARMS





STRAINS MEASURED BY "B" GAGES
UPPER SUPPORT ARMS
DIAGONALS (D)
DIAGONALS (C)
STRAIN NOT MEASURED
NORTH FACE
1'-9 7/8"
11'-3 5/16"
0.47
0.06
0.51
0.07
-0.64
0.10
0.14
0.73
0.85
0.05
0.65
0.09
0.48
0.02
0.88
0.46
-0.40
-0.02
0.84
-0.01
0.51
-0.30
0.42
0.02
UNIT LOAD COMPONENTS
FOR INSIDE (C) DIAGONALS
0.606
1.0
0.222
0.764
UNIT LOAD COMPONENTS
FOR OUTSIDE (D) DIAGONALS
0.665
1.0
0.317
0.676
UNIT LOAD COMPONENTS
FOR LEGS ON OUTSIDE FACES
0.901
1.0
0.061
0.429
UNIT LOAD COMPONENTS
FOR LEGS ON INSIDE FACES
0.938
1.0
0.063
0.344

CHAPTER XI

DISCUSSION

General

In order to fulfill the intended purpose of this study, the measured axial member loads were used as a basis for determining a distribution of stresses in the tower structure.

The first step in this procedure was to determine by graphical analysis the loads in related pertinent members, since it was not feasible to measure the loads in every structural member due to the large number of strain gages that would have been required.

Having determined the loads in all the necessary members, the indicated applied loads and/or reactions were derived for the respective frames (e.g. inside and outside faces of support arms. four faces of the tower body etc.) These calculations are performed on pages 95 to 143.

Subsequently all these indicated applied loads and/or reactions were summarized at the various control points (support point, waist and base of tower) on Figures 10 H, 10 J, 10 K and 10 M.

The methods of stress analysis used in the foregoing pages are based on the assumption that the members are connected at the joints by frictionless pins. It was further assumed that the gravity axes of members coincide with the working lines of the tower, and that all center lines meet at the pin center of each joint. Therefore, for all loading conditions, the members are assumed to be subjected to direct stresses of tension and compression only.

An inspection of the four summary sheets (Figure 10 H, J, K, M) demonstrates that in some instance the basic laws of static equilibrium are apparently not satisfied by the indicated applied loads. There are numerous possible reasons for these discrepancies of which the following are chief; flexure of members, framing stresses from continuity, distortion of the tower structure, and to a lesser extent, inaccuracies in fabrication and experimental errors.

In the analysis, the influence of each of these secondary effects was virtually impossible to assess. However, a comparison of applied load and resisting loads at the various control points shows that the stress analysis is sufficiently accurate to permit determination of the actual distribution of stress in the model structure.

Behaviour of Structure under Longitudinal Load at Ground Wire Suspension Point

Examining firstly the longitudinal ground wire loading condition, the results of which are summarized in Figure 10 H, the following effects were noted:

(1) A longitudinal test load of 2455 pounds was applied to the load cable. Since there was an estimated 8 per cent friction loss (see page 68), a net load of 2250 pounds was assumed to act on the tower. The indicated longitudinal load at the various control points is consistently less than this value (2250 pounds) with the exception of that measured by gages at the tower base. The lower values can be attributed primarily to flexure and framing action in the support arm chords and in the tower legs due to the unavoidable rigidity of some joints.

(2) For similar reasons the indicated torsional moment is consistently lower than the theoretical value computedfrom the indicated longitudinal load with a moment arm of 8.25 ft.

(3) A check of the vertical load components resulting from the longitudinal overturning moments demonstrates a fairly close agreement

with the theoretical values.

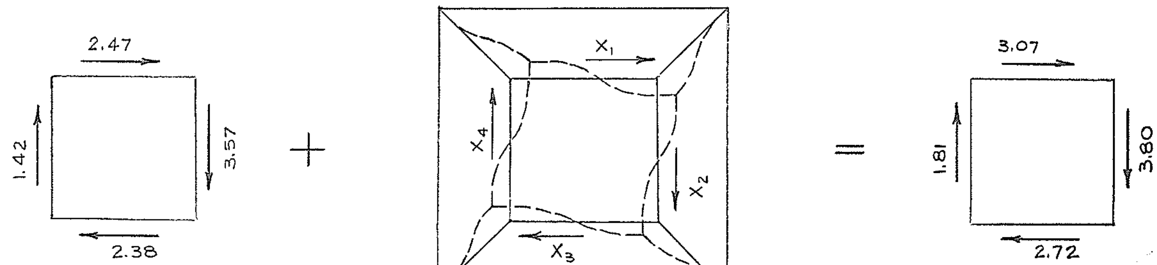
(4) For the condition of longitudinal load at ground wire suspension point, it can be observed that the majority of the load is transferred from the ground wire peak to the support point level by the outside face of the upper support arm on the loaded side of the tower and to a lesser degree by the outside face of the upper support arm on the unloaded side of the tower. Only minor stresses occur in inside faces of the upper support arms.

(5) At the support point, the overturning moment is resisted by the outside face of the lower support arm, while the shear is resisted equally by the inside and outside faces of the lower support arm.

(6) The shear carried down the inside face of the lower support arm is resisted by a statically indeterminate frame formed by the intersecting inside faces of the lower support arms. The method of analysis of this statically indeterminate frame[7] is shown in the calculations on pages 104-106. It was necessary to resort to this solution since the assumption that both inside faces acted independently as trusses, cantilevered from the waist, yielded results which were inconsistent with those measured. Due to the nature of the detail of the tower at this point, it must be expected that the inside faces of the lower support arms cannot act independently of each other.

(7) It can be noted that the resulting loads applied at the waist level by the support arms combined with the face shears, obtained from the loads of the horizontal diaphragm, show a fairly close comparison with resisting loads calculated at the waist level from the 'E' gages. The difference in indicated torsion (face shear) above and below the waist is accounted for by realizing that the rigidity of

connections in the waist diaphragm will distribute torque to the tower body by framing action in addition to that transferred by ordinary truss action. An indication of the deformation and the resulting framing action is shown in the sketch below.

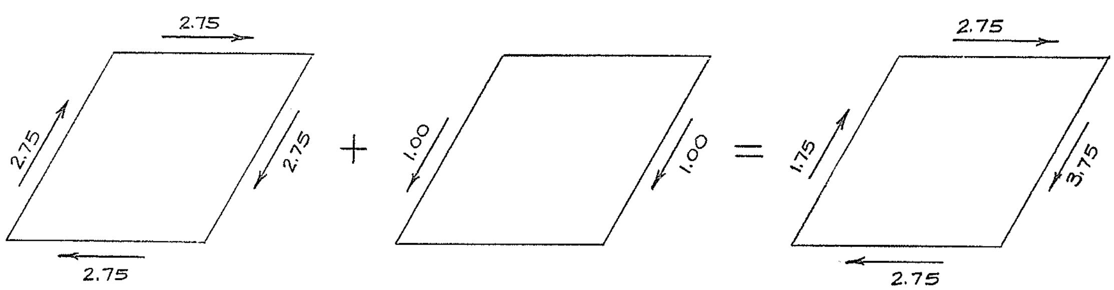


INDICATED RESISTING LOADS AT WAIST LEVEL FROM AXIAL MEMBER LOADS.

PLAN VIEW OF TOWER BODY AT WAIST LEVEL SHOWING NATURE OF FRAME DEFORMATIONS DUE TO LOADS APPLIED AT WAIST.

INDICATED LOADS APPLIED AT WAIST LEVEL BY SUPPORT ARMS.

(8) The following sketches verify the commonly accepted fact that the torsional shears are distributed equally to all four faces of the tower body by the diaphragm, since the results are in close agreement with those measured by the 'E' gages and with those indicated by summing the 'C' and 'D' gages at waist level.



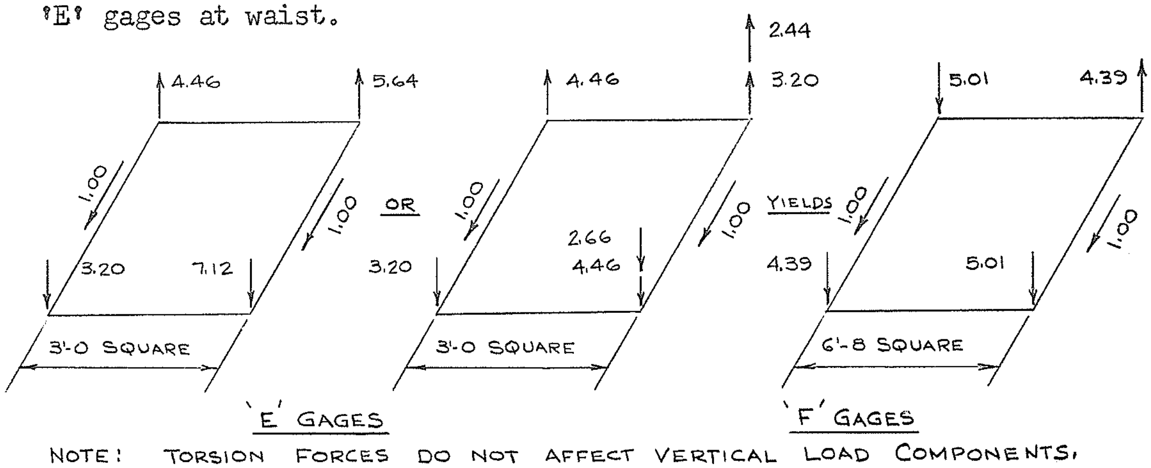
TORSIONAL SHEAR

LONGITUDINAL SHEAR

SUMMATION

Hence below the waist the longitudinal shears are resisted equally by the longitudinal faces and the torsional shears are resisted equally by four faces of the tower body.

(9) Finally, the following calculation shows that the vertical load components at the base are consistent with those measured by the 'E' gages at waist.



Idealized Stress Diagrams for Longitudinal Load at Ground Wire Suspension Point

Based on the above observations, an idealized stress distribution was assumed and resisting and/or applied loads were computed at the various control points and are summarized on Figure 11 A. A comparison of the measured loads at the control points (Figure 10 H) with those calculated on Figure 11 A demonstrates a satisfactory parallel.

At this point, it should be explained that the relative magnitudes of loads carried by the two support arms were arrived at by realizing that there is a change in slope from the outside face of the ground wire peak to the outside face of the upper support arm at the level of the bottom chords of the girder. Due to this change in slope, there is an unbalanced horizontal force at points 'A' and 'B' (see Figure 11 A).

The overturning effect applied to the loaded ground wire peak produces compression on the north face and tension on the south face, hence the above mentioned unbalanced horizontal forces are in opposite directions producing a couple with a moment arm equal to the width of the girder (For a longitudinal ground wire load of 2.0 kips, the unbalanced horizontal forces are equal to 0.77 kips). To balance this transverse couple, a longitudinal load of (0.77 x 1.33/14.67) = 0.07 kips was applied to the unloaded upper support arm (outside face), leaving a net longitudinal load of (2.00 - 0.07)= 1.93 kips to be resisted by the loaded upper support arm (outside face).

It becomes evident from a comparison of Figures 10 H and 11A, as it does also from a perusal of Table XI A that the above assumptions are basically correct.

The explanation for the difference in vertical load values can be found in the fact that at the intersection of the two inside faces of the lower support arms, the loaded face introduces internal stresses into the unloaded face by virtue of the deflection of the intersection points. These internal stresses, being smaller than those in the loaded facees, are of minor concern in the design of the support arm members but do cause a significant redistribution of the overturning vertical load components on the tower body. This redistribution of vertical load components has the effect of increasing the loads in the diagonals on the most heavily loaded face of the tower body, and decreases the stresses in the legs of the tower body on the same face.

Having established a stress distribution in the structure, it is possible to construct the idealized stress diagrams for a longitudinal load at the ground wire suspension point. For ready comparison with the loads measured in the tower members, a longitudinal load of 2.0 kips was selected. The idealized stress diagrams are shown on Figures 11 B and 11 C and the results are recorded and compared on Table XI A.

<u>Behaviour of Structure under Longitudinal Load at Conductor Suspension Point</u>

Considering secondly the longitudinal conductor loading condition (Figure 10 K) the following observations were made:

(1)The indicated longitudinal load calculated at the various control points are consistently lower than the applied test load. The test load applied to the longitudinal load cable was 2,255 pounds but an estimated friction loss of about 8 per cent (ref.page 68) resulted in a load of 2,070 pounds being applied to the tower structure. The average longitudinal load indicated by the various gage groups was 1,860 pounds, which is approximately 10 per cent less than the estimated 2,070 pounds load.

Similar to the behaviour of the tower structure under longitudinal load at the ground wire point, flexure, framing action and torsion in the support arm chords and tower body legs must be assumed to be responsible for the inconsistency discussed above. This is further evidenced by the fact that for both cases of longitudinal loading that were considered (ground wire point and conductor point), the longitudinal load indicated by the 'F' gages (immediately above the tower base) where it is thought that a minimum of framing action should occur, is higher than that indicated at the other levels.

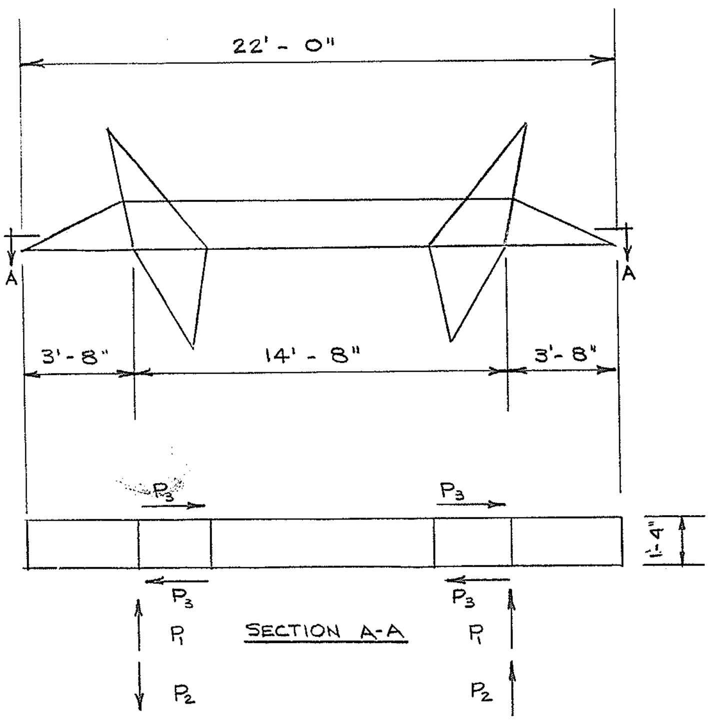
(2) The indicated torsional moments are lower than those computed from the indicated longitudinal load with a moment arm of 11 ft. This consequence can be attributed to flexure and framing action in the structural members as well.

(3) The vertical load components due to the longitudinal overturning moments appear to be in conformity with those computed from the indicated longitudinal load. The latter are shown in brackets on Figure 10 K.

An isolated, exceptionally large discrepancy in the vertical load components indicated by the 'B' gages can be explained partially by the fact that the loads in the inside face diagonals were not measured. The magnitude of the possible loads in these diagonals, however, are insufficient since preliminary calculations introducing member loads of this magnitude yielded results with even larger and unacceptable discrepancies in the longitudinal and torsional shears. Therefore, the major portion of this discrepancy must be attributed to cumulative error. It is noted in this regard that the vertical load components indicated by the 'B' gages are 'differences' since in all four cases opposite stresses exist in the intersecting chords of the outside and inside faces. Therefore a large cumulative error is possible.

(4) For this condition of longitudinal load at the conductor suspension point, the structure appears to react differently than for the longitudinal ground wire loading condition. For example, appreciable stresses occur in the chords of the inside faces of the upper support arms (page 131) and also the inside faces of the lower support arm appear to be resisting more than one half of the shear applied at the support point (e.g. pages 124, 127), whereas this was not the case for the longitudinal load at the ground wire point.

Inasmuch as the following calculations result in a stress distribution which is compatible with the measured stress distribution, it may be stated that the longitudinal shear is resisted equally and totally by the outside faces of the <u>upper</u> support arms. The torsional moment is resisted largely by the outside faces and to a lesser degree by the transverse faces of the <u>upper</u> support arms as shown below.



p = average indicated longitudinal load

= 1860 pounds

$$P_1 = \frac{P}{2} = 930 \text{ pounds}$$

$$P_2 = \frac{11\ P - 2(1.3\ P_3)}{14.67}$$

To find the magnitude of P_3, the average measured load in the inside face chord members of the upper support arm was computed (0.31 kips). This value of 0.31 kips indicates a transverse shear of 0.19 kips per face per support arm by virtue of the respective member slopes.

As shown in the above calculations, this results in a net large shear on the outside face of the support arm adjacent to the load point and a net small shear on the opposite support arm.

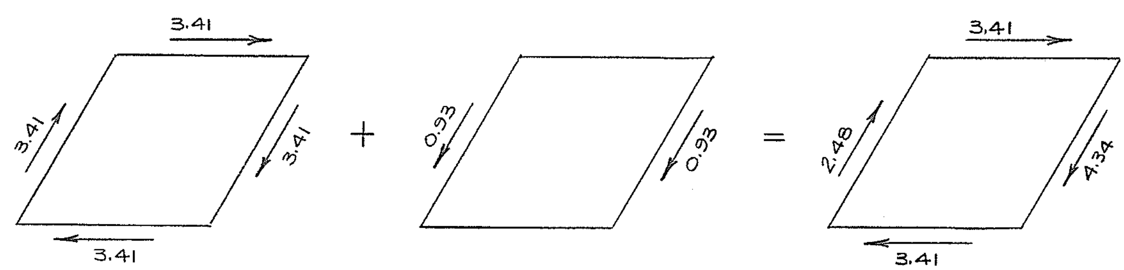
(5) At the support point (see pages 124, 125, 127, 128), the longitudinal shear is resisted equally by the longitudinal faces of the <u>lower</u> support arms while the transverse torsional shear is resisted

by the transverse faces. The overturning moments resulting from the longitudinal shears are carried down the outside faces of the lower support arm to the waist.

(6) The shear carried down the inside faces of the lower support arm is resisted and analyzed at waist level in a manner similar to that described for the longitudinal ground wire loading.

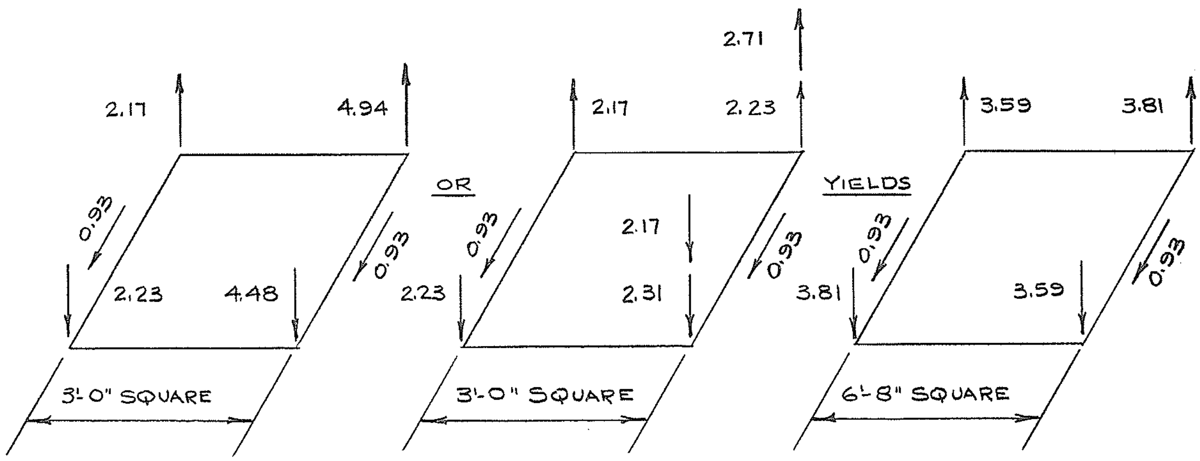
(7) Observations made for the longitudinal ground wire loading regarding distribution of torsional shears, longitudinal shears and the effect of rigidity of connections at waist level apply for this case of loading as well.

(8) Similar to the longitudinal ground wire loading, the following sketches confirm the equal distribution of torsional shear to all four faces of the tower body. Below the waist, the longitudinal shear is resisted equally by the longitudinal faces and the torsional shear is resisted equally by all four faces of the tower body.



Torsional Shear Longitudinal Shear Summation

(9) Finally, the following calculation shows that the vertical load components at the base are consistent with those measured by the 'E' gages near the waist.



'E' Gages

'F' Gages

Note: Torsional forces do not affect vertical load components.

Idealized Stress Diagrams for Longitudinal Load at Conductor Suspension Point

On the basis of the foregoing observations, an idealized stress distribution for the structure under longitudinal load at conductor point was established as shown in Figure 11 D. Having established the stress distribution, it was possible to construct idealized stress diagrams for this case of loading.

These diagrams are shown on Figures 11 E and 11 F. A longitudinal load of 1,860 pounds was selected for the determination of idealized member loads which are recorded and compared on Table XI A.

Behaviour of Structure under Transverse Loading at Ground Wire Support Point and at Conductor Suspension Point

Finally, the distribution of stress in the structure resulting from a transverse loading applied at the ground wire support points and at the conductor suspension points as shown in Figures 10 J and 10 M were observed.

For the transverse loading at the ground wire support points, a total transverse load of 1,100 pounds was applied to the load cable but an estimated 8 per cent friction loss (Page 68) resulted in a load of 1,010 pounds applied to the structure. The average load indicated by the five gages groups is 1,010 pounds.

For the transverse loading at the three conductor suspension points, a load of 2,350 pounds was applied to the two load cables resulting in an estimated load of 2,150 pounds applied to the structure, this decrease being caused by the estimated 8 per cent friction losses in the loading system (Page 68). The average load indicated by the five gage groups is 2,170 pounds.

For both conditions of transverse loading, the structure showed considerably less distortion than under the longitudinal loading conditions which applied a torsion to the structure. Hence a minimum of framing action occurs and the average indicated loads (based entirely on axial member loads) are in close agreement with the applied test load.

Generally, it was noted that the stress distribution for these conditions of transverse loading are consistent with design practices used to analyze tower structures under transverse loading. This is further evidenced by the close agreement of measured and computed member loads shown on Table XI B.

The computed loads were derived by using the idealized stress diagrams shown on Figure 11 G and are similar to those used in the actual design of this model structure.

IDEALIZED STRESS DISTRIBUTION

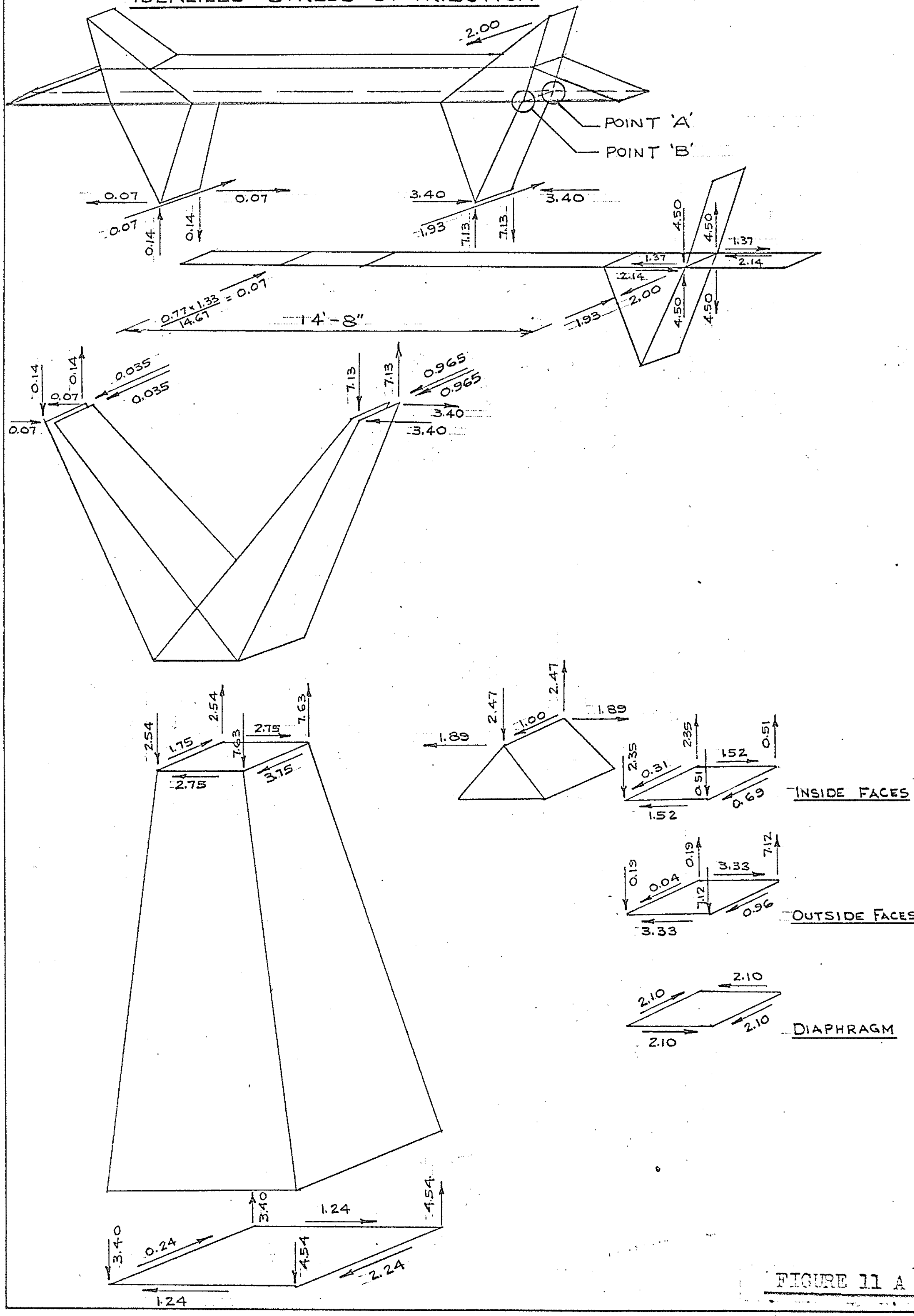
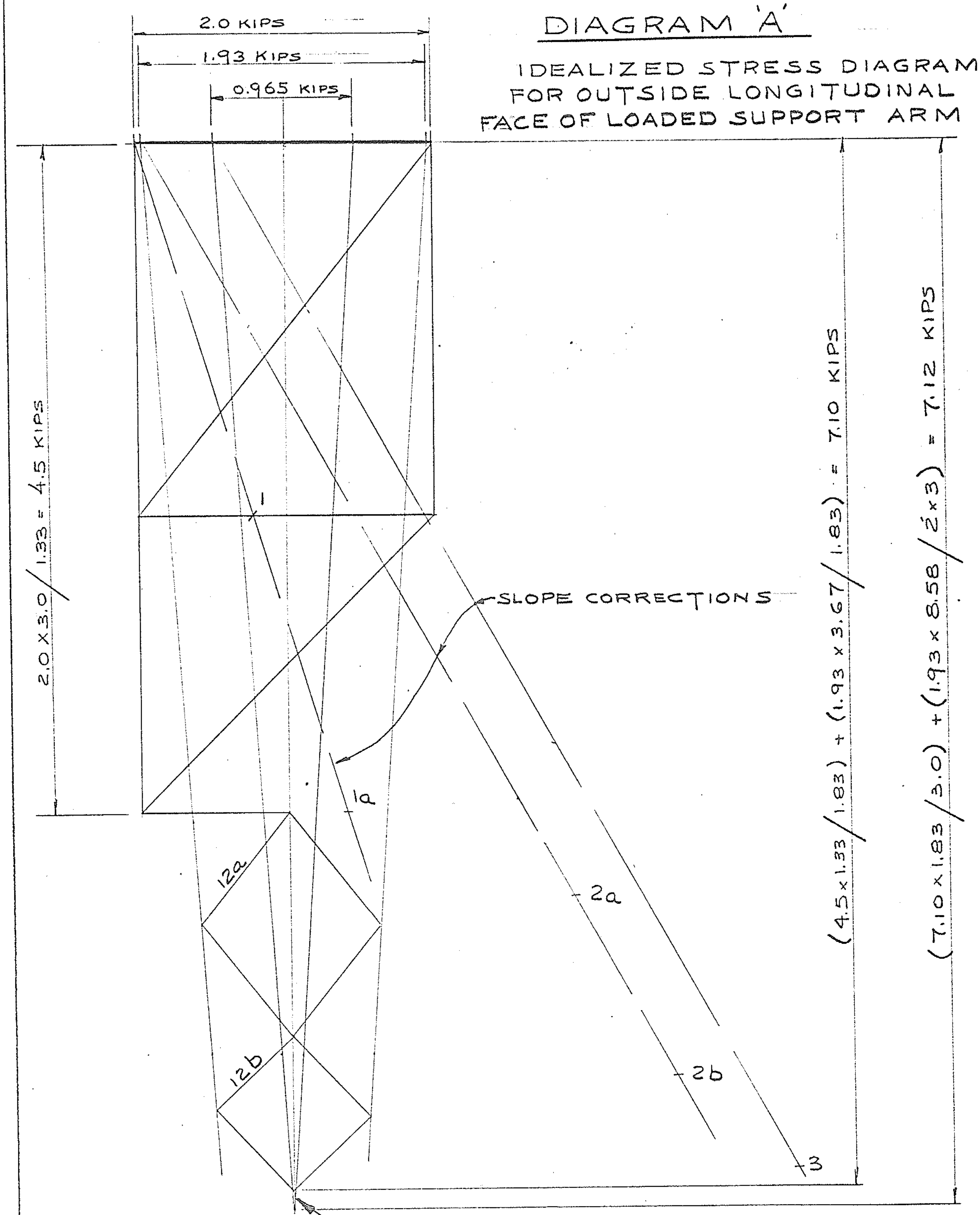


FIGURE 11 A

LONGITUDINAL LOAD AT WEST GROUND WIRE SUPPORT POINT

DIAGRAM 'A'

IDEALIZED STRESS DIAGRAM FOR OUTSIDE LONGITUDINAL FACE OF LOADED SUPPORT ARM



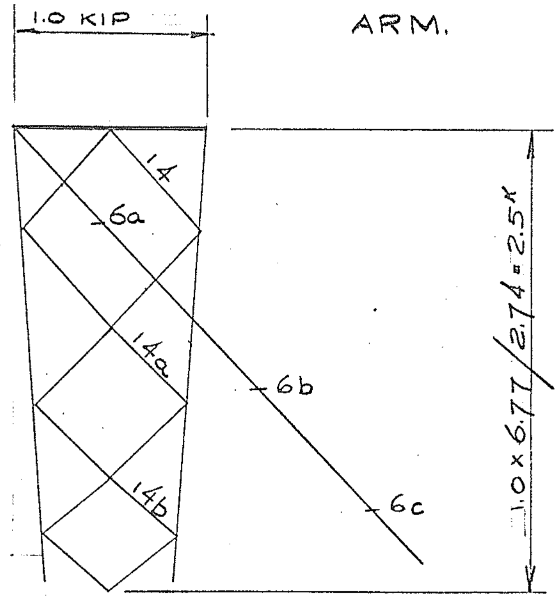
NOTE: DIAGONAL STRESSES IN OUTSIDE FACE OF LOWER SUPPORT ARM EQUAL ZERO (MEMBS. 13-13C)

FIGURE 11 B

LONGITUDINAL LOAD AT WEST GROUND WIRE SUPPORT POINT

DIAGRAM B

IDEALIZED STRESS DIAGRAM FOR INSIDE LONGITUDINAL FACE OF LOADED SUPPORT ARM.



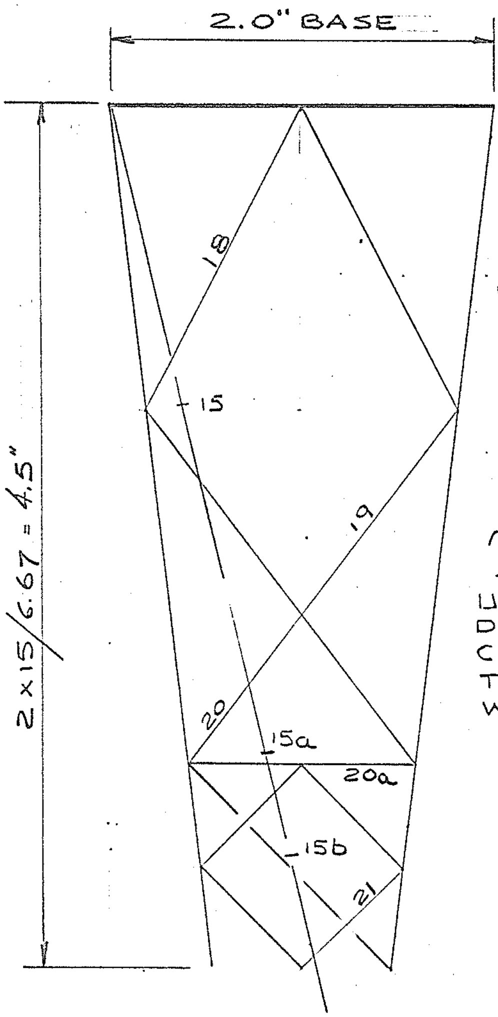


DIAGRAM C

UNIT STRESS DIAGRAM FOR SHEAR APPLIED TO TOWER BODY AT WAIST LEVEL

DIAGRAM D

UNIT STRESS DIAGRAM FOR VERTICAL COUPLE APPLIED TO TOWER BODY AT WAIST LEVEL

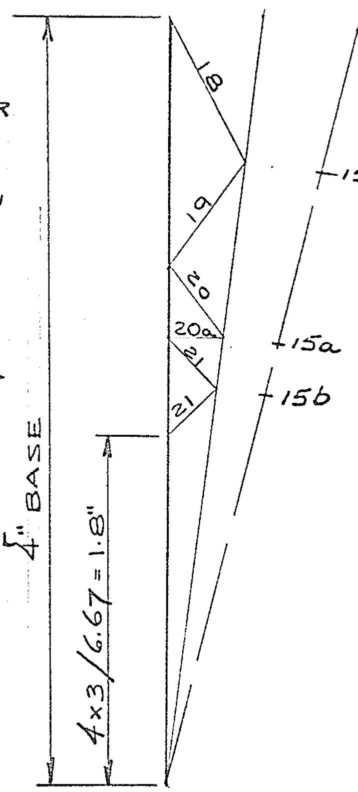


FIGURE 11 C

IDEALIZED STRESS DISTRIBUTION

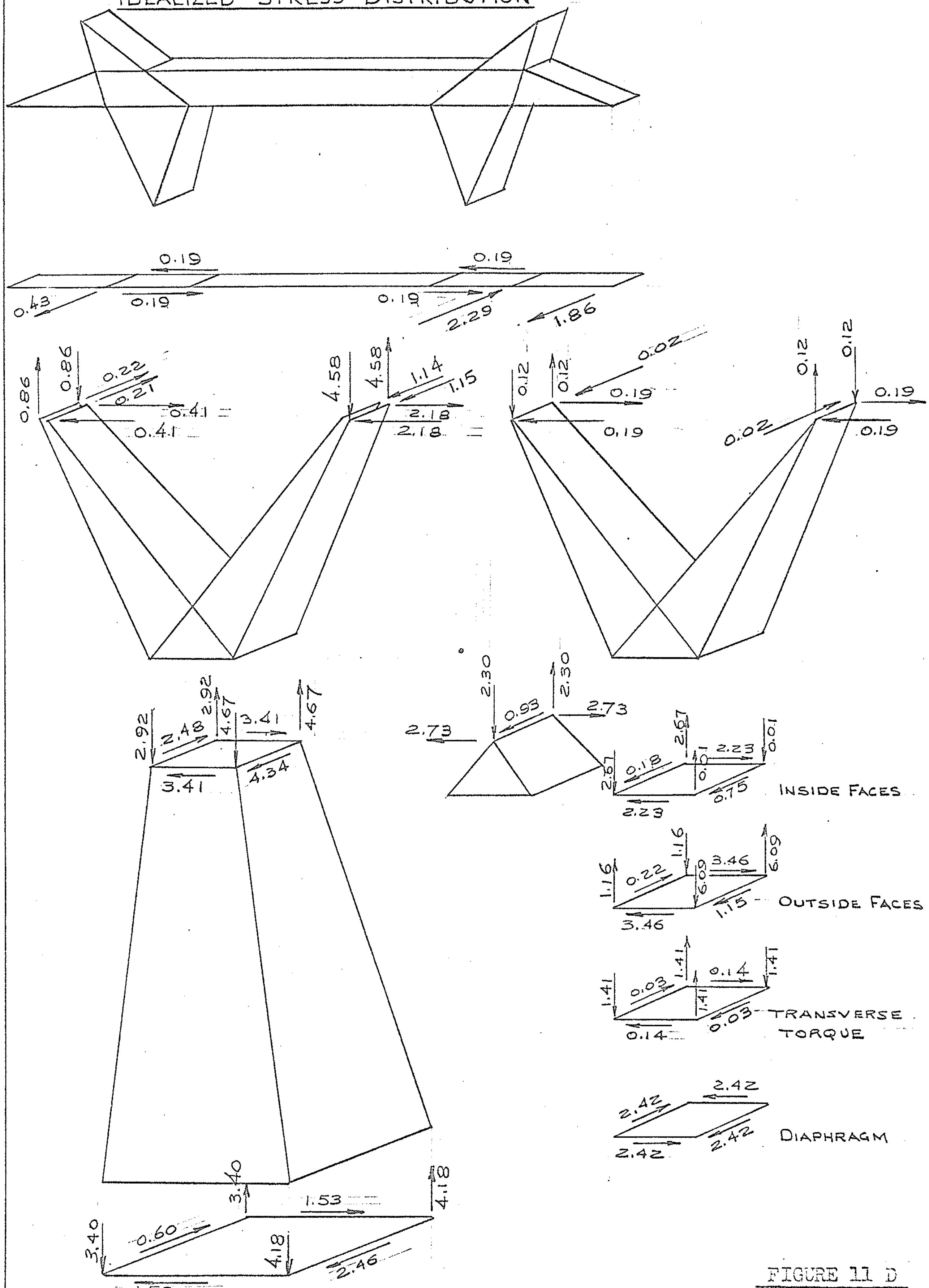


FIGURE 11 D

LONGITUDINAL LOAD AT WEST CONDUCTOR SUSPENSION POINT

IDEALIZED STRESS DIAGRAMS

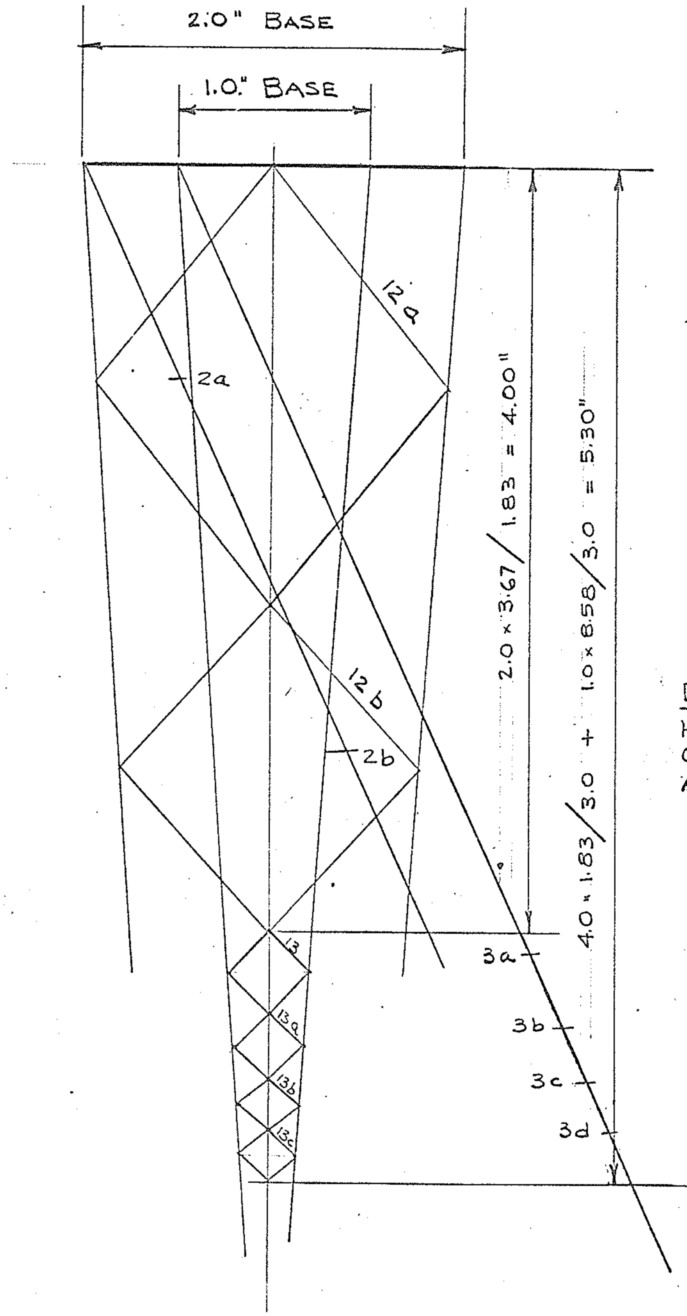


DIAGRAM 'E'

HORIZONTAL SHEAR APPLIED AT TOP OF OUTSIDE FACE UPPER SUPPORT ARM

DIAGRAM 'F'

HORIZONTAL TRANSVERSE SHEAR APPLIED AT SUPPORT POINT (NOT DRAWN - USE DIAGRAM L)

FIGURE 11 E

Longitudinal Load at West Conductor Suspension Point

Idealized Stress Diagrams

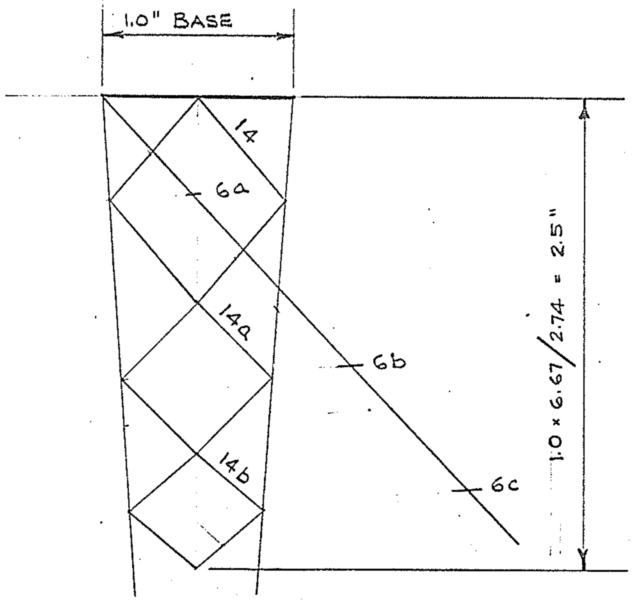
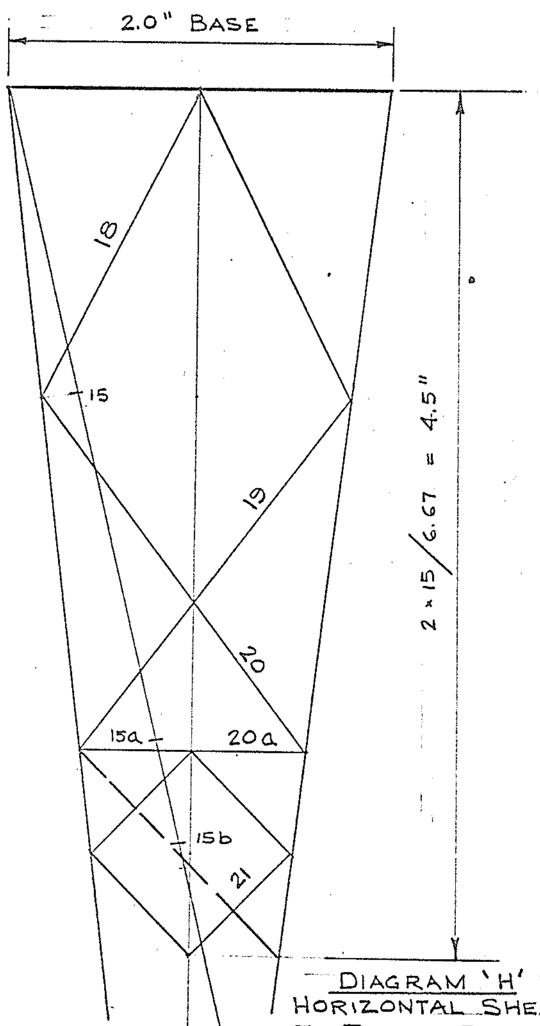


DIAGRAM 'G'
HORIZONTAL SHEAR APPLIED TO INSIDE FACE SUPPORT ARM



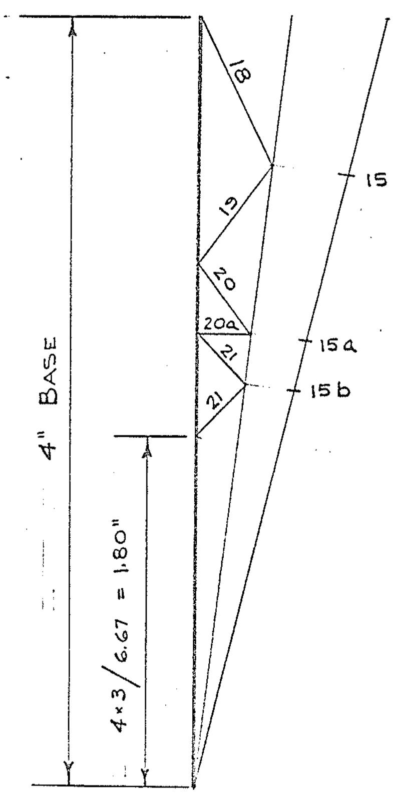


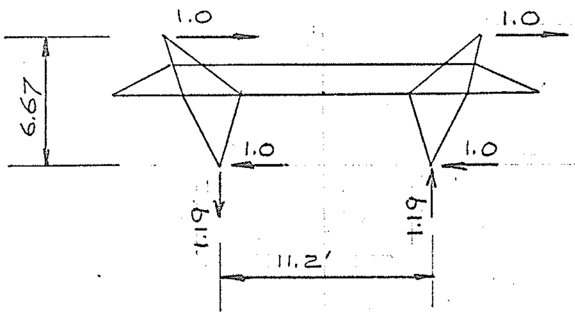
DIAGRAM 'J'
VERTICAL COUPLE APPLIED TO TOWER BODY AT WAIST

DIAGRAM 'H'
HORIZONTAL SHEAR APPLIED TO TOWER BODY AT WAIST

FIGURE 11 F

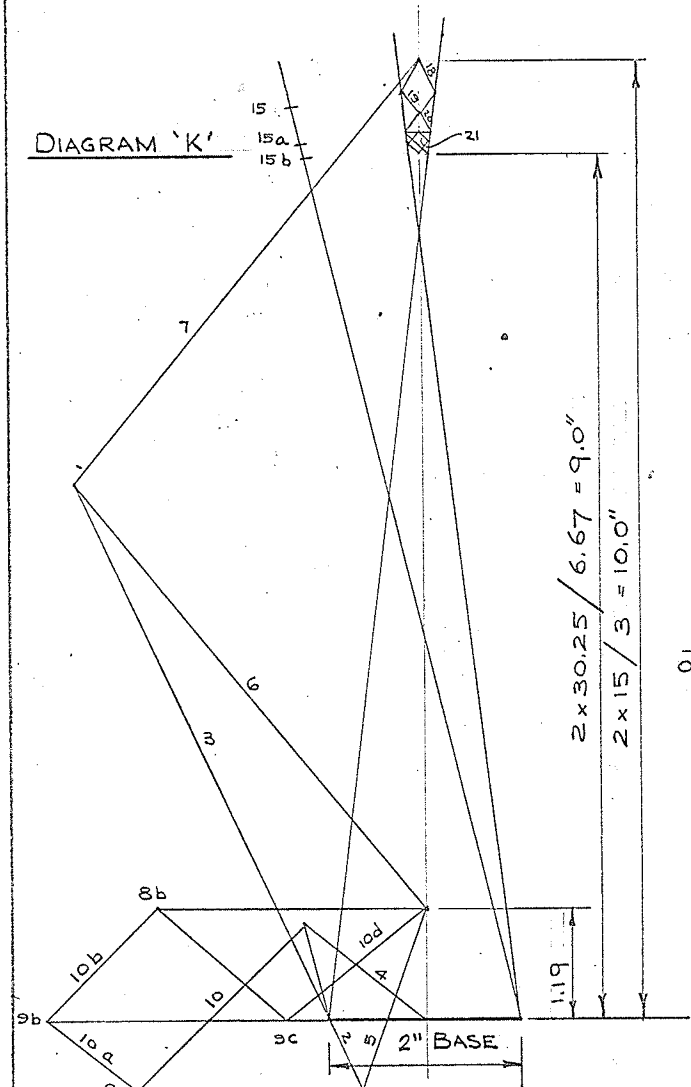
IDEALIZED STRESS DIAGRAMS

TRANSVERSE LOADS AT GROUND WIRE



$$\frac{6.67 \times 2}{11.2} = 1.19$$

DIAGRAM 'K'



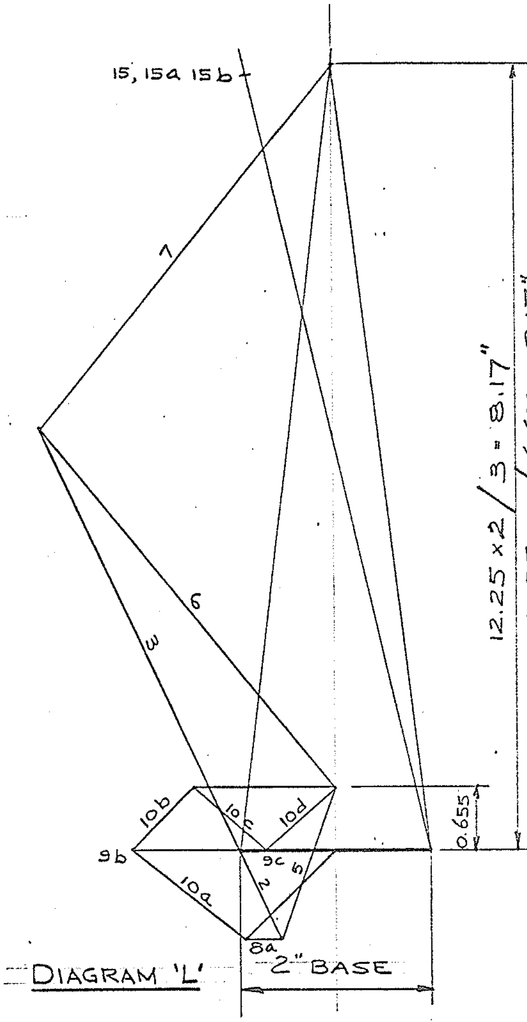
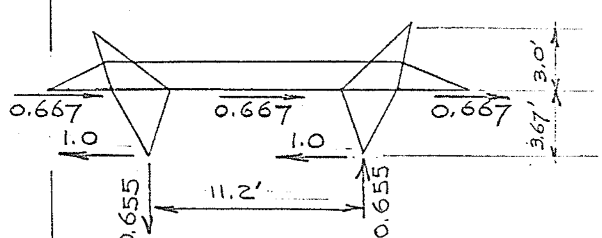


DIAGRAM 'L'

TRANSVERSE LOADS AT CONDUCTORS



$$\frac{3.67 \times 2}{11.2} = 0.655$$

FIGURE 11 G

Description of Member and Gage Group	Longitudinal Load at Ground Wire Point		Longitudinal Load at Conductor Point	
	Measured	Idealized (2.0 kips)	Measured	Idealized (1.86 kips)
* 1a A 13-15	4.15	4.70		
2b B 19-21, B 28-30	7.79	7.22	3.94	3.63
3c C 25-27, C 40-42	7.32	7.92	5.53	5.07
6c C 28-30, C 37-39	2.95	2.50	3.14	2.77
12b B 31-36	0.76	0.76	1.41	1.35
13b C 43-48	0.03	0	0.34	0.37
14b C 31-36	0.44	0.43	0.41	0.50
Waist Diagonals D 21-23, D 24-26	1.46	1.48	1.65	1.71
15 E 10-12, E 19-21	5.70	6.99	4.24	4.58
15b F 10-12, F 19-21	5.10	6.04	3.76	4.38
18 E 13-18	1.77	1.96	2.41	2.98
21 F 13-18	0.82	0.84	1.09	1.26

* For location of members, see Figure 5 A

TABLE XI A

Description of Member and Gage Group		Transverse Load at Ground Wire Point (1.0 kips)		Transverse Load at Conductor Point (2.15 kips)	
		Measured	Idealized	Measured	Idealized
* 1a	A 7-12	0.52	0.53	-	-
2b	B 1-3, B10-12 B19-21,B 28-30	0.10	0.20	0.50	0.55
3c	C 1-3,C 16-18 C 25-27,C 40-42	1.63	1.55	2.36	2.62
6c	C 4-6,C 13-15 C 28-30,C 37-39	1.43	1.43	2.58	2.62
15	E 1-3,E 10-12 E 19-21,E 28-30	2.43	2.44	4.20	4.47
15b	F 1-3,F 10-12 F 19-21,F 28-30	2.36	2.28	4.36	4.47
18	E 4-9,E 22-27	0.12	0.11	0.05	0
21	F 4-9,F 22-27	0.04	0.08	0.07	0

* for location of members, see Figure 5 A

TABLE XI B

CHAPTER XII

CONCLUSION

In conclusion, the above discussed observations and findings may be summarized as follows:

(a) Applying a longitudinal load at the ground wire suspension point on the model tower, it was evident that

(i) The load was transmitted to the support points by both outside longitudinal faces of the upper support arms in relative magnitudes determined by the geometry of the tower.

(ii) At the support points, the shear was shared equally by the two longitudinal faces of the support arms, and the overturning moment was transmitted by the outside longitudinal faces alone.

(iii) At the waist the diaphragm was effective in distributing the torsional shears equally to all four faces of the tower body.

(iv) Below the waist, the longitudinal shear was resisted equally by the two longitudinal faces, and the vertical load applied to the tower body at waist level can be evaluated on the basis of conclusion (ii) above.

(b) Applying a longitudinal load at the outer conductor suspension point, it was evident that

(i) The longitudinal load was shared equally by the outside faces of the two upper support arms; the torsional moment was resisted largely by the outside longitudinal faces and to a lesser degree by the transverse faces of the upper support arm.

(ii) Below the support point, the transmission of load to the tower base was accomplished in a manner similar to that concluded for the longitudinal loading at ground wire suspension point.

(c) Applying transverse loads at either the ground wire or conductor suspension point, it was apparent that all of the load was resisted equally by the two transverse faces of the structure. All of the member loads can be arrived at by employing idealized stress diagrams 'K' and 'L' as shown on Figure 11 G. This verifies conventional design methods since these diagrams are commonly used for transverse load design analysis.

CHAPTER XIII

RECOMMENDATION

The authors were led to believe at the commencement of this project that continued testing and research was to be carried out on the model tower during the next three to five years by other interested individuals. Therefore, many of the preliminary descriptive chapters in this thesis are purposely more detailed than may be necessary, hoping that this information might serve as a basis for, or might be an asset in future research programs.

The following recommendations are included since experience exposed many areas where questions arose and which could not be solved or dealt with in the current program.

(1) The conclusions listed above should be reinforced by future load testing. The nature of these tests should be such that they verify the observed stress distribution and augment the study by determining the variation in stress distribution resulting from a variation in stiffness of the inside and outside faces of the support arms. It would also be of value to assess the effect of a less stiff girder on stress distribution.

(2) Further testing should be limited primarily to longitudinal load application due to its greater degree of indeterminancy as compared to transverse and vertical loading.

(3) It is believed that a determination of accurate tower deflections under load would be of considerable value and should be incorporated into future load testing programs for the purpose of confirmation of stress distribution.

(4) Another area of uncertainty associated with transmission tower design which should be investigated using the model structure is the degree of end restraint offered to the tower members by the rigidity of the connection details.

(5) The lengthy and time consuming task of computing member loads from the strain readings might be condensed into a simple computer program making it possible to obtain the member loads directly from the computer.

(6) Additional strain gages should be added to the diagonals on the inside faces of the upper support arms.

(7) The actual loads applied to the tower structure should be measured accurately by means of load cells, dynamometers or some other device.

(8) Further consideration should be given to devising a means of minimizing the effect of temperature variation on the strain readings. Due to the varying lengths of exposed lead wires (Page 77), it is felt that adding a third lead wire to each gage, which normally is effective in compensating lead wire errors due to temperature variation would not be completely effective (reference 6, page 21).

(9) The test site facilities should be improved to reduce testing time and possibly improve the accuracy of the tests as follows:

(a) Improve means of applying test loads.

(b) Provide site lighting equipment to permit night work hence eliminating the undesirable effect of direct sunlight on strain gages and lead wires.

(c) Set the Data Printer of the Digital Strain Indicator to a slower speed that a reliable automatic recording of strain readings is possible.

(d) Provide for better access from test site to office containing strain measuring and reading equipment.

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APPENDIX A

At conductor suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) incldg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	12. Zero Long. Comb. Trans. Zero	 6 18 6 27 6 37 6 42 6 50
A 1 - A 3	3.	.978		0.12	0.12	0.12												Long.	0.03
	10.		.778							-0.07	-0.05	-0.05		0.07*				Comb.	0.06
	12.			0.12		0.15				-0.05		0.02	0.08	0.14				Trans.	0.07
	Average					0.14						-0.02		0.11	0.12	0.01	7.8	Zero	-0.10
A 4 - A 6	3.	.978		-0.23	-0.22	-0.22												Long.	0.03
	10.		.778							-0.13	-0.10	-0.10		-0.32*				Comb.	0.07
	12.			-0.11		-0.08				-0.13		-0.05	-0.12	-0.05				Trans.	0.08
	Average					-0.15						-0.07		-0.19	-0.22	0.03	16.6	Zero	-0.11
A 7 - A 9	3.	.978		-0.88	-0.86	-0.86												Long.	0.11
	10.		.778							0.30	0.23	0.23		-0.63*				Comb.	0.19
	12.			-0.48		-0.37				0.05		0.33	-0.18	0.01				Trans.	0.29
	Average					-0.62						0.28		-0.31	-0.34	0.03	3.3	Zero	-0.38
A 10 - A 12	3.	.978		0.42	0.41	0.41												Long.	0.10
	10.		.778							0.19	0.15	0.15		0.56*				Comb.	0.20
	12.			0.22		0.32				0.13		0.38	0.47	0.67				Trans.	0.25
	Average					0.37						0.22		0.61	0.59	0.02	3.4	Zero	-0.34

At conductor suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) incldg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	12. Zero Long. Comb. Trans. Zero	 6 18 6 27 6 37 6 42 6 50
A 13 - A 15	3.	.978		-0.42	-0.41	-0.41												Long.	0.04
	10.		.778							0	0	0		-0.41*				Comb.	0.05
	12.			-0.28		-0.24				-0.11		-0.01	-0.21	-0.13				Trans.	0.10
	Average					-0.32						0		-0.27	-0.32	0.05	15.7	Zero	-0.14
A 16 - A 18	3.	.978		-0.21	-0.21	-0.21												Long.	0.03
	10.		.778							-0.02	-0.02	-0.02		-0.23*				Comb.	0.08
	12.			-0.09		-0.06				-0.17		-0.08	-0.15	-0.07				Trans.	0.09
	Average					-0.13						-0.05		-0.15	-0.18	0.03	16.8	Zero	-0.12
A 19 - A 21	3.	.978		-3.07	-3.00	-3.00												Long.	0.03
	10.		.778							-0.51	-0.40	-0.40		-3.40*				Comb.	0.05
	12.			-3.07		-3.04				-0.42		-0.35	-3.12	-3.07				Trans.	0.07
	Average					-3.02						-0.37		-3.24	-3.39	0.15	4.4	Zero	-0.09
A 22 - A 24	3.	.978		3.25	3.17	3.17												Long.	
	10.		.778							-0.60	-0.47	-0.47		2.70*				Comb.	0.01
	12.			3.91		3.91				-0.43		-0.42	3.30	3.31				Trans	0.01
	Average					3.54						-0.44		3.01	3.10	0.09	2.3	Zero	-0.02

At conductor suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) incldg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	14. Zero Long. Comb. Trans. Zero	 5 55 6 13 6 28 6 35 6 40
D 9 - D 11	24.	.919		-1.06	-0.97	-0.97												Long.	-0.12
	9.		.778							-0.17	-0.13	-0.13		-1.10*				Comb.	-0.21
	14.			-0.90		-1.02				0.02		-0.24	-1.15	-1.36				Trans.	-0.26
	Average					-1.00						-0.18		-1.23	-1.18	-0.05	4.2	Zero	0.29
D 12 - D 14	24.	.919		0.13	0.12	0.12												Long.	-0.09
	9.		.778							-0.22	-0.17	-0.17		-0.05*				Comb.	-0.16
	14.			0		-0.09				-0.04		-0.24	-0.17	-0.33				Trans.	-0.20
	Average					0.02						-0.20		-0.19	-0.18	-0.01	4.6	Zero	0.22
D 15 - D 17	24.	.919		0.54	0.50	0.50												Long.	-0.12
	9.		.778							0	0	0		0.50*				Comb.	-0.21
	14.			0.54		0.42				0.39		0.13	0.87	0.66				Trans.	-0.26
	Average					0.46						0.06		0.58	0.52	0.04	7.7	Zero	0.30
D 18 - D 20	24.	.919		-0.12	-0.11	-0.11												Long.	-0.07
	9.		.778							0.07	0.05	0.05		-0.06*				Comb.	-0.13
	14.			-0.05		-0.12				0.23		0.07	0.07	-0.06				Trans	-0.16
	Average					-0.12						0.06		-0.06	-0.06	0	0	Zero	0.18

At conductor suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) incldg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	14. Zero Long. Comb. Trans. Zero	 5 55 6 13 6 28 6 35 6 40
D 21 - D 23	24.	.919		2.11	1.94	1.94												Long.	0.02
	9.		.778							-0.11	-0.09	-0.09		1.85*				Comb.	0.04
	14.			1.87		1.89				-0.04		0	1.88	1.92				Trans.	0.04
	Average					1.91						-0.04		1.89	1.87	0.02	1.0	Zero	-0.05
D 24 - D 26	24.	.919		-1.53	-1.41	-1.41												Long.	-0.07
	9.		.778							0.02	0.02	0.02		-1.39*				Comb.	-0.13
	14.			-1.29		-1.36				0.26		0.10	-1.09	-1.22				Trans	-0.16
	Average					-1.39						0.06		-1.31	-1.33	-0.02	1.4	Zero	0.18
																		Long.	
																		Comb.	
																		Trans.	
	Average																	Zero	
																		Long.	
																		Comb.	
																		Trans	
	Average																	Zero	

SUMMARY OF MEMBER LOADS

At conductor suspension point: Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	Longitudinal Load Tests (a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	Transverse Load Tests (e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	Combined Load Tests (h) Uncorrected reading	(j) (h) incl. time FINAL	For Comparison (k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections: Zero 7 24, Long. 7 35, Comb. 7 40, Trans. 7 48, Zero 8 04	12.
B 1 - B 3	3.	.978		1.30	1.27	1.27												Long.	-0.07
	10.		.778							-0.57	-0.44	-0.44		0.83*				Comb.	-0.10
	12.			1.37		1.30				-0.01		-0.15	0.99	0.89				Trans.	-0.14
	Average					1.28						-0.30		0.86	0.98	0.12	7.6	Zero	0.24
B 4 - B 6	3.	.978		-0.30	-0.29	-0.29												Long.	-0.05
	10.		.778							1.06	0.82	0.82		0.53*				Comb.	-0.09
	12.			-0.11		-0.16				1.00		0.87	0.70	0.61				Trans.	-0.13
	Average					-0.23						0.84		0.57	0.61	0.04	3.7	Zero	0.21
B 7 - B 9	3.	.978		0.55	0.54	0.54												Long.	-0.04
	10.		.778							1.04	0.81	0.81		1.35*				Comb.	-0.06
	12.			0.42		0.38				1.03		0.95	1.46	1.40				Trans.	-0.08
	Average					0.46						0.88		1.37	1.34	0.03	2.2	Zero	0.14
B 10 - B 12	3.	.978		-0.92	-0.90	-0.90												Long.	-0.08
	10.		.778							-0.62	-0.48	-0.48		-1.28*				Comb.	-0.12
	12.			-0.68		-0.76				-0.13		-0.31	-1.03	-1.15				Trans	-0.18
	Average					-0.83						-0.40		-1.22	-1.23	0.01	0.8	Zero	0.30
B 13 - B 15	3.	.978		- 0.16	-0.16	-0.16												Long.	-0.05
	10.		.778							-0.07	-0.05	-0.05		-0.21*				Comb.	-0.07
	12.			-0.16		-0.21				0.14		0.04	-0.18	-0.25				Trans.	-0.10
	Average					-0.19						-0.01		-0.23	-0.20	0.03	15.0	Zero	0.17
B 16 - B 18	3.	.978		0.33	0.32	0.32												Long.	-0.04
	10.		.778							-0.09	-0.07	-0.07		0.25*				Comb.	-0.06
	12.			0.38		0.34				0.12		0.04	0.31	0.27				Trans.	-0.08
	Average					0.33						-0.02		0.26	0.31	0.05	14.0	Zero	0.14
B 19 - B 21	3.	.978		-3.35	-3.28	-3.28												Long.	-0.08
	10.		.778							0.77	0.60	0.60		-2.68*				Comb.	-0.12
	12.			-3.08		-3.16				1.05		0.87	-2.13	-2.25				Trans.	-0.18
	Average					-3.22						0.73		-2.46	-2.49	-0.03	0.8	Zero	0.30
B 22 - B 24	3.	.978		0.47	0.46	0.46												Long.	-0.05
	10.		.778							-1.23	-0.96	-0.96		-0.50*				Comb.	-0.07
	12.			0.46		0.41				-0.64		-0.74	-0.48	-0.55				Trans	-0.10
	Average					0.43						-0.85		-0.52	-0.42	-0.10	7.8	Zero	0.17
B 25 - B 27	3.	.978		-0.23	-0.23	-0.23												Long.	-0.05
	10.		.778							-1.03	-0.80	-0.80		-1.03*				Comb.	-0.08
	12.			0.03		-0.02				-0.37		-0.48	-0.59	-0.67				Trans.	-0.11
	Average					-0.12						-0.64		-0.85	-0.76	0.09	11.8	Zero	0.19
B 28 - B 30	3.	.978		4.55	4.45	4.45												Long.	-0.06
	10.		.778							0.70	0.55	0.55		5.00*				Comb.	-0.09
	12.			4.92		4.86				0.60		0.47	4.83	4.74				Trans.	-0.13
	Average					4.66						0.51		4.87	5.17	0.30	5.8	Zero	0.22
B 31 - B 33	3.	.978		0.80	0.78	0.78												Long.	-0.04
	10.		.778							0.06	0.05	0.05		0.83*				Comb.	-0.05
	12.			0.91		0.87				0.24		0.16	0.93	0.88				Trans.	-0.08
	Average					0.82						0.10		0.86	0.92	0.06	6.4	Zero	0.13
B 34 - B 36	3.	.978		-1.96	-1.91	-1.91												Long.	-0.03
	10.		.778							0.10	0.08	0.08		-1.83*				Comb.	-0.04
	12.			-2.06		-2.09				0.26		0.19	-1.93	-1.97				Trans	-0.07
	Average					-2.00						0.14		-1.90	-1.86	0.04	1.9	Zero	0.11

SUMMARY OF MEMBER LOADS

Time Corrections	12.	14.
Zero	8 32	5 55
Long.	8 42	6 13
Comb.	8 54	6 28
Trans.	9 07	6 35
Zero	9 17	6 40

At conductor suspension point: Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	Longitudinal Load Tests (a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclдg. time correct	Load Portion: From transv. component	From vertic. component	(d) FINAL	Transverse Load Tests (e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	Combined Load Tests (h) Uncorrected reading	(j) (h) incl. time FINAL	For Comparison (k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections	12.	14.
c 1 - c 3	3.	.978		-0.03	-0.03	-0.03												Long.	-0.02	
	9.		.778							3.58	2.79	2.79		2.76*				Comb.	-0.05	
	12.			-0.62		+0.60				2.81		2.73	2.99	2.94				Trans.	-0.08	
	Average					-0.28						2.76		2.85	3.04	0.19	6.3	Zero	0.12	
c 16 - c 18	3.	.978		-0.12	-0.12	-0.12												Long.	-0.02	
	9.		.778							2.42	1.88	1.88		1.76*				Comb.	-0.04	
	12.			-0.12		-0.14				1.80		1.74	1.58	1.54				Trans.	-0.06	
	Average					-0.13						1.81		1.65	1.68	0.03	1.6	Zero	0.08	
c 25 - c 27	3.	.978		-5.52	-5.40	-5.40												Long.	-0.03	
	9.		.778							-3.50	-2.72	-2.72		-8.12*				Comb.	-0.07	
	14.			-5.36		-5.39				-2.57		-2.67	-8.19	-8.26				Trans.	-0.10	
	Average					-5.39						-2.69		-8.19	-8.08	-0.11	1.4	Zero	0.14	
c 40 - c 42	24.	.919		6.13	5.62	5.62												Long.	-0.18	
	9.		.778							-3.58	-2.79	-2.79		2.83*				Comb.	-0.33	
	14.			5.90		5.72				-1.93		-2.33	3.55	3.22				Trans	-0.40	
	Average					5.67						-2.56		3.04	3.11	0.07	0.9	Zero	0.46	

Time Corrections	12.
Zero	8 32
Long.	8 42
Comb.	8 54
Trans.	9 07
Zero	9 17

At conductor suspension point: Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	Longitudinal Load Tests (a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclдg. time correct	Load Portion: From transv. component	From vertic. component	(d) FINAL	Transverse Load Tests (e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	Combined Load Tests (h) Uncorrected reading	(j) (h) incl. time FINAL	For Comparison (k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections	12.
c 4 - c 6	3.	.978		1.43	1.40	1.40												Long.	-0.01
	9.		.778							-3.05	-2.37	-2.37		-0.97*				Comb.	-0.03
	12.			1.42		1.41				-2.33		-2.38	-1.01	-1.04				Trans.	-0.05
	Average					1.40						-2.37		-1.00	-0.97	-0.03	0.8	Zero	0.06
c 7 - c 9	3.	.978		-0.03	-0.03	-0.03												Long.	
	9.		.778							-0.05	-0.04	-0.04		-0.07*				Comb.	-0.01
	12.			0.06		0.06				-0.04		-0.05	-0.02	-0.03				Trans.	-0.01
	Average					0.01						-0.05		-0.05	-0.04	-0.01	Small reading	Zero	0.03
c 10 - c 12	3.	.978		-0.03	-0.03	-0.03												Long.	-0.02
	9.		.778							-0.22	-0.17	-0.17		-0.20*				Comb.	-0.04
	12.			0.03		0.01				-0.08		-0.14	-0.12	-0.16				Trans.	-0.06
	Average					-0.01						-0.16		-0.18	-0.17	-0.01	6.0	Zero	0.08
c 13 - c 15	3.	.978		-1.58	-1.54	-1.54												Long.	-0.03
	9.		.778							-3.51	-2.73	-2.73		-4.27*				Comb.	-0.07
	12.			-1.04		-1.07				-2.66		-2.77	-3.97	-4.00				Trans	-0.11
	Average					-1.32						-2.75		-4.14	-4.08	0.06	1.5	Zero	0.15

Time Corrections	12.
Zero	8 32
Long.	8 42
Comb.	8 54
Trans.	9 07
Zero	9 17

At conductor suspension point: Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	Longitudinal Load Tests (a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclдg. time correct	Load Portion: From transv. component	From vertic. component	(d) FINAL	Transverse Load Tests (e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	Combined Load Tests (h) Uncorrected reading	(j) (h) incl. time FINAL	For Comparison (k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections	12.
c 19 - c 21	3.	.978		-0.18	-0.18	-0.18												Long.	
	9.		.778							-0.01	-0.01	-0.01		-0.19*				Comb.	-0.01
	12.			-0.09		-0.09				-0.05		-0.06	-0.13	-0.14				Trans.	-0.01
	Average					-0.14						-0.03		-0.16	-0.17	-0.01	6.0	Zero	0.02
c 22 - c 24	3.	.978		-0.01	-0.01	-0.01												Long.	
	9.		.778							0.16	0.12	0.12		0.11*				Comb.	-0.01
	12.			0.05		0.04				0.15		0.14	0.18	0.17				Trans.	-0.01
	Average					0.01						0.13		0.14	0.14	0	0	Zero	0.02
c 28 - c 30	3.	.978		-3.36	-3.29	-3.29												Long.	-0.01
	9.		.778							3.83	2.98	2.98		-0.31*				Comb.	-0.02
	12.			-3.28		-3.29				3.05		3.01	0.04	0.02				Trans.	-0.04
	Average					-3.29						3.00		0.13	-0.29	0.42	6.7	Zero	0.05
c 31 - c 33	3.	.978		-0.42	-0.41	-0.41												Long.	
	9.		.778							0.17	0.13	0.13		-0.23*				Comb.	-0.01
	12.			-0.35		-0.35				0.18		0.17	-0.18	-0.17				Trans	-0.01
	Average					-0.38						0.15		-0.22	-0.23	0.01	1.9	Zero	0.02

Time Corrections	12.	14.
Zero	8 32	5 55
Long.	8 42	6 13
Comb.	8 54	6 28
Trans.	9 07	6 35
Zero	9 17	6 40

At conductor suspension point: Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	Longitudinal Load Tests (a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclдg. time correct	Load Portion: From transv. component	From vertic. component	(d) FINAL	Transverse Load Tests (e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	Combined Load Tests (h) Uncorrected reading	(j) (h) incl. time FINAL	For Comparison (k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections	12.	14.
c 34 - c 36	3.	.978		0.37	0.36	0.36												Long.	-0.01	
	9.		.778							0.06	0.05	0.05		0.41*				Comb.	-0.02	
	12.			0.52		0.51				0.07		0.04	0.51	0.49				Trans.	-0.03	
	Average					0.43						0.04		0.45	0.47	0.02	4.0	Zero	0.04	
c 37 - c 39	3.	.978		2.84	2.78	2.78												Long.	-0.01	
	9.		.778							3.05	2.37	2.37		5.15*				Comb.	-0.03	
	12.			3.18		3.17				2.04		1.99	5.21	5.18				Trans.	-0.05	
	Average					2.98						2.18		5.16	5.16	0	0	Zero	0.07	
c 43 - c 45	24.	.919		0.12	0.11	0.11												Long.	-0.03	
	9.		.778							0	0	0		0.11*				Comb.	-0.05	
	14.			0.15		0.12				0.05		-0.01	0.20	0.15				Trans.	-0.06	
	Average					0.12						0		0.13	0.12	0.01	8.5	Zero	0.07	
c 46 - c 48	24.	.919		-0.63	-0.58	-0.58												Long.	-0.02	
	9.		.778							0.02	0.02	0.02		-0.56*				Comb.	-0.04	
	14.			-0.50		-0.52				0.06		0.01	-0.47	-0.51				Trans	-0.05	
	Average					-0.55						0.01		-0.54	-0.54	0	0	Zero	0.06	

SUMMARY OF MEMBER LOADS

At conductor suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage Group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) incldg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Zero Long. Comb. Trans. Zero	14. 7 15 7 28 7 36 7 45 7 55
E 1 - E 3	5.	.978		-2.89	-2.83	-2.83												Long.	-0.09
	9.		,778							5.53	4.31	4.31		1.48*				Comb.	-0.15
	14.			-2.68		-2.77				4.85		4.64	2.39	2.24				Trans.	-0.21
	Average					-2.80						4.47		1.86	1.67	0.21	2.9	Zero	0.28
E 10 - E 12	5.	.978		-3.97	-3.88	-3.88												Long.	-0.04
	9.		.778							-5.35	-4.17	-4.17		-8.05*				Comb.	-0.06
	14.			-4.18		-4.22				-4.25		-4.34	-8.77	-8.83				Trans.	-0.09
	Average					-4.05						-4.25		-8.44	-8.30	-0.14	1.7	Zero	0.12
E 19 - E 21	5.	.978		4.44	4.34	4.34												Long.	-0.07
	9.		.778							-5.36	-4.17	-4.17		0.17*				Comb.	-0.12
	14.			4.60		4.53				-3.73		-3.90	0.76	0.64				Trans.	-0.17
	Average					4.43						-4.03		0.40	0.40	0	0	Zero	0.22
E 28 - E 30	5.	.978		2.82	2.76	2 .76												Long.	-0.06
	9.		.778							5.43	4.22	4.22		6.98*				Comb.	-0.10
	14.			2.59		2.53				4.03		3.89	6.28	6.18				Trans	-0.14
	Average					2.65						4.05		6.58	6.70	0.12	1.8	Zero	0.19

At conductor suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage Group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) incldg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Zero Long. Comb. Trans. Zero	14. 7 15 7 28 7 36 7 45 7 55
E 4 - E 6	5.	.978		2.92	2.83	2.83												Long.	-0.04
	9.		.778							-0.03	-0.02	-0.02		2.81*				Comb.	-0.07
	14.			2.97		2.93				0.08		-0.02	2.79	2.71				Trans.	-0.10
	Average					2.88						-0.02		2.76	2.86	0.10	3.4	Zero	0.13
E 7 - E 9	5.	.978		-2.98	-2.91	-2.91												Long.	-0.01
	9.		.778							0.14	0.11	0.11		-2.80*				Comb.	-0.02
	14.			-3.04		-3.05				0.07		0.05	-2.72	-2.74				Trans.	-0.02
	Average					-2.98						0.08		-2.77	-2.90	-0.13	4.2	Zero	0.03
E 13 - E 15	5.	.978		2.51	2.45	2.45												Long.	-0.01
	9.		.778							-0.03	-0.02	-0.02		2.43*				Comb.	-0.02
	14.			2.40		2.39				-0.08		-0.11	2.40	2.38				Trans.	-0.03
	Average					2.43						-0.06		2.40	2.37	0.03	1.2	Zero	0.04
E 16 - E 18	5.	.978		-2.38	-2.33	-2.33												Long.	-0.03
	9.		.778							-0.03	-0.02	-0.02		-2.35*				Comb.	-0.05
	14.			-2.42		-2.45				0.06		-0.01	-2.50	-2.57				Trans	-0.07
	Average					-2.39						-0.01		-2.46	-2.40	-0.06	2.5	Zero	0.09

At conductor suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage Group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) incldg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Zero Long. Comb. Trans. Zero	14. 7 15 7 28 7 36 7 45 7 55
E 22 - E 24	5.	.978		2.97	2.90	2.90												Long.	-
	9.		.778							-0.01	-0.01	-0.01		2.89*				Comb.	-0.01
	14.			3.17		3.17				0.01		-0.01	2.80	2.79				Trans.	-0.02
	Average					3.03						-0.01		2.84	3.02	0.22	7.2	Zero	0.02
E 25 - E 27	5.	.978		-2.78	-2.72	-2.72												Long.	-0.02
	9.		.778							0.21	0.16	0.16		-2.56*				Comb.	-0.03
	14.			-2.91		-2.93				0.10		0.05	-2.63	-2.66				Trans.	-0.05
	Average					-2.82						0.10		-2.61	-2.72	-0.11	4.2	Zero	0.06
E 31 - E 33	5.	.978		2.38	2.33	2.33												Long.	-0.02
	9.		.778							0.10	0.08	0.08		2.41*				Comb.	-0.03
	14.			2.34		2.32				0.06		0.02	2.40	2.37				Trans.	-0.04
	Average					2.32						0.05		2.39	2.37	0.02	0.9	Zero	0.05
E 34 - E 36	5.	.978		-2.24	-2.19	-2.19												Long.	-0.04
	9.		.778							0.26	0.20	0.20		-1.99*				Comb.	-0.06
	14.			-2.33		-2.37				0.33		0.21	-2.10	-2.16				Trans	-0.09
	Average					-2,28						0.20		-2.07	-2.08	-0.01	0.4	Zero	0.12

SUMMARY OF MEMBER LOADS

Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) incldg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections	14.
																		Zero Long. Comb. Trans. Zero	8 26 8 33 8 47 8 53 9 07
F 1 - F 3	5.	.978		-3.48	-3.40	-3.40				5.92	4.61	4.61		1.21*				Long.	-0.07
	9.		.778							5.17		4.92	1.48	1.34				Comb.	-0.14
	14.			-3.87		-3.94												Trans.	-0.25
	Average					-3.67						4.77		1.27	1.10	0.17	2.0	Zero	0.38
F 10 - F 12	5.	.978		-3.55	-3.47	-3.47												Long.	-0.04
	9.		.778							-5.46	-4.25	-4.25		-7.72*				Comb.	-0.11
	14.			-3.39		-3.43				-3.97		-4.11	-8.72	-8.83				Trans.	-0.14
	Average					-3.45						-4.18		-8.27	-7.63	-0.64	8.4	Zero	0.22
F 19 - F 21	5.	.978		3.92	3.83	3.83												Long.	-0.03
	9.		.778							-5.91	-4.60	-4.60		-0.77*				Comb.	-0.09
	14.			4.35		4.32				-4.05		-4.16	0.94	0.85				Trans.	-0.11
	Average					4.07						-4.38		0.04	-0.31	-0.35	4.1	Zero	0.17
F 28 - F 30	5.	.978		3.44	3.36	3.36												Long.	-0.09
	9.		.778							5.57	4.34	4.34		7.70*				Comb.	-0.27
	14.			3.64		3.55				4.51		4.16	7.35	7.08				Trans	-0.35
	Average					3.45						4.25		7.39	7.67	0.28	3.6	Zero	0.53

Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) incldg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections	14.
																		Zero Long. Comb. Trans. Zero	8 26 8 31 8 47 8 53 9 03
F 4 - F 6	5.	.978		-0.84	-0.82	-0.82											Combined action of members explained in the discussion	Long.	-0.01
	9.		.778							-0.01	-0.01	-0.01		-0.83*				Comb.	-0.03
	14.			-0.78		-0.79				0.15		0.12	-0.05	-0.08				Trans.	-0.03
	Average					-0.80						0.05		-0.46	-0.75	-0.29		Zero	0.06
F 7 - F 9	5.	.978		1.42	1.39	1.39												Long.	-0.01
	9.		.778							-0.17	-0.13	-0.13		1.26*				Comb.	-0.03
	14.			1.29		1.28				-0.07		-0.10	1.79	1.76				Trans.	-0.03
	Average					1.33						-0.11		1.56	1.22	0.34		Zero	0.06
F 13 - F 15	5.	.978		-1.26	-1.23	-1.23												Long.	-0.01
	9.		.778							-0.25	-0.19	-0.19		-1.42*				Comb.	-0.04
	14.			-1.30		-1.31				-0.44		-0.49	-1.78	-1.82				Trans.	-0.05
	Average					-1.27						-0.34		-1.62	-1.61	0.01	0.6	Zero	0.08
F 16 - F 18	5.	.978		0.96	0.94	0.94												Long.	-0.01
	9.		.778							-0.14	-0.11	-0.11		0.83*				Comb.	-0.04
	14.			0.86		0.85				-0.71		-0.76	0.30	0.26				Trans	-0.05
	Average					0.90						-0.43		0.54	0.47	0.07	5.2	Zero	0.09

Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) incldg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections	14.
																		Zero Long. Comb. Trans. Zero	8 26 8 31 8 47 8 53 9 03
F 22 - F 24	5.	.978		-0.99	-0.97	-0.97												Long.	-0.01
	9.		.778							-0.04	-0.03	-0.03		-1.00*				Comb.	-0.02
	14.			-1.02		-1.03				0.35		0.33	-1.05	-1.07				Trans.	-0.02
	Average					-1.00						0.15		-1.03	-0.85	0.18	15.6	Zero	0.04
F 25 - F 27	5.	.978		1.31	1.28	1.28												Long.	-0.02
	9.		.778							0.44	0.34	0.34		1.62*				Comb.	-0.05
	14.			1.37		1.35				0.46		0.39	1.43	1.38				Trans.	-0.07
	Average					1.32						0.36		1.50	1.68	0.18	10.7	Zero	0.12
F 31 - F 33	5.	.978		-0.96	-0.94	-0.94												Long.	-0.01
	9.		.778							-0.16	-0.12	-0.12		-1.06*				Comb.	-0.04
	14.			-0.97		-0.98				-0.14		-0.19	-1.02	-1.06				Trans.	-0.05
	Average					-0.96						-0.15		-1.06	-1.11	0.05	4.4	Zero	0.09
F 34 - F 36	5.	.978		0.90	0.88	0.88												Long.	-0.01
	9.		.778							0.08	0.06	0.06		0.94*				Comb.	-0.04
	14.			0.88		0.87				-0.02		-0.07	0.81	0.77				Trans	-0.05
	Average					0.87						0		0.85	0.87	0.02	2.3	Zero	0.09

SUMMARY OF MEMBER LOADS

At ground wire suspension point: Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	Longitudinal Load Tests (a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclg. time correct	Load Portion: From transv. component	Load Portion: From vertic. component	(d) FINAL	Transverse Load Tests (e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	Combined Load Tests (h) Uncorrected reading	(j) (h) incl. time FINAL	For Comparison (k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections Zero Long. Comb. Trans. Zero	17. 6 27 6 45 6 52 6 58 7 06
A 1 - A 3	7.	.980		-0.04	-0.04	-0.04												Long.	
	8.		.685							0.30	0.21	0.21		0.17*				Comb.	
	17.			0.02		0.02				0.27		0.27	0.25	0.25				Trans.	
	Average					-0.01						0.24		0.21	0.23	0.02	8.0	Zero	0
A 4 - A 6	7.	.980		0.02	0.02	0.02												Long.	
	8.		.685							0.31	0.21	0.21		0.23*				Comb.	
	17.			0.02		0.02				0.22		0.22	0.26	0.26				Trans.	
	Average					0.02						0.21		0.24	0.23	0.01	4.2	Zero	0
A 13 - A 15	7.	.980		-3.97	-3.89	-3.89												Long.	
	8.		.685							-0.29	-0.20	-0.20		-4.09*				Comb.	
	17.			-4.40		-4.40				-0.17		-0.17	-4.47	-4.47				Trans.	
	Average					-4.15						-0.18		-4.28	-4.33	-0.05	1.2	Zero	0
A 16 - A 18	7.	.980		3.35	3.28	3.28												Long.	
	8.		.685							-0.40	-0.27	-0.27		3.01*				Comb.	
	17.			3.57		3.57				-0.33		-0.33	3.15	3.15				Trans	
	Average					3.38						-0.30		3.08	3.08	0	0	Zero	0

At ground wire suspension point: Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	Longitudinal Load Tests (a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclg. time correct	Load Portion: From transv. component	Load Portion: From vertic. component	(d) FINAL	Transverse Load Tests (e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	Combined Load Tests (h) Uncorrected reading	(j) (h) incl. time FINAL	For Comparison (k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections Zero Long. Comb. Trans. Zero	17. 6 27 6 45 6 52 6 58 7 06
A 7 - A 9	7.	.980		0.09	0.09	0.09												Long.	-0.01
	8.		.685							0.74	0.51	0.51		0.60*				Comb.	-0.02
	17.			0.23		0.22				0.64		0.62	0.81	0.79				Trans.	-0.02
	Average					0.15						0.56		0.69	0.71	0.02	2.8	Zero	0.03
A 10 - A 12	7.	.980		0.25	0.24	0.24												Long.	-0.01
	8.		.685							0.57	0.39	0.39		0.63*				Comb.	-0.02
	17.			0.13		0.12				0.62		0.60	0.87	0.85				Trans.	-0.02
	Average					0.18						0.49		0.79	0.67	0.12	18.0	Zero	0.03
A 19 - A 21	7.	.980		0.64	0.63	0.63												Long.	-0.01
	8.		.685							-0.62	-0.43	-0.43		0.20*				Comb.	-0.02
	17.			0.53		0.52				-0.72		-0.74	-0.13	-0.15				Trans.	-0.02
	Average					0.57						-0.58		0.02	0.01	0.01	1.3	Zero	0.03
A 22 - A 24	7.	.980		-0.37	-0.36	-0.36												Long.	
	8.		.685							-0.67	-0.46	-0.46		-0.82*				Comb.	-0.01
	17.			-0.49		-0.49				-0.42		-0.43	-0.90	-0.91				Trans	-0.01
	Average					-0.43						-0.44		-0.87	-0.87	0	0	Zero	0.01

At ground wire suspension point: Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	Longitudinal Load Tests (a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclg. time correct	Load Portion: From transv. component	Load Portion: From vertic. component	(d) FINAL	Transverse Load Tests (e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	Combined Load Tests (h) Uncorrected reading	(j) (h) incl. time FINAL	For Comparison (k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections Zero Long. Comb. Trans. Zero	17. 11 35 11 47 12 00 12 08 12 10
D 9 - D 11	6.	.980		-1.35	-1.32	-1.32												Long.	0.01
	8.		.685							0.02	0.01	0.01		-1.31*				Comb.	0.02
	17.			-1.56		-1.55				-0.15		-0.12	-1.61	-1.59				Trans.	0.03
	Average					-1.43						-0.06		-1.45	-1.49	0.04	2.7	Zero	-0.03
D 12 - D 14	6.	.980		0.11	0.11	0.11											Due to small reading	Long.	0.01
	8.		.685							-0.07	-0.05	-0.05		0.06*				Comb.	0.01
	17.			-0.01		0				-0.15		-0.13	-0.08	-0.07				Trans.	0.02
	Average					0.05						-0.09		-0.01	-0.04			Zero	-0.02
D 15 - D 17	6.	.980		1.31	1.28	1.28												Long.	
	8.		.685							0.15	0.10	0.10		1.18*				Comb.	0.01
	17.			1.15		1.15				0.05		0.06	1.26	1.27				Trans.	0.01
	Average					1.21						0.08		1.22	1.30	0.08	6.2	Zero	-0.01
D 18 - D 20	6.	.980		-0.01	-0.01	-0.01												Long.	
	8.		.685							0.18	0.13	0.13		0.12*				Comb.	0.01
	17.			-0.12		-0.12				0.05		0.06	-0.05	-0.04				Trans	0.01
	Average					-0.06						0.10		0.04	0.04	0	0	Zero	-0.01

At ground wire suspension point: Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	Longitudinal Load Tests (a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclg. time correct	Load Portion: From transv. component	Load Portion: From vertic. component	(d) FINAL	Transverse Load Tests (e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	Combined Load Tests (h) Uncorrected reading	(j) (h) incl. time FINAL	For Comparison (k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections Zero Long. Comb. Trans. Zero	17. 11 35 11 47 12 00 12 08 12 10
D 21 - D 23	6.	.980		1.55	1.52	1.52												Long.	
	8.		.685							0.01	0.01	0.01		1.53*				Comb.	0.01
	17.			1.81		1.81				0.03		0.04	1.85	1.86				Trans.	0.01
	Average					1.66						0.03		1.69	1.69	0	0	Zero	-0.01
D 24 - D 26	6.	.980		-1.34	-1.31	-1.31												Long.	-0.01
	8.		.685							-0.01	-0.01	-0.01		-1.32*				Comb.	-0.01
	17.			-1.18		-1.19				0.07		0.05	-1.14	-1.15				Trans.	-0.02
	Average					-1.25						0.02		-1.23	-1.23	0	0	Zero	0.02
																		Long.	
																		Comb.	
																		Trans.	
	Average																	Zero	
																		Long.	
																		Comb.	
																		Trans	
	Average																	Zero	

SUMMARY OF MEMBER LOADS

Time Corrections, 17.: Zero 1 55; Long. 2 08; Comb. 2 25; Trans. 2 31; Zero 2 38

At ground wire suspension point: Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	Longitudinal Load Tests (a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	Transverse Load Tests (e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	Combined Load Tests (h) Uncorrected reading	(j) (h) incl. time FINAL	For Comparison (k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Time Corrections	17.
B 1 - B 3	7.	.980		-0.29	-0.28	-0.28												Long.	-0.01
	8.		.685							-0.16	-0.11	-0.11		-0.39*				Comb.	-0.02
	17.			0.01		0				0.05		0.02	-0.04	-0.06				Trans.	-0.03
	Average					-0.14						-0.05		-0.22	-0.19	-0.03	15.7	Zero	0.04
B 10 - B 12	7.	.980		-0.21	-0.21	-0.21												Long.	-0.03
	8.		.685							-0.17	-0.12	-0.12		-0.33*				Comb.	-0.07
	17.			-0.10		-0.13				-0.10		-0.18	-0.11	-0.25				Trans.	-0.08
	Average					-0.17						-0.15		-0.29	-0.32	-0.03	9.4	Zero	0.10
B 19 - B 21	7.	.980		-7.10	-6.94	-6.94												Long.	-0.03
	8.		.685							0.43	0.30	0.30		-6.64*				Comb.	-0.06
	17.			-7.45		-7.48				0.38		0.31	-6.82	-6.88				Trans.	-0.07
	Average					-7.21						0.30		-6.76	-6.91	-0.15	2.0	Zero	0.09
B 28 - B 30	7.	.980		7.64	7.48	7.48												Long.	0.01
	8.		.685							-0.10	-0.07	-0.07		7.41*				Comb.	0.02
	17.			8.25		8.26				-0.17		-0.14	7.99	8.01				Trans	0.03
	Average					7.87						-0.10		7.71	7.77	0.06	0.8	Zero	-0.03
B 4 - B 6	7.	.980		-0.39	-0.38	-0.38												Long.	0.01
	8.		.685							0.61	0.42	0.42		0.04*				Comb.	0.01
	17.			-0.20		-0.19				0.45		0.47	0.19	0.20				Trans.	0.02
	Average					-0.28						0.44		0.12	0.16	0.04	5.6	Zero	-0.02
B 7 - B 9	7.	.980		0.57	0.56	0.56												Long.	-0.01
	8.		.685							0.69	0.47	0.47		1.03*				Comb.	-0.01
	17.			0.62		0.61				0.47		0.45	1.14	1.13				Trans.	-0.02
	Average					0.58						0.46		1.08	1.04	0.04	3.5	Zero	0.02
B 22 - B 24	7.	.980		-0.07	-0.07	-0.07												Long.	-0.02
	8.		.685							-0.76	-0.52	-0.52		-0.59*				Comb.	-0.05
	17.			-0.05		-0.07				-0.46		-0.52	-0.55	-0.60				Trans.	-0.06
	Average					-0.07						-0.52		-0.59	-0.59	0	0	Zero	0.07
B 25 - B 27	7.	.980		-0.20	-0.20	-0.20												Long.	-0.02
	8.		.685							-0.64	-0.44	-0.44		-0.64*				Comb.	-0.05
	17.			0.06		0.04				-0.22		-0.28	-0.32	-0.37				Trans	-0.06
	Average					-0.08						-0.36		-0.50	-0.44	-0.06	13.6	Zero	0.07
B 13 - B 15	7.	.980		-0.06	-0.06	-0.06												Long.	
	8.		.685							-0.02	-0.01	-0.01		-0.07*			Small reading	Comb.	-0.01
	17.			-0.02		-0.02				-0.02		-0.03	0	-0.01				Trans.	-0.01
	Average					-0.04						-0.02		-0.04	-0.06	-0.02	33.0	Zero	0.01
B 16 - B 18	7.	.980		-0.03	-0.03	-0.03												Long.	
	8.		.685							-0.05	-0.03	-0.03		-0.06*				Comb.	
	17.			0.03		0.03				-0.04		-0.04	0	0				Trans.	
	Average					0						-0.03		-0.03	-0.03	0	0	Zero	0
B 31 - B 33	7.	.980		0.08	0.08	0.08												Long.	-0.01
	8.		.685							0.03	0.02	0.02		0.10*				Comb.	-0.02
	17.			0.12		0.11				0.09		0.06	0.17	0.15				Trans.	-0.03
	Average					0.10						0.04		0.13	0.14	0.01	7.0	Zero	0.03
B 34 - B 36	7.	.980		-1.39	-1.36	-1.36												Long.	-0.02
	8.		.685							0.04	0.03	0.03		-1.33*				Comb.	-0.03
	17.			-1.47		-1.49				0.06		0.02	-1.42	-1.45				Trans	-0.04
	Average					-1.42						0.02		-1.39	-1.40	-0.01	0.7	Zero	0.05

SUMMARY OF MEMBER LOADS

At ground wire suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclдg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Zero Long. Comb. Trans. Zero	17. 12 30 12 45 12 52 1 03 1 10
c 1 - c 3	6.	.980		-0.85	-0.83	-0.83												Long.	0.02
	8.		.685							2.14	1.47	1.47		0.64*				Comb.	0.03
	17.			-0.61		-0.59				1.80		1.85	0.84	0.87				Trans.	0.05
	Average					-0.71						1.66		0.75	0.95	0.20	8.5	Zero	-0.06
c 16 - c 18	6.	.980		1.34	1.31	1.31												Long.	0.07
	8.		.685							1.40	0.96	0.96		2.27*				Comb.	0.10
	17.			1.16		1.23				0.96		1.11	2.33	2.43				Trans.	0.15
	Average					1.27						1.03		2.35	2.30	0.05	2.2	Zero	-0.18
c 25 - c 27	6.	.980		-7.68	-7.52	-7.52												Long.	0.03
	8.		.685							-2.48	-1.70	-1.70		-9.22*				Comb.	0.04
	17.			-8.00		-7.97				-1.81		-1.74	-9.70	-9.66				Trans.	0.07
	Average					-7.75						-1.72		-9.44	-9.47	0.03	0.3	Zero	-0.08
c 40 - c 42	6.	.980		6.84	6.70	6.70												Long.	-0.01
	8.		.685							-1.84	-1.26	-1.26		5.44*				Comb.	-0.03
	17.			7.10		7.09				-1.63		-1.67	5.43	5.40				Trans	-0.04
	Average					6.90						-1.47		5.42	5.43	0.01	0.2	Zero	0.04

At ground wire suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclдg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Zero Long. Comb. Trans. Zero	17. 12 30 12 45 12 52 1 03 1 10
c 4 - c 6	6.	.980		0.44	0.43	0.43												Long.	0.02
	8.		.685							-1.97	-1.34	-1.34		-0.91*				Comb.	0.02
	17.			0.50		0.52				-1.36		-1.33	-0.92	-0.90				Trans.	0.03
	Average					0.47						-1.33		-0.90	-0.86	-0.04	2.2	Zero	-0.04
c 13 - c 15	6.	.980		-1.33	-1.29	-1.29												Long.	0.03
	8.		.685							-2.32	-1.58	-1.58		-2.87*				Comb.	0.04
	17.			-1.30		-1.27				-1.57		-1.50	-2.99	-2.95				Trans.	0.07
	Average					- 1.28						-1.54		-2.91	-2.82	-0.09	3.2	Zero	-0.08
c 28 - c 30	6.	.980		-2.66	-2.63	-2.63												Long.	0.01
	8.		.685							2.29	1.56	1.56		-1.07*				Comb.	0.01
	17.			-2.63		-2.62				1.86		1.88	-0.83	-0.82				Trans.	0.02
	Average					-2.62						1.72		-0.94	-0.90	-0.04	0.9	Zero	-0.02
c 37 - c 39	6.	.980		3.18	3.12	3.12												Long.	0.02
	8.		.685							1.57	1.08	1.08		4.20*				Comb.	0.03
	17.			3.42		3.44				1.10		1.14	4.42	4.45				Trans	0.04
	Average					3.28						1.11		4.33	4.39	0.06	1.4	Zero	-0.05

At ground wire suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclдg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Zero Long. Comb. Trans. Zero	17. 12 30 12 45 12 52 103 1 10
c 7 - c 9	6.	.980		-0.09	-0.09	-0.09											Due to small reading	Long.	
	8.		.685							-0.08	-0.05	-0.05		-0.14*				Comb.	
	17.			-0.06		-0.06				-0.01		0	-0.14	-0.14				Trans.	0.01
	Average					-0.08						-0.03		-0.14	-0.11	0.03		Zero	-0.01
c 10 - c 12	6.	.980		0.14	0.14	0.14												Long.	
	8.		.685							-0.16	-0.11	-0.11		0.03*				Comb.	
	17.			0.13		0.13				-0.06		-0.06	0.05	0.05				Trans.	
	Average					0.13						-0.08		0.04	0.05	0.01	4.8	Zero	0
c 31 - c 33	6.	.980		-0.35	-0.34	-0.34												Long.	
	8.		.685							0.07	0.05	0.05		-0.29*				Comb.	
	17.			-0.36		-0.36				0.10		0.10	-0.31	-0.31				Trans.	
	Average					-0.35						0.08		-0.30	-0.27	0.03	7.0	Zero	0
c 34 - c 36	6.	.980		0.49	0.48	0.48												Long.	0.01
	8.		.685							0.02	0.01	0.01		0.49*				Comb.	0.02
	17.			0.58		0.59				0.11		0.13	0.55	0.57				Trans	0.02
	Average					0.53						0.07		0.53	0.60	0.07	11.7	Zero	-0.03

At ground wire suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclдg. time correct	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage	Zero Long. Comb. Trans. Zero	17. 12 30 12 45 12 52 1 03 1 10
c 19 - c 21	6.	.980		-0.08	-0.08	-0.08												Long.	
	8.		.685							-0.10	-0.07	-0.07		-0.15*				Comb.	0.01
	17.			-0.07		-0.07				-0.03		-0.02	-0.09	-0.08				Trans.	0.01
	Average					-0.07						-0.04		-0.11	-0.11	0	0	Zero	-0.01
c 22 - c 24	6.	.980		0.15	0.15	0.15												Long.	
	8.		.685							0.06	0.04	0.04		0.19*				Comb.	0.01
	17.			0.17		0.17				0.09		0.10	0.25	0.26				Trans.	0.01
	Average					0.16						0.07		0.22	0.23	0.01	4.3	Zero	-0.01
c 43 - c 45	6.	.980		0.04	0.04	0.04											Small reading	Long.	
	8.		.685							0.05	0.04	0.04		0.08*				Comb.	
	17.			0.01		0.01				-0.03		-0.03	0.05	0.05				Trans.	
	Average					0.03						0.01		0.06	0.04			Zero	0
c 46 - c 48	6.	.980		-0.06	-0.06	-0.06											Small reading	Long.	
	8.		.685							0.04	0.03	0.03		-0.03*				Comb.	
	17.			-0.03		-0.02				-0.02		-0.01	-0.02	0				Trans	0.01
	Average					-0.04						0.01		-0.02	-0.03			Zero	-0.01

SUMMARY OF MEMBER LOADS

At ground wire suspension point				Longitudinal Load Tests (a)	(b)	(c)	Load Portion		(d)	Transverse Load Tests (e)	(f)	(g)	Combined Load Tests (h)	(j)	For Comparison (k)	(m)		Time Corrections	17.	19.
Gage Group	October 1964	Coeff's Longit.	Transv.	Uncorrected readings	(a) x coeff'nt	(b) inclдg. time correct	From transv. component	From vertic. component	FINAL	Uncorrected reading	(e) x coeff'nt	(f) incl. time FINAL	Uncorrected reading	(h) incl. time FINAL	Sum of (c) and (g)	Difference (j) and (k)	Percentage	Zero Long. Comb. Trans. Zero	9 03 9 06 9 24 9 30 9 43	7 24 7 48 7 37 7 57 8 15
F 1 - F 3	6.	.980		-4.42	-4.32	-4.32												Long.	0.04	0
	8.		.685							3.75	2.57	2.57		-1.75*				Comb.	0.25	0
	17.			-4.59		-4.55				2.73		2.41	-1.88	-1.63				Trans.	0.32	0.01
	19.			-4.94		-4.94				2.91		2.90	-1.68	-1.68				Zero	-0.47	-0.02
	Average					-4.60						2.63		-1.69	1.97	0.28	3.9			
F 10 - F 12	6.	.980		-5.26	-5.15	-5.15												Long.	0.03	0
	8.		.685							-3.36	-2.30	-2.30		-7.45*				Comb.	0.19	0
	17.			-5.26		-5.23				-2.94		-2.70	-8.04	-7.85				Trans.	0.24	0.01
	19.			-5.42		-5.42				-2.85		-2.84	-8.17	-8.17				Zero	-0.36	-0.02
	Average					-5.27						-2.61		-7.82	-7.88	-0.06	0.8			
F 19 - F 21	6.	.980		4.88	4.78	4.78												Long.	0.03	-0.01
	8.		.685							-3.36	-2.33	-2.33		2.45*				Comb.	0.19	-0.06
	17.			5.07		5.10				-2.27		-2.03	2.74	2.93				Trans.	0.24	-0.08
	19.			4.90		4.89				-2.33		-2.41	2.73	2.67				Zero	-0.37	0.07
	Average					4.92						-2.26		2.68	2.66	0.02	0.3			
F 28 - F 30	6.	.980		5.08	4.97	4.97												Long.	0.06	0
	8.		.685							3.01	2.06	2.06		7.03*				Comb.	0.42	0.03
	17.			4.99		5.05				1.15		1.70	6.23	6.65				Trans	0.55	0.04
	19.			5.22		5.25				2.00		2.04	7.11	7.14				Zero	-0.81	-0.05
	Average					5.09						1.93		6.94	7.02	0.08	1.1			

At ground wire suspension point				Longitudinal Load Tests (a)	(b)	(c)	Load Portion		(d)	Transverse Load Tests (e)	(f)	(g)	Combined Load Tests (h)	(j)	For Comparison (k)	(m)		Time Corrections	17.
Gage Group	October 1964	Coeff's Longit.	Transv.	Uncorrected readings	(a) x coeff'nt	(b) inclдg. time correct	From transv. component	From vertic. component	FINAL	Uncorrected reading	(e) x coeff'nt	(f) incl. time FINAL	Uncorrected reading	(h) incl. time FINAL	Sum of (c) and (g)	Difference (j) and (k)	Percentage	Zero Long. Comb. Trans. Zero	9 03 9 06 9 24 9 30 9 43
F 4 - F 6	6.	.980		-0.78	-0.76	-0.76												Long.	0.01
	8.		.685							-0.05	-0.03	-0.03		-0.79*				Comb.	0.08
	17.			-0.80		-0.79				-0.07		0.04	-0.88	-0.80				Trans.	0.11
	Average					-0.77						0		-0.79	-0.77	-0.02	2.5	Zero	-0.16
F 7 - F 9	6.	.980		1.17	1.15	1.15												Long.	0.01
	8.		.685							-0.07	-0.05	-0.05		1.10*				Comb.	0.06
	17.			1.01		1.02				-0.17		-0.06	0.97	1.05				Trans.	0.11
	Average					1.08						-0.05		1.07	1.03	0.04	3.5	Zero	-0.16
F 22 - F 24	6.	.980		-0.99	-0.97	-0.97												Long.	0.01
	8.		.685							0.07	0.05	0.05		-0.92*				Comb.	0.07
	17.			-0.92		-0.91				-0.04		0.05	-1.01	-0.94				Trans.	0.09
	Average					-0.94						0.05		-0.93	-0.89	-0.04	4.0	Zero	-0.13
F 25 - F 27	6.	.980		0.85	0.83	0.83												Long.	0.02
	8.		.685							0.14	0.10	0.10		0.93*				Comb.	0.11
	17.			0.98		1.00				-0.16		-0.02	0.76	0.87				Trans	0.14
	Average					0.91						0.04		0.90	0.95	0.05	5.2	Zero	-0.21

At ground wire suspension point				Longitudinal Load Tests (a)	(b)	(c)	Load Portion		(d)	Transverse Load Tests (e)	(f)	(g)	Combined Load Tests (h)	(j)	For Comparison (k)	(m)		Time Corrections	17.
Gage Group	October 1964	Coeff's Longit.	Transv.	Uncorrected readings	(a) x coeff'nt	(b) inclдg. time correct	From transv. component	From vertic. component	FINAL	Uncorrected reading	(e) x coeff'nt	(f) incl. time FINAL	Uncorrected reading	(h) incl. time FINAL	Sum of (c) and (g)	Difference (j) and (k)	Percentage	Zero Long. Comb. Trans. Zero	9 03 9 06 9 24 9 30 9 43
F 13 - F 15	6.	.980		-1.00	-0.98	-0.98												Long.	0.01
	8.		.685							-0.06	-0.04	-0.04		-1.02*				Comb.	0.05
	17.			-1.11		-1.10				-0.02		0.05	-1.26	-1.21				Trans.	0.07
	Average					-1.04						0		-1.11	-1.04	-0.07	6.8	Zero	-0.10
F 16 - F 18	6.	.980		0.69	0.68	0.68												Long.	0.01
	8.		.685							-0.05	-0.03	-0.03		0.65*				Comb.	0.10
	17.			0.53		0.54				-0.20		-0.07	0.30	0.40				Trans.	0.13
	Average					0.61						-0.05		0.52	0.56	0.04	6.0	Zero	-0.19
F 31 - F 33	6.	.980		-0.48	-0.47	-0.47												Long.	0.02
	8.		.685							-0.12	-0.08	-0.08		-0.55*				Comb.	0.13
	17.			-0.77		-0.75				-0.37		-0.20	-0.93	-0.80				Trans.	0.17
	Average					-0.61						-0.14		-0.68	-0.75	-0.07	9.3	Zero	-0.25
F 34 - F 36	6.	.980		1.12	1.10	1.10												Long.	0.02
	8.		.685							-0.02	-0.01	-0.01		1.11*				Comb.	0.12
	17.			0.94		0.96				-0.22		-0.06	0.79	0.91				Trans	0.16
	Average					1.03						-0.02		1.01	1.01	0	0	Zero	-0.23

SUMMARY OF MEMBER LOADS

At ground wire suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections		
Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclg. time correct.	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage		17.	19.
																		Zero	10 50	7 26
																		Long.	10 52	7 30
																		Comb.	11 00	7 37
																		Trans.	11 10	7 42
																		Zero	11 28	7 45
E 1 - E 3	6.	.980		-3.46	-3.40	-3.40												Long.	0.02	
	8.		.685							3.64	2.49	2.49		-0.91*				Comb.	0.10	0.02
	17.			-3.72		-3.70				2.56		2.76	-0.95	-0.85				Trans.	0.20	0.03
	19.			-3.70		-3.69				2.76		2.79	-0.90	-0.88				Zero	-0.38	-0.03
	Average					-3.60						2.68		-0.88	-0.92	-0.04	0.6			
E 10 - E 12	6.	.980		-5.95	-5.93	-5.93												Long.	0.02	0.01
	8.		.685							-3.49	-2.39	-2.39		-8.32*				Comb.	0.08	0.04
	17.			-6.43		-6.41				-2.82		-2.66	-9.08	-9.00				Trans.	0.16	0.07
	19.			-6.62		-6.61				-2.68		-2.61	-9.34	-9.30				Zero	- 0.31	-0.07
	Average					-6.32						-2.55		-8.87	-8.86	-0.01	0.1			
E 19 - E 21	6.	980		4.95	4.85	4.85												Long.	0.02	
	8.		.685							-3.36	-2.30	-2.30		2.55*				Comb.	0.10	0.02
	17.			5.08		5.10				-2.39		-2.19	2.61	2.71				Trans.	0.20	0.04
	19.			5.29		5.29				-2.36		-2.32	2.82	2.84				Zero	-0.40	-0.04
	Average					5.08						-2.27		2.70	2.81	0.11	1.5			
E 28 - E 30	6.	.980		4.70	4.61	4.61												Long.	0.03	0.01
	8.		.685							-3.37	-2.31	2.31		6.92*				Comb.	0.13	0.04
	17.			4.64		4.67				1.76		2.02	6.60	6.73				Trans	0.26	0.07
	19.			4.62		4.63				2.19		2.26	6.93	6.97				Zero	-0.49	-0.09
	Average					4.64						2.20		6.87	6.84	0.03	0.4			

At ground wire suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclg. time correct.	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage		17.
																		Zero	10 50
																		Long.	10 52
																		Comb.	11 00
																		Trans.	11 10
																		Zero	11 28
E 4 - E 6	6.	.980		2.47	2.42	2.42												Long.	0.01
	8.		.685							0.06	0.04	0.04		2.38*				Comb.	0.05
	17			2.58		2.59				-0.13		-0.03	2.47	2.52				Trans.	0.10
	Average					2.50						0		2.45	2.50	0.05	2.0	Zero	-0.19
E 7 - E 9	6.	.980		-2.65	-2.59	-2.59												Long.	0.01
	8.		.685							-0.10	-0.07	-0.07		-2.66*				Comb.	0.04
	17.			-2.86		-2.85				-0.09		-0.01	-2.79	-2.75				Trans.	0.08
	Average					-2.72						-0.04		-2.70	-2.76	-0.06	2.2	Zero	-0.16
E 22 - E 24	6.	.980		2.50	2.45	2.45												Long.	0.01
	8.		.685							-0.30	-0.21	-0.21		2.24*				Comb.	0.05
	17.			2.58		2.59				-0.30		-0.21	2.27	2.32				Trans.	0.09
	Average					2.52						-0.21		2.28	2.31	0.03	1.1	Zero	-0.18
E 25 - E 27	6.	.980		-2.14	-2.10	-2.10												Long.	0.01
	8.		.685							0.28	0.19	0.19		-1.91*				Comb.	0.05
	17.			-2.41		-2.40				0.14		0.25	-2.16	-2.11				Trans	0.11
	Average					-2.25						0.22		-2.01	-2.03	-0.02	0.8	Zero	-0.20

At ground wire suspension point				Longitudinal Load Tests						Transverse Load Tests			Combined Load Tests		For Comparison			Time Corrections	
Gage group	October 1964	Coeff's Longit.	Coeff's Transv.	(a) Uncorrected readings	(b) (a) x coeff'nt	(c) (b) inclg. time correct.	Load Portion From transv. component	Load Portion From vertic. component	(d) FINAL	(e) Uncorrected reading	(f) (e) x coeff'nt	(g) (f) incl. time FINAL	(h) Uncorrected reading	(j) (h) incl. time FINAL	(k) Sum of (c) and (g)	(m) Difference (j) and (k)	Percentage		17.
																		Zero	10 50
																		Long.	10 52
																		Comb.	11 00
																		Trans.	11 10
																		Zero	11 28
E 13 - E 15	6.	.980		1.70	1.66	1.66												Long.	0.01
	8.		.685							-0.10	-0.07	-0.07		1.61*				Comb.	0.05
	17.			1.78		1.79				-0.15		-0.05	1.66	1.71				Trans.	0.10
	Average					1.72						-0.06		1.66	1.66	0	0	Zero	-0.19
E 16 - E 18	6.	.980		-1.75	-1.71	-1.71												Long.	0.01
	8.		.685							-0.14	-0.10	-0.10		-1.81*				Comb.	0.04
	17.			-1.92		-1.91				-0.17		-0.08	-2.05	-2.01				Trans.	0.09
	Average					-1.81						-0.09		-1.91	-1.90	0.01	0.5	Zero	-0.17
E 31 - E 33	6.	.980		2.14	2.09	2.09												Long.	0.01
	8.		.685							0.05	0.03	0.03		2.12*				Comb.	0.06
	17.			2.19		2.20				-0.07		0.05	2.12	2.18				Trans.	0.12
	Average					2.14						0.04		2.15	2.19	0.04	2.0	Zero	- 0.23
E 34 - E 36	6.	.980		-2.02	-1.98	-1.98												Long.	0.01
	8.		.685							0.15	0.10	0.10		-1.88*				Comb.	0.05
	17.			-2.24		-2.23				-0.03		0.07	-2.18	-2.13				Trans	0.10
	Average					-2.10						0.08		-2.00	-2.02	0.02	1.0	Zero	-0.19

SUMMARY OF MEMBER LOADS

APPENDIX B

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 58 °F Room 70 °F Instrument 76 °F	Oct.3rd 1964	Initial Zero Reading 1 30 Load Reading 2 00 Final Zero Reading	Longitudunal load at conductor suspension point Load in Pounds 2305	0, 1, 2

Gage Number	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	004	003	000	002	004	004	005	006	006	006	003	003	002	003	003	001	002	005	004	004	005
Microinches: Load Reading	058	-013	-005	005	012	-077	-042	-014	-032	055	-013	031	-248	070	055	-080	-081	121	-212	-655	750
Microinches: Difference	054	-010	-005	003	008	-081	-047	-020	-038	049	-016	028	-250	067	052	-081	-083	116	-216	-659	745
Kips/in²	1.62	-0.30	-0.15	0.09	0.24	-2.43	-1.41	-0.60	-1.14	1.47	-0.48	0.84	-7.50	2.01	1.56	-2.43	-2.49	3.48	-6.48	-19.77	22.35
Section	1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16		
Coefficients	f_2	f_1	f_0	f_0	f_1	f_2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
	.116	.151	.074	.074	.151	.116	.232	.392	.276	.276	.392	.232	.116	.151	.074	.074	.151	.116	.232	.392	.276
Kips	0.19	-0.05	-0.02	0.01	0.04	-0.28	-0.33	-0.24	-0.31	0.41	-0.19	0.20	-0.87	0.30	0.15	-0.23	-0.38	0.40	-1.50	-7.76	6.19
Actual Load	0.12			-0.23			-0.88			0.42			-0.42			-0.21			-3.07		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 58 °F Room 70 °F Instrument 76 °F	Oct.3rd 1964	Initial Zero Reading 1 30 Load Reading 2 00 Final Zero Reading	Longitudinal load at conductor suspension point Load in Pounds 2305	0, 1, 2

Gage Number	A 22	A 23	A 24
Test Channel	21	22	23
Position of Gage	2	1	0
Microinches: Zero Reading	006	001	004
Microinches: Load Reading	-490	424	345
Microinches: Difference	-496	423	341
Kips/in²	-14.88	12.69	10.23
Section	2½x2½x3/16		
Coefficients	f_2	f_1	f_0
	.276	.392	.232
Kips	-4.11	4.98	2.38
Actual Load	3.25		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 64 °F Room 69 °F Instrument 73 °F	Oct.12th 1964	Initial Zero Reading 6 18 Load Reading 6 27 Final Zero Reading	Longitudinal load at conductor suspension point Load in Pounds 2255	0, 1, 2

Gage Number	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	004	007	005	006	004	005	003	003	003	003	003	003	-003	495	-003	-005	001	-003	-003	-004	000
Microinches: Load Reading	044	004	002	015	017	-051	-023	-007	-019	043	-018	023	-245	599	033	-070	-060	102	-227	-598	660
Microinches: Difference	040	-003	-003	009	013	-056	-026	-010	-022	040	-021	020	-242	104	036	-065	-061	105	-224	-594	660
Kips/in²	1.20	-0.09	-0.09	0.27	0.39	-1.68	-0.78	-0.30	-0.66	1.20	-0.63	0.60	-7.26	3.12	1.08	-1.95	-1.83	3.15	-6.72	-17.82	1980
Section	1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16		
Coefficients	f_2	f_1	f_0	f_0	f_1	f_2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
	.116	.151	.074	.074	.151	.116	.232	.392	.276	.276	.392	.232	.116	.151	.074	.074	.151	.116	.232	.392	.276
Kips	0.14	-0.01	-0.01	0.03	0.06	-0.20	-0.18	-0.12	-0.18	0.33	-0.25	0.14	-0.85	0.47	0.10	-0.18	-0.28	0.37	-1.56	-6.98	5.47
Actual Load	0.12			-0.11			-0.48			0.22			-0.28			-0.09			-3.07		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 64 °F Room 69 °F Instrument 73 °F	Oct.12th 1964	Initial Zero Reading 6 18 Load Reading 6 27 Final Zero Reading	Longitudinal load at conductor suspension point Load in Pounds 2255	0, 1, 2

Gage Number	A 22	A 23	A 24
Test Channel	21	22	23
Position of Gage	2	1	0
Microinches: Zero Reading	-002	001	-001
Microinches: Load Reading	-465	451	349
Microinches: Difference	-463	450	350
Kips/in²	-13.89	13.50	10.50
Section	2½x2½x3/16		
Coefficients	f_2	f_1	f_0
	.276	.392	.232
Kips	-3.83	5.30	2.44
Actual Load	3.91		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 67 °F Room 69 °F Instrument 71 °F	Oct.12th 1964	Initial Zero Reading 6 18 Load Reading 6 37 Final Zero Reading	Combined longitudinal and transverse loads at conductor suspension point Load in Pounds 2255 longit. 2350 transv.	0, 1, 2

Gage Number	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	004	007	005	006	004	005	003	003	003	003	003	003	-003	495	-003	-005	001	-003	-003	-004	000
Microinches: Load Reading	036	-007	017	061	-016	-049	-018	007	-007	043	-004	034	-207	598	008	-082	-050	079	-267	-582	669
Microinches: Difference	032	-014	012	055	-020	-054	-021	004	-010	040	-007	031	-204	103	011	-077	-051	082	-264	-578	669
Kips/in²	0.96	-0.42	0.36	1.65	-0.60	-1.62	-0.63	0.12	-0.30	1.20	-0.21	0.93	-6.12	3.09	0.33	-2.21	-1.53	2.46	-7.92	-17.34	20.07
Section	1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
	.116	.151	.074	.074	.151	.116	.232	.392	.276	.276	.392	.232	.116	.151	.074	.074	.151	.116	.232	.392	.276
Kips	0.11	-0.06	0.03	0.16	-0.09	-0.19	-0.15	0.05	-0.08	0.33	-0.08	0.22	-0.71	0.47	0.03	-0.21	-0.23	0.29	-1.84	-6.82	5.54
Actual Load	0.08			-0.12			-0.18			0.47			-0.21			-0.15			-3.12		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 67 °F Room 69 °F Instrument 71 °F	Oct.12th 1964	Initial Zero Reading 6 18 Load Reading 6 37 Final Zero Reading	Combined longitudinal and transverse loads at conductor suspension point Load in Pounds 2255 longit. 2350 transv.	0, 1, 2

Gage Number	A 22	A 23	A 24
Test Channel	21	22	23
Position of Gage	2	1	0
Microinches: Zero Reading	-002	001	-001
Microinches: Load Reading	-479	430	315
Microinches: Difference	-477	429	316
Kips/in²	-14.31	12.87	9.48
Section	2½x2½x3/16		
Coefficients	f_2	f_1	f_o
	.276	.392	.232
Kips	-3.95	5.05	2.20
Actual Load	3.30		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 65 °F Room 69 °F Instrument 71 °F	Oct.12th 1964	Initial Zero Reading 6 18 Load Reading Final Zero Reading 6 50	Zero control reading Load in Pounds No load	0, 1, 2

Gage Number	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	004	007	005	006	004	005	003	003	003	003	003	003	-003	495	-003	-005	001	-003	-003	-004	000
Microinches: Load Reading	-012	-013	023	051	-026	-024	-046	-009	015	026	-015	-043	001	501	-066	-005	-005	-030	-024	-038	056
Microinches: Difference	-016	-020	018	045	-030	-029	-049	-012	012	023	-018	-046	004	006	-063	000	-006	-027	-021	-034	056
Kips/in²	-0.48	-0.60	0.57	1.35	-0.90	-0.87	-1.47	-0.36	0.36	0.69	-0.54	-1.38	0.12	0.18	-1.89	0	-0.18	-0.81	-0.63	-1.02	1.68
Section	1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
	.116	.151	.074	.074	.151	.116	.232	.392	.276	.276	.392	.232	.116	.151	.074	.074	.151	.116	.232	.392	.276
Kips	-0.06	-0.09	0.05	0.13	-0.14	-0.10	-0.34	-0.14	0.10	0.19	-0.21	-0.32	0.01	0.03	-0.18	0	-0.03	-0.09	-0.15	-0.40	0.46
Actual Load	-0.10			-0.11			-0.38			-0.34			-0.14			-0.12			-0.09		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 65 °F Room 69 °F Instrument 71 °F	Oct.12th 1964	Initial Zero Reading 6 18 Load Reading Final Zero Reading 6 50	Zero control reading Load in Pounds No load	0, 1, 2

Gage Number	A 22	A 23	A 24
Test Channel	21	22	23
Position of Gage	2	1	0
Microinches: Zero Reading	-002	001	-001
Microinches: Load Reading	-030	010	013
Microinches: Difference	-028	009	014
Kips/in²	-0.84	0.27	0.42
Section	2½x2½x3/16		
Coefficients	f_2	f_1	f_o
	.276	.392	.232
Kips	-0.23	0.11	0.10
Actual Load	-0.02		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 50 °F, Room 68 °F, Instrument 72 °F | Date: Oct.10th 1964 | Time: Initial Zero Reading 10 00, Load Reading 10 16, Final Zero Reading | Type of Test Load: Transverse load at three conductor suspension points, Load in Pounds 3022 | Position of Gage: 0, 1, 2

Gage Number	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	-001	-002	-003	-004	-002	-004	-004	-004	-003	-004	-001	-003	-001	499	-001	-002	-003	000	-002	-003	-001
Microinches: Load Reading	-007	-018	005	001	-026	-012	015	011	-004	-034	013	037	008	506	-023	-021	005	-003	-065	-022	017
Microinches: Difference	-006	-016	008	005	-024	-008	019	015	-001	-030	014	040	009	007	-022	-019	008	-003	-063	-019	018
Kips/in^2	-0.18	-0.48	0.24	0.15	-0.72	-0.24	0.57	0.45	-0.03	-0.90	0.42	1.20	0.27	0.21	-0.66	-0.57	0.24	-0.09	-1.89	-0.57	0.54
Section	1½x1½x⅛			1½x1½x⅛			2½x2½x3/16			2½x2½x3/16			1½x1½x⅛			1½x1½x⅛			2½x2½x3/16		
Coefficients	f_2	f_1	f_0	f_0	f_1	f_2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
	.116	.151	.074	.074	.151	.116	.232	.392	.276	.276	.392	.232	.116	.151	.074	.074	.151	.116	.232	.392	.276
Kips	-0.02	-0.07	0.02	0.01	-0.11	-0.03	0.13	0.18	-0.01	-0.25	0.16	0.28	0.03	0.03	-0.06	-0.05	0.04	-0.01	-0.44	-0.22	0.15
Actual Load	-0.07			-0.13			0.30			0.19			0			-0.02			-0.51		

Temperatures: Outside 50 °F, Room 68 °F, Instrument 72 °F | Date: Oct.10th 1964 | Time: Initial Zero Reading 10 00, Load Reading 10 16, Final Zero Reading | Type of Test Load: Transverse load at three conductor suspension points, Load in Pounds 3022 | Position of Gage: 0, 1, 2

Gage Number	A 22	A 23	A 24
Test Channel	21	22	23
Position of Gage	2	1	0
Microinches: Zero Reading	-002	-002	499
Microinches: Load Reading	003	-024	445
Microinches: Difference	005	-022	-054
Kips/in^2	0.15	-0.66	-1.62
Section	2½x2½x3/16		
Coefficients	f_2	f_1	f_0
	.276	.392	.232
Kips	0.04	-0.26	-0.38
Actual Load	-0.60		

Temperatures: Outside 67 °F, Room 69 °F, Instrument 71 °F | Date: Oct.12th 1964 | Time: Initial Zero Reading 6 18, Load Reading 6 42, Final Zero Reading | Type of Test Load: Transverse load at conductor suspension point, Load in Pounds 2350 | Position of Gage: 0, 1, 2

Gage Number	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	004	007	005	006	004	005	003	003	003	003	003	003	-003	495	-003	-005	001	-003	-003	-004	000
Microinches: Load Reading	002	-018	031	062	-038	-023	-020	008	021	011	006	006	017	507	-083	-019	002	-039	-069	-052	073
Microinches: Difference	-002	-025	026	056	-042	-028	-023	005	018	008	003	003	020	012	-080	-014	001	-036	-066	-048	073
Kips/in^2	-0.06	-075	0.78	1.68	-1.26	-0.84	-0.69	0.15	0.54	0.24	0.09	0.09	0.60	0.36	-2.40	-0.42	0.03	-1.08	-1.98	-1.44	2.19
Section	1½x1½x⅛			1½x1½x⅛			2½x2½x3/16			2½x2½x3/16			1½x1½x⅛			1½x1½x⅛			2½x2½x3/16		
Coefficients	f_2	f_1	f_0	f_0	f_1	f_2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
	.116	.151	.074	.074	.151	.116	.232	.392	.276	.276	.392	.232	.116	.151	.074	.074	.151	.116	.232	.392	.276
Kips	-0.01	-0.11	0.07	0.16	-0.19	-0.10	-0.16	0.06	0.15	0.07	0.04	0.02	0.07	0.05	-0.23	-0.04	0	-0.13	-0.46	-0.57	0.61
Actual Load	-0.05			-0.13			0.05			0.13			-0.11			-0.17			-0.42		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures: Outside 67 °F, Room 69 °F, Instrument 71 °F | Date: Oct.12th 1964 | Time: Initial Zero Reading 6 18, Load Reading 6 42, Final Zero Reading | Type of Test Load: Transverse load at conductor suspension point, Load in Pounds 2350 | Position of Gage: 0, 1, 2

Gage Number	A 22	A 23	A 24
Test Channel	21	22	23
Position of Gage	2	1	0
Microinches: Zero Reading	-002	001	-001
Microinches: Load Reading	-030	-004	-021
Microinches: Difference	-028	-005	-020
Kips/in^2	-0.84	-0.15	-0.60
Section	2½x2½x3/16		
Coefficients	f_2	f_1	f_0
	.276	.392	.232
Kips	-0.23	-0.06	-0.14
Actual Load	-0.43		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 48 °F Room 70 °F Instrument 75 °F	Oct.7th 1964	Initial Zero Reading 7 35 Load Reading 8 15 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2505	0, 1, 2

Gage Number	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	003	000	003	002	002	002	003	001	003	002	002	002	001	001	003	-001	000	000	000	002	003
Microinches: Load Reading	014	-002	008	-006	010	-010	-007	000	002	-003	-007	-010	397	303	441	-509	-330	-121	-142	088	-077
Microinches: Difference	011	-002	005	-008	008	-012	-010	-001	-001	-005	-009	-012	396	302	438	-508	-330	-121	-142	086	-080
$Kips/in^2$	-0.33	0.06	-0.15	0.24	-0.24	0.36	0.30	0.03	0.03	0.15	0.27	0.36	-11.88	-9.06	-13.14	15.24	9.90	3.63	4.26	-2.58	2.40
Section	1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
	.116	.151	.074	.074	.151	.116	.232	.392	.276	.276	.392	.232	.116	.151	.074	.074	.151	.116	.232	.392	.276
Kips	-0.04	0.01	-0.01	0.02	-0.04	0.04	0.07	0.01	0.01	0.05	0.11	0.09	-1.37	-1.36	-1.24	1.43	1.50	0.42	0.99	-1.01	0.66
Actual Load	-0.04			0.02			0.09			0.25			-3.97			3.35			0.64		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 48 °F Room 70 °F Instrument 75 °F	Oct.7 th 1964	Initial Zero Reading 7 35 Load Reading 8 15 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2505	0, 1, 2

Gage Number	A 22	A 23	A 24
Test Channel	21	22	23
Position of Gage	2	1	0
Microinches: Zero Reading	001	001	002
Microinches: Load Reading	036	-051	101
Microinches: Difference	035	-052	099
$Kips/in^2$ x (-1)	-1.05	1.56	-2.97
Section	2½x2½x3/16		
Coefficients	f_2	f_1	f_o
	.276	.392	.232
Kips	-0.29	0.61	-0.69
Actual Load	-0.37		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 44 °F Room 69 °F Instrument 75 °F	Oct.19th 1964	Initial Zero Reading 6 27 Load Reading 6 45 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2455	0, 1, 2

Gage Number	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	000	000	000	-001	-001	000	-003	-001	-004	-001	000	-001	-002	000	001	001	000	000	001	000	001
Microinches: Load Reading	-004	008	-003	004	-006	010	018	007	-006	005	002	008	-475	-319	-465	535	344	142	153	-109	091
Microinches: Difference	-004	008	-003	005	-005	010	021	008	-002	006	002	009	-473	-319	-464	534	344	142	152	-109	090
$Kips/in^2$	-0.12	0.24	-0.09	0.15	-0.15	0.30	0.63	0.24	-0.06	0.18	0.06	0.27	-14.19	-9.57	-1392	16.02	10.32	4.26	4.56	-3.27	2.70
Section	1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
	.116	.151	.074	.074	.151	.116	.232	.392	.276	.276	.392	.232	.116	.151	.074	.074	.151	.116	.232	.392	.276
Kips	-0.01	0.04	-0.01	0.01	-0.02	0.03	0.15	0.09	-0.01	0.05	0.02	0.06	-1.64	-1.45	-1.31	1.51	1.56	0.50	1.06	-1.28	0.75
Actual Load	0.02			0.02			0.23			0.13			-4.40			3.57			0.53		

Multiply ($Kips/in^2$) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 44 °F Room 69 °F Instrument 75 °F	Oct.19th 1964	Initial Zero Reading 6 27 Load Reading 6 45 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2455	0, 1, 2

Gage Number	A 22	A 23	A 24
Test Channel	21	22	23
Position of Gage	2	1	0
Microinches: Zero Reading	001	002	000
Microinches: Load Reading	-051	061	-108
Microinches: Difference	-052	059	-108
$Kips/in^2$	-1.56	1.77	-3.24
Section	2½x2½x3/16		
Coefficients	f_2	f_1	f_o
	.276	.392	.232
Kips	-0.43	0.69	-0.75
Actual Load	-0.49		

Multiply ($Kips/in^2$) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 44 °F Room 69 °F Instrument 74 °F	Oct.19th 1964	Initial Zero Reading 6 27 Load Reading 6 53 Final Zero Reading	Combined longitudinal and transverse load at ground wire suspension point Load in Pounds 2455 longit. 1100 transv.	0, 1, 2

Gage Number	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	000	000	000	-001	-001	000	-003	-001	-004	-001	000	-001	-002	000	001	001	000	000	001	000	001
Microinches: Load Reading	014	034	018	019	025	022	037	025	022	005	034	059	-455	-345	-471	488	310	110	096	-139	102
Microinches: Difference	014	034	018	020	026	022	040	026	026	006	034	060	-453	-345	-472	487	310	110	095	-139	101
Kips/in²	0.42	1.02	0.54	0.60	0.78	0.66	1.20	0.78	0.78	0.18	1.02	1.80	-13.59	-10.35	-14.16	14.61	9.30	3.30	2.85	-4.17	3.03
Section	1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
	.116	.151	.074	.074	.151	.116	.232	.392	.276	.276	.392	.232	.116	.151	.074	.074	.151	.116	.232	.392	.276
Kips	0.05	0.15	0.05	0.06	0.12	0.08	0.28	0.31	0.22	0.05	0.40	0.42	-1.58	-1.56	-1.33	1.37	1.40	0.38	0.66	-1.63	0.84
Actual Load	0.25			0.26			0.81			0.87			-4.47			3.15			-0.13		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 44 °F Room 69 °F Instrument 74 °F	Oct.19th 1964	Initial Zero Reading 6 27 Load Reading 6 53 Final Zero Reading	Combined longitudinal and transverse load at ground wire suspension point Load in Pounds 2455 longit. 1100 transv.	0, 1, 2

Gage Number	A 22	A 23	A 24
Test Channel	21	22	23
Position of Gage	2	1	0
Microinches: Zero Reading	001	002	000
Microinches: Load Reading	-069	046	-125
Microinches: Difference	-070	044	-125
Kips/in²	-2.10	1.32	-3.75
Section	2½x2½x3/16		
Coefficients	f_2	f_1	f_o
	.276	.392	.232
Kips	-0.57	0.54	-0.87
Actual Load	-0.90		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 44 °F Room 69 °F Instrument 74 °F	Oct.19th 1964	Initial Zero Reading 6 27 Load Reading Final Zero Reading 7 06	Zero control reading Load in Pounds No load	0, 1, 2

Gage Number	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	000	000	000	-001	-001	000	-003	-001	-004	-001	000	-001	-002	000	001	001	000	000	001	000	001
Microinches: Load Reading	001	001	001	000	001	002	-002	-001	-001	000	001	000	000	-002	006	004	-001	-002	002	000	000
Microinches: Difference	001	001	001	001	003	002	001	000	003	001	001	001	002	-001	005	003	-001	-002	001	000	003
Kips/in²	0.03	0.03	0.03	0.03	0.09	0.06	0.03	0	0.09	0.03	0.03	0.03	0.06	-0.03	0.15	0.09	-0.03	-0.06	0.03	0	0.09
Section	1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
	.116	.151	.074	.074	.151	.116	.232	.392	.276	.276	.392	.232	.116	.151	.074	.074	.151	.116	.232	.392	.276
Kips	0	0	0	0	0	0	0.01	0	0.02	0.01	0.01	0.01	-0.01	0	0.01	0.01	0	-0.01	0.01	0	0.02
Actual Load	0			0			0.03			0.03			0			0			0.03		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 44 °F Room 69 °F Instrument 74 °F	Oct.19th 1964	Initial Zero Reading 6 27 Load Reading Final Zero Reading 7 06	Zero control reading Load in Pounds No load	0, 1, 2

Gage Number	A 22	A 23	A 24
Test Channel	21	22	23
Position of Gage	2	1	0
Microinches: Zero Reading	001	002	000
Microinches: Load Reading	000	001	004
Microinches: Difference	-001	-001	004
Kips/in²	-0.03	-0.03	0.12
Section	2½x2½x3/16		
Coefficients	f_2	f_1	f_o
	.276	.392	.232
Kips	-0.01	-0.01	0.03
Actual Load	0.01		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 46 °F, Room 70 °F, Instrument 73 °F | Date: Oct.8th 1964 | Time: Initial Zero Reading 10 55, Load Reading 11 16, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1605 | Position of Gage: 0, 1, 2

Gage Number	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	-004	000	-001	-002	-002	-004	-004	-005	-003	-004	000	-003	000	-001	000	-002	-001	-005	-002	-003	000
Microinches: Load Reading	006	037	034	-050	057	048	014	018	038	021	033	-008	-015	-025	-046	-053	-040	-028	-089	-004	000
Microinches: Difference	010	037	035	-048	059	052	018	023	041	025	033	-005	-015	-024	-046	-051	-039	-023	-087	-001	000
Kips/in^2	0.30	1.11	1.05	-1.44	1.77	1.56	0.54	0.69	1.23	0.75	0.99	-0.15	-0.45	-0.72	-1.38	-1.53	-1.17	-0.69	-2.61	-0.03	000
Section	1½x1½x^{1}8			1½x1½x^{1}8			2½x2½x^{3}16			2½x2½x^{3}16			1½x1½x^{1}8			1½x1½x^{1}8			2½x2½x^{3}16		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
	.116	.151	.074	.074	.151	.116	.232	.392	.276	.276	.392	.232	.116	.151	.074	.074	.151	.116	.232	.392	.276
Kips	0.03	0.17	0.10	-0.14	0.27	0.18	0.13	0.27	0.34	0.21	0.39	-0.03	-0.05	-0.11	-0.13	-0.14	-0.18	-0.08	-0.61	-0.01	0
Actual Load	0.30			0.31			0.74			0.57			-0.29			-0.40			-0.62		

Temperatures: Outside 46 °F, Room 70 °F, Instrument 73 °F | Date: Oct.8th 1964 | Time: Initial Zero Reading 10 55, Load Reading 11 16, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1605 | Position of Gage: 0, 1, 2

Gage Number	A 22	A 23	A 24
Test Channel	21	22	23
Position of Gage	2	1	0
Microinches: Zero Reading	000	000	000
Microinches: Load Reading	-007	-021	-052
Microinches: Difference	-007	-021	-052
Kips/in^2	-0.21	-0.63	-1.56
Section	2½x2½x^{3}16		
Coefficients	f_2	f_1	f_o
	.276	.392	.232
Kips	-0.06	-0.25	-0.36
Actual Load	-0.67		

Temperatures: Outside 44 °F, Room 69 °F, Instrument 74 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 6 27, Load Reading 6 54, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	A 11	A 12	A 13	A 14	A 15	A 16	A 17	A 18	A 19	A 20	A 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	000	000	000	-001	-001	000	-003	-001	-004	-001	000	-001	-002	000	001	001	000	000	001	000	001
Microinches: Load Reading	022	029	021	012	033	009	020	022	021	001	024	045	-011	-027	-005	-031	-033	-025	-053	-032	006
Microinches: Difference	022	029	021	013	034	009	023	023	025	002	024	046	-009	-027	-006	-032	-033	-025	-054	-032	005
Kips/in^2	0.66	0.87	0.63	0.39	1.02	0.27	0.69	0.69	0.75	0.06	0.72	1.38	-0.27	-0.81	-0.18	-0.96	-0.99	-0.75	-1.62	-0.96	0.15
Section	1½x1½x^{1}8			1½x1½x^{1}8			2½x2½x^{3}16			2½x2½x^{3}16			1½x1½x^{1}8			1½x1½x^{1}8			2½x2½x^{3}16		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2
	.116	.151	.074	.074	.151	.116	.232	.392	.276	.276	.392	.232	.116	.151	.074	.074	.151	.116	.232	.392	.276
Kips	0.08	0.13	0.06	0.04	0.15	0.03	0.16	0.27	0.21	0.02	0.28	0.32	-0.03	-0.12	-0.02	-0.09	-0.15	-0.09	-0.38	-0.38	0.04
Actual Load	0.27			0.22			0.64			0.62			-0.17			-0.33			-0.72		

Temperatures: Outside 44 °F, Room 69 °F, Instrument 74 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 6 27, Load Reading 6 54, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number	A 22	A 23	A 24
Test Channel	21	22	23
Position of Gage	2	1	0
Microinches: Zero Reading	001	002	000
Microinches: Load Reading	-016	-010	-020
Microinches: Difference	-017	-012	-020
Kips/in^2	-0.51	-0.36	-0.60
Section	2½x2½x^{3}16		
Coefficients	f_2	f_1	f_o
	.276	.392	.232
Kips	-0.14	-0.14	-0.14
Actual Load	-0.42		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 58 °F, Room 70 °F, Instrument 76 °F
Date: Oct.3rd 1964
Time: Initial Zero Reading; Load Reading 3 00; Final Zero Reading
Type of Test Load: Longitudinal load at conductor suspension point. Load in Pounds 2305
Position of Gage: 0, 1, 2

Gage Number	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15	B 16	B 17	B 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	000	-002	-002	000	001	-001	-002	-002	002	001	002	000	001	001	-001	001	000	000
Microinches: Load Reading	-057	-100	-045	024	039	014	-040	-061	-049	024	075	041	022	027	020	-078	-080	007
Microinches: Difference	-057	-098	-043	024	038	015	-038	-059	-051	023	073	041	021	026	021	-079	-080	007
$Kips/in^2$ x (-1)	-1.71	+2.94	1.29	-0.72	-1.14	-0.45	-1.14	1.77	1.53	-0.69	-2.19	-1.23	-0.63	-0.78	-0.63	2.37	2.40	-0.21
Section	$1^3\!/_4$x$1^3\!/_4$x$^3\!/_{16}$			$1^1\!/_2$x$1^1\!/_2$x$^1\!/_8$			$1^1\!/_2$x$1^1\!/_2$x$^1\!/_8$			$1^3\!/_4$x$1^3\!/_4$x$^3\!/_{16}$			1x1x$^1\!/_8$			1x1x$^1\!/_8$		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.085	.078	.067	.067	.078	.085
Kips	0.30	0.73	0.27	-0.07	-0.18	-0.05	0.14	0.27	0.14	-0.17	-0.24	-0.20	-0.06	-0.06	-0.04	0.16	0.19	-0.02
Actual Load	1.30			-0.30			0.55			-0.92			-0.16			0.33		

Temperatures: Outside 58 °F, Room 70 °F, Instrument 76 °F
Date: Oct.3rd 1964
Time: Initial Zero Reading; Load Reading 3 00; Final Zero Reading
Type of Test Load: Longitudinal load at conductor suspension point. Load in Pounds 2305
Position of Gage: 0, 1, 2

Gage Number	B 19	B 20	B 21	B 22	B 23	B 24	B 25	B 26	B 27	B 28	B 29	B 30	B 31	B 32	B 33	B 34	B 35	B 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	-002	000	-001	001	-003	001	-001	-002	-002	001	002	500	001	000	000	001	001	000
Microinches: Load Reading	-052	231	379	-068	041	-136	019	005	044	-357	-504	668	204	-220	-379	437	483	-018
Microinches: Difference	-050	231	380	-069	044	-137	020	007	046	-358	-506	168	203	-220	-379	436	482	-018
$Kips/in^2$ x (-1)	1.50	-6.93	-11.40	2.07	-1.32	4.14	-0.60	-0.21	-1.38	10.74	15.18	-5.04	-6.09	6.60	11.87	-13.08	-14.46	0.54
Section	$1^3\!/_4$x$1^3\!/_4$x$^3\!/_{16}$			$1^1\!/_2$x$1^1\!/_2$x$^1\!/_8$			$1^1\!/_2$x$1^1\!/_2$x$^1\!/_8$			$1^3\!/_4$x$1^3\!/_4$x$^3\!/_{16}$			1x1x$^1\!/_8$			1x1x$^1\!/_8$		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.085	.078	.067	.067	.078	.085
Kips	0.30	-1.69	-1.97	0.19	-0.20	0.48	-0.07	-0.03	-0.13	1.86	3.71	-1.02	-0.52	0.52	0.80	-0.88	-1.13	0.05
Actual Load	-3.35			0.47			-0.23			4.55			0.80			-1.96		

Temperatures: Outside 62 °F, Room 69 °F, Instrument 74 °F
Date: Oct.12th 1964
Time: Initial Zero Reading 7 13; Load Reading 7 35; Final Zero Reading
Type of Test Load: Longitudinal load at conductor suspension point. Load in Pounds 2255
Position of Gage: 0, 1, 2

Gage Number	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15	B 16	B 17	B 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	-004	-004	-005	-011	-004	-003	-004	-004	-005	-003	-003	000	002	004	001	002	-001	001
Microinches: Load Reading	038	107	055	-010	-016	-019	030	041	030	-026	-058	-027	-003	-035	-031	098	088	-006
Microinches: Difference	042	111	060	001	-012	-016	034	045	035	-023	-055	-027	-005	-039	-032	896	089	-007
$Kips/in^2$	1.26	3.33	1.80	-0.03	-0.36	-0.48	1.02	1.35	1.05	-0.69	-1.65	-0.81	-0.15	-1.17	-0.96	2.88	2.67	-0.21
Section	$1^3\!/_4$x$1^3\!/_4$x$^3\!/_{16}$			$1^1\!/_2$x$1^1\!/_2$x$^1\!/_8$			$1^1\!/_2$x$1^1\!/_2$x$^1\!/_8$			$1^3\!/_4$x$1^3\!/_4$x$^3\!/_{16}$			1x1x$^1\!/_8$			1x1x$^1\!/_8$		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.085	.078	.067	.067	.078	.085
Kips	0.25	0.81	0.31	0	-0.05	-0.06	0.12	0.20	0.10	-0.12	-0.40	-0.16	-0.01	-0.09	-0.06	0.19	0.21	-0.02
Actual Load	1.37			-0.11			0.42			-0.68			-0.16			0.38		

Multiply ($Kips/in^2$) by -1 when initial Zero was read with test load on.

Temperatures: Outside 62 °F, Room 69 °F, Instrument 74 °F
Date: Oct.12th 1964
Time: Initial Zero Reading 7 13; Load Reading 7 35; Final Zero Reading
Type of Test Load: Longitudinal load at conductor suspension point. Load in Pounds 2255
Position of Gage: 0, 1, 2

Gage Number	B 19	B 20	B 21	B 22	B 23	B 24	B 25	B 26	B 27	B 28	B 29	B 30	B 31	B 32	B 33	B 34	B 35	B 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	005	004	000	-002	-002	000	000	-002	-002	000	003	505	-002	-001	-004	501	-001	000
Microinches: Load Reading	115	-206	-425	077	-059	144	-015	-003	027	370	581	300	-215	257	420	058	-545	042
Microinches: Difference	110	-210	-425	079	-057	144	-015	-001	029	370	578	-205	-213	258	424	-443	-544	042
$Kips/in^2$	3.30	-6.30	-12.75	2 .37	-1.71	4.32	-0.45	-0.03	0.87	11.10	17.34	-6.15	-6.39	7.74	12.72	-13.29	-1632	1.26
Section	$1^3\!/_4$x$1^3\!/_4$x$^3\!/_{16}$			$1^1\!/_2$x$1^1\!/_2$x$^1\!/_8$			$1^1\!/_2$x$1^1\!/_2$x$^1\!/_8$			$1^3\!/_4$x$1^3\!/_4$x$^3\!/_{16}$			1x1x$^1\!/_8$			1x1x$^1\!/_8$		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.085	.078	.067	.067	.078	.085
Kips	0.67	-1.54	-2.21	0.22	-0.26	0.50	-0.05	0	0.08	1.92	4.24	-1.24	-0.54	0.60	0.85	-0.90	-1.27	0.11
Actual Load	-3.08			0.46			0.03			4.92			0.91			-2.06		

Multiply ($Kips/in^2$) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 62 °F, Room 69 °F, Instrument 73.5 °F | Date: Oct. 12th 1964 | Time: Initial Zero Reading 7 13, Load Reading 7 46, Final Zero Reading | Type of Test Load: Combined longitudinal and transverse load at conductor suspension point. Load in Pounds 2255 longit. 2350 transv. | Position of Gage: 0, 1, 2

Gage Number	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15	B 16	B 17	B 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	-004	-004	-005	-011	-004	-003	-004	-004	-005	-003	-003	000	002	004	001	002	-001	001
Microinches: Load Reading	044	080	010	085	047	053	091	121	140	-064	-074	-032	-009	-038	-024	088	071	-009
Microinches: Difference	048	084	015	096	051	056	095	125	145	-061	-071	-032	-011	-042	-025	086	072	-010
Kips/in^2	1.44	2.52	0.45	2.88	1.53	1.68	2.85	3.75	4.35	-1.83	-2.13	-0.96	-0.33	-1.26	-0.75	2.58	2.16	-0.30
Section	1 3/4x1 3/4x3/16			1 1/2x1 1/2x1/8			1 1/2x1 1/2x1/8			1 3/4x1 3/4x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.29	0.62	0.08	0.27	0.23	0.20	0.48	0.57	0.41	-0.32	-0.52	-0.19	-0.03	-0.10	-0.05	0.17	0.17	-0.03
Actual Load	0.99			0.70			1.46			-1.03			-0.18			0.31		

Temperatures: Outside 62 °F, Room 69 °F, Instrument 73.5 °F | Date: Oct. 12th 1964 | Time: Initial Zero Reading 7 13, Load Reading 7 46, Final Zero Reading | Type of Test Load: Combined longitudinal and transverse load at conductor suspension point. Load in Pounds 2255 long. 2350 transv. | Position of Gage: 0, 1, 2

Gage Number	B 19	B 20	B 21	B 22	B 23	B 24	B 25	B 26	B 27	B 28	B 29	B 30	B 31	B 32	B 33	B 34	B 35	B 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	005	004	000	-002	-002	000	000	-002	-002	000	003	505	-002	-001	-004	501	-001	000
Microinches: Load Reading	136	-144	-361	-033	-149	080	-073	-046	-050	371	582	284	-215	265	420	055	-516	070
Microinches: Difference	131	-144	-361	-031	-147	080	-073	-044	-048	371	579	-221	-213	266	424	-446	-515	070
Kips/in^2	3.93	-4.32	-10.83	-0.93	-4.41	2.40	-2.19	-1.32	-1.44	11.13	17.37	-6.63	-6.39	7.98	12.72	-13.38	-15.45	2.10
Section	1 3/4x1 3/4x3/16			1 1/2x1 1/2x1/8			1 1/2x1 1/2x1/8			1 3/4x1 3/4x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.80	-1.05	-1.88	-0.09	-0.67	0.28	-0.25	-0.20	-0.11	1.93	4.23	-1.33	-0.54	0.62	0.85	-0.90	-1.21	0.18
Actual Load	-2.13			-0.48			-0.59			4.83			0.93			-1.93		

Temperatures: Outside 62 °F, Room 69 °F, Instrument 73 °F | Date: Oct. 12th 1964 | Time: Initial Zero Reading 7 13, Load Reading, Final Zero Reading 8 00 | Type of Test Load: Zero control reading. Load in Pounds No load | Position of Gage: 0, 1, 2

Gage Number	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15	B 16	B 17	B 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	-004	-004	-005	-011	-004	-003	-004	-004	-005	-003	-003	000	002	004	001	002	-001	001
Microinches: Load Reading	011	011	004	012	015	010	011	008	010	001	017	023	028	025	024	024	019	020
Microinches: Difference	015	015	009	023	019	013	015	012	015	004	020	023	026	021	023	022	020	019
Kips/in^2	0.45	0.45	0.27	0.69	0.57	0.39	0.45	0.36	0.45	0.12	0.60	0.69	0.78	0.63	0.69	0.66	0.60	0.57
Section	1 3/4x1 3/4x3/16			1 1/2x1 1/2x1/8			1 1/2x1 1/2x1/8			1 3/4x1 3/4x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.09	0.11	0.04	0.07	0.09	0.05	0.05	0.05	0.04	0.02	0.14	0.14	0.07	0.05	0.05	0.04	0.05	0.05
Actual Load	0.24			0.21			0.14			0.30			0.17			0.14		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures: Outside 62 °F, Room 69 °F, Instrument 73 °F | Date: Oct. 12th 1964 | Time: Initial Zero Reading 7 13, Load Reading, Final Zero Reading 8 00 | Type of Test Load: Zero control reading. Load in Pounds No load | Position of Gage: 0, 1, 2

Gage Number	B 19	B 20	B 21	B 22	B 23	B 24	B 25	B 26	B 27	B 28	B 29	B 30	B 31	B 32	B 33	B 34	B 35	B 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	005	004	000	-002	-002	000	000	-002	-002	000	003	505	-002	-001	-004	501	-001	000
Microinches: No Load Reading	029	014	015	011	016	013	017	015	015	015	006	523	012	016	019	520	017	010
Microinches: Difference	024	010	015	013	018	013	017	017	017	015	003	018	014	017	023	019	018	010
Kips/in^2	0.72	0.30	0.45	0.39	0.54	0.39	0.51	0.51	0.51	0.45	0.09	0.54	0.42	0.51	0.69	0.57	0.54	0.30
Section	1 3/4x1 3/4x3/16			1 1/2x1 1/2x1/8			1 1/2x1 1/2x1/8			1 3/4x1 3/4x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.15	0.07	0.08	0.04	0.08	0.05	0.06	0.08	0.05	0.08	0.02	0.12	0.04	0.04	0.05	0.04	0.04	0.03
Actual Load	0.30			0.17			0.19			0.22			0.13			0.11		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 46 °F, Room 69 °F, Instrument 73 °F | Date: Oct.10th 1964 | Time: Initial Zero Reading 8 52, Load Reading 9 12, Final Zero Reading | Type of Test Load: Transverse load at three conductor suspension points, Load in Pounds 3022 | Position of Gage: 0, 1, 2

Gage Number	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15	B 16	B 17	B 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	001	004	003	003	001	-001	-001	-002	-004	-002	-003	-001	-003	-004	-002	-002	-002	-002
Load Reading	020	046	030	-106	-098	-086	-072	-108	-112	019	038	034	037	-006	-019	022	024	-008
Difference	019	042	027	-109	-099	-085	-071	-106	-108	021	041	035	040	-002	-017	024	026	-006
Kips/in^2 x (-1)	-0.57	-1.26	-0.81	3.27	2.97	2.55	2.13	3.18	3.24	-0.63	-1.23	-1.05	-1.20	0.06	0.51	-0.72	-0.78	0.18
Section	1-3/4x1-3/4x3/16			1-1/2x1-1/2x1/8			1-1/2x1-1/2x1/8			1-3/4x1-3/4x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	-0.12	-0.31	-0.14	0.31	0.45	0.30	0.25	0.48	0.31	-0.11	-0.30	-0.21	-0.10	0	0.03	-0.05	-0.06	0.02
Actual Load	-0.57			1.06			1.04			-0.62			-0.07			-0.09		

Temperatures: Outside 46 °F, Room 69 °F, Instrument 73 °F | Date: Oct.10th 1964 | Time: Initial Zero Reading 8 52, Load Reading 9 12, Final Zero Reading | Type of Test Load: Transverse load at three conductor suspension points, Load in Pounds 3022 | Position of Gage: 0, 1, 2

Gage Number	B 19	B 20	B 21	B 22	B 23	B 24	B 25	B 26	B 27	B 28	B 29	B 30	B 31	B 32	B 33	B 34	B 35	B 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	-004	-005	-004	-006	-003	-006	-003	-002	-001	-002	-002	496	-003	-004	-005	499	-001	000
Load Reading	-031	-065	-036	122	123	079	096	091	095	-008	-041	474	006	-025	-022	520	-007	-049
Difference	-027	-060	-032	128	126	085	099	093	096	-006	-039	-022	009	-021	-017	021	-006	-049
Kips/in^2 x (-1)	0.81	1.80	0.96	-3.84	-3.78	-2.55	-2.97	-2.79	-2.88	0.18	1.17	0.66	-0.27	0.63	0.51	-0.63	0.18	1.47
Section	1-3/4x1-3/4x3/16			1-1/2x1-1/2x1/8			1-1/2x1-1/2x1/8			1-3/4x1-3/4x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.16	0.44	0.17	-0.36	-0.57	-0.30	-0.34	-0.42	-0.27	0.31	0.26	0.13	-0.02	0.05	0.03	-0.04	0.01	0.13
Actual Load	0.77			-1.23			-1.03			0.70			0.06			0.10		

Temperatures: Outside 62 °F, Room 69 °F, Instrument 73 °F | Date: Oct.12th 1964 | Time: Initial Zero Reading 7 13, Load Reading 7 54, Final Zero Reading | Type of Test Load: Transverse load at three conductor suspension points, Load in Pounds 2350 | Position of Gage: 0, 1, 2

Gage Number	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15	B 16	B 17	B 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	-004	-004	-005	-011	-004	-003	-004	-004	-005	-003	-003	000	002	004	001	002	-001	001
Load Reading	014	-009	-023	108	085	076	069	093	117	-025	-011	007	005	026	039	017	011	028
Difference	018	-005	-018	119	089	079	073	097	122	-022	-008	007	003	022	038	015	012	027
Kips/in^2	0.54	-0.15	-0.54	3.57	2.67	2.37	2.19	2.91	3.66	-0.66	-0.24	0.21	0.09	0.66	1.14	0.45	0.36	0.81
Section	1-3/4x1-3/4x3/16			1-1/2x1-1/2x1/8			1-1/2x1-1/2x1/8			1-3/4x1-3/4x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.11	-0.04	-0.08	0.33	0.40	0.27	0.25	0.44	0.34	-0.11	-0.06	0.04	0.01	0.05	0.08	0.03	0.03	0.06
Actual Load	-0.01			1.00			1.03			-0.13			0.14			0.12		

Temperatures: Outside 62 °F, Room 69 °F, Instrument 73 °F | Date: Oct.12th 1964 | Time: Initial Zero Reading 7 13, Load Reading 7 54, Final Zero Reading | Type of Test Load: Transverse load at three conductor suspension points, Load in Pounds 2350 | Position of Gage: 0, 1, 2

Gage Number	B 19	B 20	B 21	B 22	B 23	B 24	B 25	B 26	B 27	B 28	B 29	B 30	B 31	B 32	B 33	B 34	B 35	B 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	005	004	000	-002	-002	000	000	-002	-002	000	003	505	-002	-001	-004	501	-001	000
Load Reading	056	063	059	-082	-061	-039	-036	-029	-047	034	039	534	018	036	045	521	032	055
Difference	051	059	059	-080	-059	-039	-036	-027	-045	034	036	029	020	037	049	020	033	055
Kips/in^2	1.53	1.77	1.77	-2.40	-1.77	-1.17	-1.08	-0.71	-1.35	1.02	1.08	0.77	0.60	1.11	1.47	0.60	0.99	1.65
Section	1-3/4x1-3/4x3/16			1-1/2x1-1/2x1/8			1-1/2x1-1/2x1/8			1-3/4x1-3/4x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.31	0.43	0.31	-0.23	-0.27	-0.14	-0.13	-0.11	-0.13	0.18	0.26	0.16	0.05	0.09	0.10	0.04	0.08	0.14
Actual Load	1.05			-0.64			-0.37			0.60			0.24			0.26		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 49 °F, Room 70 °F, Instrument 75 °F | Date: Oct.7th 1964 | Time: Initial Zero Reading 6 50, Load Reading 7 15, Final Zero Reading | Type of Test Load: Longitudinal load at ground wire suspension point, Load in Pounds 2505 | Position of Gage 0, 1, 2

Gage Number	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15	B 16	B 17	B 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	008	008	009	007	007	007	004	007	006	007	006	005	005	005	006	006	004	006
Microinches: Load Reading	-004	013	-038	-024	-047	-011	022	088	054	035	-025	-017	-055	027	033	-003	000	005
Microinches: Difference	-012	005	-047	-031	+054	-018	018	081	048	028	-031	-022	-060	022	027	-009	-004	-001
Kips/in^2	-0.36	0.15	-1.41	-0.93	1.62	-0.54	0.54	2.43	1.44	0.84	-0.93	-0.66	-1.80	0.66	0.81	-0.27	-0.12	-0.03
Section	1¾x1¾x3/16			1½x1½x1/8			1½x1½x1/8			1¾x1¾x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	-0.07	0.03	-0.25	-0.09	-0.24	-0.06	0.06	0.37	0.14	0.15	-0.22	-0.13	-0.16	0.05	0.05	-0.02	-0.01	0
Actual Load	-0.29			-0.39			0.57			-0.21			-0.06			-0.03		

Temperatures: Outside 49 °F, Room 70 °F, Instrument 75 °F | Date: Oct.7th 1964 | Time: Initial Zero Reading 6 50, Load Reading 7 15, Final Zero Reading | Type of Test Load: Longitudinal load at ground wire suspension point, Load in Pounds 2505 | Position of Gage 0, 1, 2

Gage Number	B 19	B 20	B 21	B 22	B 23	B 24	B 25	B 26	B 27	B 28	B 29	B 30	B 31	B 32	B 33	B 34	B 35	B 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	004	005	005	007	005	004	007	006	004	007	007	504	006	005	005	503	005	003
Microinches: Load Reading	-285	-368	-499	040	-096	091	-037	006	-014	496	598	636	-184	120	150	202	-358	032
Microinches: Difference	-289	-373	-504	033	-101	087	-044	000	-018	489	591	132	-190	115	145	-301	-363	029
Kips/in^2	-8.67	11.19	-15.12	0.99	-3.03	2.61	-1.32	000	-0.54	14.67	17.73	3.96	-5.70	3.45	4.35	-9.03	-10.89	0.87
Section	1¾x1¾x3/16			1½x1½x1/8			1½x1½x1/8			1¾x1¾x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	-1.76	-2.72	-2.62	0.09	-0.46	0.30	-0.15	0	-0.05	2.54	4.30	0.80	-0.48	0.27	0.29	-0.61	-0.85	0.07
Actual Load	-7.10			-0.07			-0.20			7.64			0.08			-1.39		

Temperatures: Outside 62 °F, Room 72 °F, Instrument 76.5 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 2 10, Load Reading 2 15, Final Zero Reading | Type of Test Load: Longitudinal load at ground wire suspension point, Load in Pounds 2455 | Position of Gage 0, 1, 2

Gage Number	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15	B 16	B 17	B 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	003	002	006	005	002	001	000	002	001	000	-001	001	001	001	002	002	001	001
Microinches: Load Reading	006	023	-024	-001	-029	-010	018	089	060	025	-026	-007	-048	021	027	006	008	002
Microinches: Difference	003	021	-030	-006	-031	-011	018	087	059	025	-025	-008	-049	020	025	004	007	001
Kips/in^2	0.09	0.63	-0.90	-0.18	-0.93	-0.33	0.54	2.61	1.77	0.75	-0.75	-0.24	-1.47	0.60	0.75	0.12	0.21	0.03
Section	1¾x1¾x3/16			1½x1½x1/8			1½x1½x1/8			1¾x1¾x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.02	0.15	-0.16	-0.02	-0.14	-0.04	0.06	0.39	0.17	0.13	-0.18	-0.05	-0.12	0.05	0.05	0.01	0.02	0
Actual Load	0.01			-0.20			0.62			-0.10			-0.02			0.03		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures: Outside 62 °F, Room 72 °F, Instrument 76.5 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 2 10, Load Reading 2 15, Final Zero Reading | Type of Test Load: Longitudinal load at ground wire suspension point, Load in Pounds 2455 | Position of Gage 0, 1, 2

Gage Number	B 19	B 20	B 21	B 22	B 23	B 24	B 25	B 26	B 27	B 28	B 29	B 30	B 31	B 32	B 33	B 34	B 35	B 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	-001	-004	-005	005	-001	000	001	003	-002	000	-002	497	-006	-003	-006	501	-004	-001
Microinches: Load Reading	-288	-403	-546	038	-109	100	-029	020	-007	542	649	608	-210	128	155	169	-390	040
Microinches: Difference	-287	-399	-541	033	-108	100	-030	017	-005	542	651	111	-204	131	161	332	-386	041
Kips/in^2	-8.61	-11.97	-16.23	0.99	-3.24	3.00	-0.90	0.51	-0.15	16.26	1953	3.33	-6.12	3.93	4.83	-9.96	-11.58	1.23
Section	1¾x1¾x3/16			1½x1½x1/8			1½x1½x1/8			1¾x1¾x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	-1.74	-2.92	-2.79	0.09	-0.49	0.35	-0.10	0.08	-0.01	2.81	4.77	0.67	-0.52	0.31	0.33	-0.67	-0.90	0.10
Actual Load	-7.45			-0.05			0.06			8.25			0.12			-1.47		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 62 °F, Room 73 °F, Instrument 76.5 °F
Date: Oct.17th 1964
Time: Initial Zero Reading 2 10; Load Reading 2 22; Final Zero Reading
Type of Test Load: Combined longitudinal and transverse load at ground wire suspension point. Load in Pounds 2455 longit. 1100 transv.
Position of Gage: 0, 1, 2

Gage Number	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15	B 16	B 17	B 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	003	002	006	005	002	001	000	002	001	000	-001	001	001	001	002	002	001	001
Microinches: Load Reading	028	018	-054	059	-008	028	052	130	134	009	-027	006	-053	025	041	002	000	005
Microinches: Difference	025	016	-060	054	-010	027	052	128	133	009	-026	005	-054	024	039	000	-001	004
Kips/in^2	0.75	0.48	-1.80	1.62	-0.30	0.81	1.56	3.84	3.99	0.27	-0.78	0.15	-1.62	0.72	1.17	0	-0.03	0.12
Section	1 3/4x1 3/4x3/16			1 1/2x1 1/2x1/8			1 1/2x1 1/2x1/8			1 3/4x1 3/4x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.15	0.12	-0.31	0.15	-0.05	0.09	0.18	0.58	0.38	0.05	-0.19	0.03	-0.14	0.06	0.08	0	0	0.01
Actual Load	-0.04			0.19			1.14			-0.11			0			0		

Temperatures: Outside 62 °F, Room 73 °F, Instrument 76.5 °F
Date: Oct.17th 1964
Time: Initial Zero Reading 2 10; Load Reading 2 22; Final Zero Reading
Type of Test Load: Combined longitudinal and transverse load at ground wire suspension point. Load in Pounds 2455 longit. 1100 transv.
Position of Gage: 0, 1, 2

Gage Number	B 19	B 20	B 21	B 22	B 23	B 24	B 25	B 26	B 27	B 28	B 29	B 30	B 31	B 32	B 33	B 34	B 35	B 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	-001	-004	-005	005	-001	000	001	003	-002	000	-002	497	-006	-003	-006	501	-004	-001
Microinches: Load Reading	-272	-368	-491	-041	-151	075	-059	010	-051	543	639	575	-205	141	162	160	-377	054
Microinches: Difference	-271	-364	-486	-046	-150	075	-060	007	-049	543	641	078	-199	144	168	-341	-373	055
Kips/in^2	-8.13	-10.92	-14.58	-1.38	-4.50	2.25	-1.80	0.21	-1.47	16.29	19.23	2.34	-5.97	4.32	5.04	-10.23	-11.19	1.65
Section	1 3/4x1 3/4x3/16			1 1/2x1 1/2x1/8			1 1/2x1 1/2x1/8			1 3/4x1 3/4x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	-1.64	-2.66	-2.52	-0.13	-0.68	0.26	-0.21	0.03	-0.14	2.82	4.70	0.47	-0.51	0.34	0.34	-0.69	-0.87	0.14
Actual Load	-6.82			-0.55			-0.32			7.99			0.17			-1.42		

Temperatures: Outside 62 °F, Room 73 °F, Instrument 76.5 °F
Date: Oct.17th 1964
Time: Initial Zero Reading 2 10; Load Reading; Final Zero Reading 2 42
Type of Test Load: Zero control reading. Load in Pounds: No load
Position of Gage: 0, 1, 2

Gage Number	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15	B 16	B 17	B 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	003	002	006	005	002	001	000	002	001	000	-001	001	001	001	002	002	001	001
Microinches: Load Reading	012	008	-003	012	-006	001	-001	000	011	-001	004	013	005	000	002	002	002	000
Microinches: Difference	009	006	-009	007	-008	000	-001	-002	010	-001	005	012	004	-001	000	000	001	-001
Kips/in^2	0.27	0.18	-0.27	0.21	-0.24	0	-0.03	-0.06	0.30	-0.03	0.15	0.36	0.12	-0.03	0	0	0.03	-0.03
Section	1 3/4x1 3/4x3/16			1 1/2x1 1/2x1/8			1 1/2x1 1/2x1/8			1 3/4x1 3/4x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.05	0.04	-0.05	0.02	-0.04	0	0	-0.01	0.03	-0.01	0.04	0.07	0.01	0	0	0	0	0
Actual Load	0.04			-0.02			0.02			0.10			0.01			0		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures: Outside 62 °F, Room 73 °F, Instrument 76.5 °F
Date: Oct.17th 1964
Time: Initial Zero Reading 2 10; Load Reading; Final Zero Reading 2 42
Type of Test Load: Zero control reading. Load in Pounds: No load
Position of Gage: 0, 1, 2

Gage Number	B 19	B 20	B 21	B 22	B 23	B 24	B 25	B 26	B 27	B 28	B 29	B 30	B 31	B 32	B 33	B 34	B 35	B 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	-001	-004	-005	005	-001	000	001	003	-002	000	-002	497	-006	-003	-006	501	-004	-001
Microinches: Load Reading	-002	-003	013	004	011	007	008	015	-002	005	-011	499	003	001	-004	510	009	-002
Microinches: Difference	-001	001	018	-001	012	007	007	012	000	005	-009	002	009	004	002	009	013	-001
Kips/in^2	-003	0.03	0.54	-0.03	0.36	0.21	0.21	0.36	0	0.15	-0.27	0.06	0.27	0.12	0.06	0.27	0.39	-0.03
Section	1 3/4x1 3/4x3/16			1 1/2x1 1/2x1/8			1 1/2x1 1/2x1/8			1 3/4x1 3/4x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	-0.01	0.01	0.09	0	0.05	0.02	0.02	0.05	0	0.03	-0.07	0.01	0.02	0.01	0	0.02	0.03	0
Actual Load	0.09			0.07			0.07			-0.03			0.03			0.05		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 48 °F, Room 70 °F, Instrument 76 °F | Date: Oct.8th 1964 | Time: Initial Zero Reading 12 45, Load Reading 12 55, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1605 | Position of Gage: 0, 1, 2

Gage Number	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15	B 16	B 17	B 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	2	1	0	-0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	005	005	001	-003	-002	-001	000	-003	-003	-003	-001	-001	000	002	002	001	001	001
Microinches: Load Reading	-005	021	020	-076	-051	-052	-046	-069	-083	004	012	006	023	-001	-011	018	018	-008
Microinches: Difference	-010	016	019	-073	-049	-051	-046	-066	-080	007	013	007	023	-003	-013	017	017	-009
Kips/in² x (-1)	0.30	-0.48	-0.57	2.19	1.47	1.53	1.38	1.98	2.40	-0.21	-0.39	-0.21	-0.69	0.09	0.39	-0.51	-0.51	0.27
Section	1 3/4 x 1 3/4 x 3/16			1 1/2 x 1 1/2 x 1/8			1 1/2 x 1 1/2 x 1/8			1 3/4 x 1 3/4 x 3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.06	-0.12	-0.10	0.21	0.22	0.18	0.16	0.30	0.23	-0.04	-0.10	-0.04	-0.06	0.01	0.03	-0.03	-0.04	0.02
Actual Load	-0.16			0.61			0.69			-0.17			-0.02			-0.05		

Temperatures: Outside 48 °F, Room 70 °F, Instrument 76 °F | Date: Oct.8th 1964 | Time: Initial Zero Reading 12 45, Load Reading 12 55, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1605 | Position of Gage: 0, 1, 2

Gage Number	B 19	B 20	B 21	B 22	B 23	B 24	B 25	B 26	B 27	B 28	B 29	B 30	B 31	B 32	B 33	B 34	B 35	B 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	000	000	-001	000	-001	-004	000	000	001	003	001	505	-002	-004	000	496	-002	-004
Microinches: Load Reading	-006	-030	-033	096	070	044	060	051	073	003	-001	523	002	-017	-006	510	-005	-029
Microinches: Difference	-006	-030	-032	096	071	048	060	051	072	000	-002	018	004	-013	-006	014	-003	-025
Kips/in² x (-1)	0.18	0.90	0.96	-2.88	-2.13	-1.44	-1.80	-1.53	-2.16	0	0.06	-0.54	-0.12	0.39	0.18	-0.42	0.09	0.75
Section	1 3/4 x 1 3/4 x 3/16			1 1/2 x 1 1/2 x 1/8			1 1/2 x 1 1/2 x 1/8			1 3/4 x 1 3/4 x 3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.04	0.22	0.17	-0.27	-0.32	-0.17	-0.21	-0.23	-0.20	0	0.01	-0.11	-0.01	0.03	0.01	-0.03	0.01	0.06
Actual Load	0.43			-0.76			-0.64			-0.10			0.03			0.04		

Temperatures: Outside 62 °F, Room 73 °F, Instrument 76.5 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 2 10, Load Reading 2 28, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15	B 16	B 17	B 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	003	002	006	005	002	001	000	002	001	000	-001	001	001	001	002	002	001	001
Microinches: Load Reading	030	006	-021	077	031	036	028	039	073	-026	-007	013	-007	-005	007	-004	-009	-003
Microinches: Difference	027	004	-027	072	029	035	028	037	072	-026	-006	012	-008	-006	005	-006	-010	-004
Kips/in²	0.81	0.12	-0.81	2.16	0.87	1.05	0.84	1.11	2.16	-0.78	-0.18	0.36	-0.24	-0.18	0.15	-0.18	-0.30	-0.12
Section	1 3/4 x 1 3/4 x 3/16			1 1/2 x 1 1/2 x 1/8			1 1/2 x 1 1/2 x 1/8			1 3/4 x 1 3/4 x 3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.16	0.03	-0.14	0.20	0.13	0.12	0.10	0.17	0.20	-0.13	-0.04	0.07	-0.02	-0.01	0.01	-0.01	-0.02	-0.01
Actual Load	0.05			0.45			0.47			-0.10			-0.02			-0.04		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures: Outside 62 °F, Room 73 °F, Instrument 76.5 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 2 10, Load Reading 2 28, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number	B 19	B 20	B 21	B 22	B 23	B 24	B 25	B 26	B 27	B 28	B 29	B 30	B 31	B 32	B 33	B 34	B 35	B 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2
Microinches: Zero Reading	-001	-004	-005	005	-001	000	001	003	-002	000	-002	497	-006	-003	-006	501	-004	-001
Microinches: Load Reading	000	012	044	-073	-033	-026	-021	-002	-045	018	-015	471	005	013	006	498	010	016
Microinches: Difference	001	016	049	078	-032	-026	-022	-005	-043	018	-013	-026	011	016	012	-003	014	017
Kips/in²	0.03	0.48	1.47	-2.34	-0.96	-0.78	-0.66	-0.15	-1.29	0.54	-0.39	-0.78	0.33	0.48	0.36	-0.09	0.42	0.51
Section	1 3/4 x 1 3/4 x 3/16			1 1/2 x 1 1/2 x 1/8			1 1/2 x 1 1/2 x 1/8			1 3/4 x 1 3/4 x 3/16			1x1x1/8			1x1x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2
	.202	.244	.173	.094	.151	.116	.116	.151	.094	.173	.244	.202	.035	.078	.067	.067	.078	.035
Kips	0.01	0.12	0.25	-0.22	-0.15	-0.09	-0.08	-0.02	-0.12	0.09	-0.10	-0.16	0.03	0.04	0.02	-0.01	0.03	0.04
Actual Load	0.38			-0.46			-0.22			-0.17			0.09			0.06		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 55 °F, Room 71 °F, Instrument 75 °F | Date: Oct.3rd 1964 | Time: Initial Zero Reading 3 10, Load Reading 4 35, Final Zero Reading | Type of Test Load: Longitudinal load at conductor suspension point, Load in Pounds 2305 | Position of Gage: 0, 1, 2

Gage Number	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	C 16	C 17	C 18	C 19	C 20	C 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0
Microinches: Zero Reading	002	005	005	004	006	005	006	002	005	005	004	005	007	005	005	007	005	005	004	005	001
Microinches: Load Reading	011	002	-002	100	124	001	024	-003	-032	036	-012	-014	-012	-124	-082	024	002	-023	006	-033	-049
Microinches: Difference	009	-003	-007	096	118	-006	018	-005	-037	031	-016	-019	-019	-129	-087	017	-003	-028	002	-038	-050
Kips/in²	0.27	-0.09	-0.21	2.88	3.54	-0.18	0.54	-0.15	-1.11	0.93	-0.48	-0.57	-0.57	-3.87	-2.61	0.51	-0.09	-0.84	0.06	-1.14	-1.53
Section	2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼			1x1x⅛		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o
	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381	.483	.327	.035	.078	.067
Kips	0.09	-0.04	-0.06	0.58	0.87	-0.03	0.05	-0.01	-0.07	0.06	-0.04	-0.05	-0.10	-0.95	-0.53	0.20	-0.04	-0.28	0.01	-0.09	-0.10
Actual Load	-0.03			1.43			-0.03			-0.03			-1.58			-0.12			-0.18		

Temperatures: Outside 55 °F, Room 71 °F, Instrument 75 °F | Date: Oct.3rd 1964 | Time: Initial Zero Reading 3 10, Load Reading 4 35, Final Zero Reading | Type of Test Load: Longitudinal load at conductor suspension point, Load in Pounds 2305 | Position of Gage: 0, 1, 2

Gage Number	C 22	C 23	C 24	C 25	C 26	C 27	C 28	C 29	C 30	C 31	C 32	C 33	C 34	C 35	C 36	C 37	C 38	C 39	C 40		
Test Channel	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Position of Gage	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2		
Microinches: Zero Reading	001	003	002	000	000	000	005	-001	004	004	002	003	002	003	004	001	003	002	004		
Microinches: Load Reading	018	-013	001	-180	-127	-165	-169	-179	-188	-028	-076	-077	058	069	046	063	204	171	167		
Microinches: Difference	017	-016	-001	-180	-127	-165	-174	-178	-192	-032	-078	-080	056	066	042	062	201	169	163		
Kips/in²	0.51	-0.48	-0.03	-5.40	-3.88	-4.95	-5.22	-5.34	-5.76	-0.96	-2.34	-2.40	1.68	1.98	1.26	1.86	6.03	5.07	4.89		
Section	1x1x⅛			2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2
	.067	.078	.035	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381		
Kips	0.03	-0.04	0	-1.76	-1.87	-1.89	-1.06	-1.30	-1.00	-0.08	-0.18	-0.16	0.11	0.15	0.11	0.32	1.48	1.04			
Actual Load	-0.01			-5.58			-3.36			-0.42			0.37			2.84					

Temperatures: Outside 60 °F, Room 68 °F, Instrument 75 °F | Date: Oct.12th 1964 | Time: Initial Zero Reading 8 25, Load Reading 8 40, Final Zero Reading | Type of Test Load: Longitudinal load at conductor suspension point, Load in Pounds 2255 | Position of Gage: 0, 1, 2

Gage Number	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	C 16	C 17	C 18	C 19	C 20	C 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0
Microinches: Zero Reading	001	-003	001	-002	000	-003	000	-002	-001	-004	-002	000	000	000	001	001	000	000	001	-001	000
Microinches: Load Reading	025	016	010	097	111	-001	025	011	-017	034	-014	-007	018	-102	-061	026	-005	-035	014	-024	-032
Microinches: Difference	024	019	009	099	111	002	025	013	-016	038	-012	-007	018	-102	-062	025	-005	-035	013	-023	-032
Kips/in²	0.72	0.57	0.27	2.97	3.33	0.06	0.75	0.39	-0.48	1.14	-0.36	-0.21	0.54	-2.06	-1.86	0.75	-0.15	-1.05	0.39	-0.69	-0.96
Section	2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼			1x1x⅛		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o
	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381	.483	.327	.035	.078	.067
Kips	0.24	0.28	0.10	0.60	0.81	0.01	0.06	0.03	-0.03	0.08	-0.03	-0.02	0.09	-0.75	-0.38	0.29	-0.07	-0.34	0.03	-0.05	-0.07
Actual Load	0.62			1.42			0.06			0.03			-1.04			-0.12			-0.09		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures: Outside 60 °F, Room 66 °F, Instrument 75 °F | Date: Oct.12th 1964 | Time: Initial Zero Reading 8 25, Load Reading 8 40, Final Zero Reading | Type of Test Load: Longitudinal load at conductor suspension point, Load in Pounds 2255 | Position of Gage: 0, 1, 2

Gage Number	C 22	C 23	C 24	C 25	C 26	C 27	C 28	C 29	C 30	C 31	C 32	C 33	C 34	C 35	C 36	C 37	C 38	C 39	C 40		
Test Channel	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Position of Gage	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2		
Microinches: Zero Reading	-001	000	-001	001	000	-002	000	000	-001	000	-001	-002	001	002	002	000	-001	000	000		
Microinches: Load Reading	024	-012	010	-181	-128	-152	-177	-170	-177	-022	-068	-069	074	089	069	071	228	186	180		
Microinches: Difference	025	-012	011	-182	-128	-150	-177	-170	-176	-022	-067	-067	073	087	067	071	229	186	180		
Kips/in²	0.75	-0.36	0.33	-5.46	-3.84	-4.50	-5.31	-5.10	-5.28	-0.66	-2.01	-2.01	2.19	2.61	2.01	2.13	6.87	5.58	5.40		
Section	1x1x⅛			2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2
	.067	.078	.035	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381		
Kips	0.05	-0.03	0.03	-1.79	-1.86	-1.71	-1.07	-1.24	-0.97	-0.06	-0.16	-0.13	0.15	0.20	0.17	0.37	1.68	1.13			
Actual Load	0.05			-5.36			-3.28			-0.35			0.52			3.18					

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 59 °F Room 68 °F Instrument 75 °F	Oct.12th 1964	Initial Zero Reading 8 25 Load Reading 8 50 Final Zero Reading	Combined longitudinal and transverse load at conductor suspension point Load in Pounds 2255 longit. 2350 transv.	0, 1, 2

Gage Number	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	C 16	C 17	C 18	C 19	C 20	C 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0
Microinches: Zero Reading	001	-003	001	-002	000	-003	000	-002	-001	-004	-002	000	000	000	001	001	000	000	001	-001	000
Microinches: Load Reading	096	089	065	-072	-062	-030	000	-010	000	007	-041	-021	-145	-277	-195	018	069	039	011	-036	-042
Microinches: Difference	095	092	064	-070	-062	-027	000	-008	001	011	-039	-021	-145	-277	-196	017	069	039	010	-035	-042
Kips/in²	2.85	2.76	1.92	-2.10	-1.86	-0.81	0	-0.24	0.03	0.33	-1.17	-0.63	-4.35	-8.31	-5.88	0.51	2.07	1.17	0.30	-1.05	-1.26
Section	2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼			1x1x⅛		
Coefficients	f_0	f_1	f_2	f_2	f_1	f_0	f_2	f_1	f_0	f_0	f_1	f_2	f_0	f_1	f_2	f_2	f_1	f_0	f_2	f_1	f_0
	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381	.483	.327	.035	.078	.067
Kips	0.93	1.33	0.73	-0.42	-0.45	-0.14	0	-0.02	0	0.02	-0.09	-0.05	-0.75	-2.03	-1.19	0.20	1.00	0.38	0.03	-0.08	-0.08
Actual Load	2.99			-1.01			-0.02			-0.12			-3.97			1.58			-0.13		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 59 °F Room 68 °F Instrument 75 °F	Oct.12th 1964	Initial Zero Reading 8 25 Load Reading 8 50 Final Zero Reading	Combined longitudinal and transverse load at conductor suspension point Load in Pounds 2255 longit. 2350 transv.	0, 1, 2

Gage Number	C 22	C 23	C 24	C 25	C 26	C 27	C 28	C 29	C 30	C 31	C 32	C 33	C 34	C 35	C 36	C 37	C 38	C 39	C 40		
Test Channel	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Position of Gage	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2		
Microinches: Zero Reading	-001	000	-001	001	000	-002	000	000	-001	000	-001	-002	001	002	002	000	-001	000	000		
Microinches: Load Reading	007	062	001	-264	-215	-218	-019	-004	030	-026	-034	-019	064	088	074	130	337	300	127		
Microinches: Difference	008	062	002	-265	-215	-216	-019	-004	031	-026	-033	-017	063	086	072	130	338	300	127		
Kips/in²	0.24	1.86	0.06	-7.95	-6.45	-6.48	-0.57	-0.12	0.93	-0.78	-0.99	-0.51	1.89	2.58	2.16	3.90	10.14	9.00	3.81		
Section	1x1x⅛			2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼		
Coefficients	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2
	.067	.078	.035	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381		
Kips	0.02	0.15	0.01	-2.60	-3.12	-2.47	-0.12	-0.03	0.19	-0.07	-0.08	-0.03	0.13	0.20	0.18	0.67	2.72	1.82			
Actual Load	0.18			-8.19			0.04			-0.18			0.51			5.21					

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 58 °F Room 67 °F Instrument 75 °F	Oct.12th 1964	Initial Zero Reading 8 25 Load Reading Final Zero Reading 9 17	Zero control reading Load in Pounds No load	0, 1, 2

Gage Number	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	C 16	C 17	C 18	C 19	C 20	C 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0
Microinches: Zero Reading	001	-003	001	-002	000	-003	000	-002	-001	-004	-002	000	000	000	001	001	000	000	001	-001	000
Microinches: Load Reading	003	-001	007	003	001	001	004	003	006	014	009	002	016	000	014	006	000	002	000	002	004
Microinches: Difference	002	002	006	005	001	004	004	005	007	018	011	002	016	000	013	005	000	002	-001	003	004
Kips/in²	0.06	0.06	0.18	0.15	0.03	0.12	0.12	0.15	0.21	0.54	0.33	0.06	0.48	0	0.39	0.15	0	0.06	-0.03	0.09	0.12
Section	2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼			1x1x⅛		
Coefficients	f_0	f_1	f_2	f_2	f_1	f_0	f_2	f_1	f_0	f_0	f_1	f_2	f_0	f_1	f_2	f_2	f_1	f_0	f_2	f_1	f_0
	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381	.483	.327	.035	.078	.067
Kips	0.02	0.03	0.07	0.03	0.01	0.02	0.01	0.01	0.01	0.04	0.03	0.01	0.05	0	0.07	0.06	0	0.02	0	0.01	0.01
Actual Load	0.12			0.06			0.03			0.08			0.15			0.08			0.02		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 58 °F Room 67 °F Instrument 75 °F	Oct.12th 1964	Initial Zero Reading 8 25 Load Reading Final Zero Reading 9 17	Zero control reading Load in Pounds No load	0, 1, 2

Gage Number	C 22	C 23	C 24	C 25	C 26	C 27	C 28	C 29	C 30	C 31	C 32	C 33	C 34	C 35	C 36	C 37	C 38	C 39	C 40		
Test Channel	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Position of Gage	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2		
Microinches: Zero Reading	-001	000	-001	001	000	-002	000	000	-001	000	-001	-002	001	002	002	000	-001	000	000		
Microinches: Load Reading	-004	014	-002	005	005	001	000	-002	011	-002	005	009	009	009	003	002	005	003	006		
Microinches: Difference	-003	014	-001	004	005	003	000	-002	012	-002	006	011	008	007	001	002	006	003	006		
Kips/in²	-0.09	0.42	-0.03	0.12	0.15	0.09	0	-0.06	0.36	-0.06	0.18	0.33	0.24	0.21	0.03	0.06	0.18	0.09	0.18		
Section	1x1x⅛			2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼		
Coefficients	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2
	.067	.078	.035	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381		
Kips	-0.01	0.03	0	0.04	0.07	0.03	0	-0.01	0.06	-0.01	0.01	0.02	0.02	0.02	0	0.01	0.04	0.02			
Actual Load	0.02			0.14			0.05			0.02			0.04			0.07					

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 43 °F, Room 68 °F, Instrument 72 °F
Date: Oct.10th 1964
Time: Initial Zero Reading 8 04; Load Reading 8 35; Final Zero Reading
Type of Test Load: Transverse load at three conductor suspension points. Load in Pounds 3022
Position of Gage: 0, 1, 2

Gage Number	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	C 16	C 17	C 18	C 19	C 20	C 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0
Microinches: Zero Reading	003	004	003	001	000	001	-003	001	000	000	002	002	001	000	-001	000	-002	000	003	000	004
Microinches: Load Reading	108	113	088	-215	-226	-016	-027	-019	031	-046	-040	-009	-208	-197	-164	-009	103	101	008	-008	001
Microinches: Difference	105	109	085	-216	-226	-017	-024	-020	031	-046	-042	-011	-209	-197	-163	-009	105	101	005	-008	-003
Kips/in^2	3.15	3.27	2.55	-6.48	-5.78	-0.51	-0.72	-0.60	0.93	-1.38	-1.26	-0.33	-5.27	-5.91	-4.89	-0.27	3.15	3.03	0.15	-0.24	-0.09
Section	2½x2½x¼			1¾x1¾x3/16			1x1x1/8			1x1x1/8			1¾x1¾x3/16			2½x2½x¼			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o
	.327	.463	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381	.463	.327	.035	.078	.067
Kips	1.03	1.58	0.97	-1.31	-1.65	-0.09	-0.06	-0.05	0.06	-0.09	-0.10	-0.03	-1.09	-1.44	-0.98	-0.10	1.53	0.99	0.01	-0.02	0
Actual Load	3.58			-3.05			-0.05			-0.22			-3.51			2.42			-0.01		

Temperatures: Outside 43 °F, Room 68 °F, Instrument 72 °F
Date: Oct.10th 1964
Time: Initial Zero Reading 8 04; Load Reading 8 35; Final Zero Reading
Type of Test Load: Transverse load at three conductor suspension points. Load in Pounds 3022
Position of Gage: 0, 1, 2

Gage Number	C 22	C 23	C 24	C 25	C 26	C 27	C 28	C 29	C 30	C 31	C 32	C 33	C 34	C 35	C 36	C 37	C 38	C 39	C 40		
Test Channel	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Position of Gage	0	1	2	0	1	2	2	1	[illegible]	2	1	0	0	1	2	0	1	2	2		
Microinches: Zero Reading	002	002	001	003	003	003	001	001	002	000	-001	002	001	001	001	000	000	000	002		
Microinches: Load Reading	-015	081	000	-094	-112	-074	190	203	232	000	033	047	-020	005	035	093	199	183	-076		
Microinches: Difference	-017	079	-001	-097	-115	-077	189	202	230	000	034	045	-021	004	034	093	199	183	-078		
Kips/in^2	-0.51	2.37	-0.03	-2.91	-3.45	-2.31	5.67	6.06	6.90	0	1.02	1.35	-0.63	0.12	1.02	2.79	5.97	5.49	-2.34		
Section	1x1x1/8			2½x2½x¼			1¾x1¾x3/16			1x1x1/8			1x1x1/8			1¾x1¾x3/16			2½x2½x¼		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2
	.067	.078	.035	.327	.463	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	381		
Kips	-0.03	0.19	0	-0.95	-1.67	-0.88	1.15	1.48	1.20	0	0.08	0.09	-0.04	0.01	0.09	0.48	1.46	1.11			
Actual Load	0.16			-3.50			3.83			0.17			0.06			3.05					

Temperatures: Outside 59 °F, Room 67 °F, Instrument 75 °F
Date: Oct.12th 1964
Time: Initial Zero Reading 8 25; Load Reading 9 05; Final Zero Reading
Type of Test Load: Transverse load at conductor suspension point. Load in Pounds 2350
Position of Gage: 0, 1, 2

Gage Number	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	C 16	C 17	C 18	C 19	C 20	C 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0
Microinches: Zero Reading	001	-003	001	-002	000	-003	000	-002	-001	-004	-002	000	000	000	001	001	000	000	001	-001	000
Microinches: Load Reading	082	082	069	-165	-173	-019	-019	-017	021	-016	-019	-009	-148	-159	-120	000	075	073	000	-010	-008
Microinches: Difference	081	085	068	-163	-173	-016	-019	-015	025	-012	-017	-009	-148	-159	-121	-001	075	073	-001	-011	-008
Kips/in^2	2.43	2.55	2.04	-4.89	-5.19	-0.48	-0.57	-0.45	0.75	-0.36	-0.51	-0.27	-4.44	-4.77	-3.63	-0.03	2.25	2.19	-0.03	-0.33	-0.24
Section	2½x2½x¼			1¾x1¾x3/16			1x1x1/8			1x1x1/8			1¾x1¾x3/16			2½x2½x¼			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o
	.327	.463	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381	.463	.327	.035	.078	.067
Kips	0.80	1.23	0.78	-0.98	-1.27	-0.08	-0.05	-0.04	0.05	-0.02	-0.04	-0.02	-0.77	-1.16	-0.73	-0.01	1.09	0.72	0	-0.03	-0.02
Actual Load	2.81			-2.33			-0.04			-0.08			-2.66			1.80			-0.05		

Multiply (Kips/in^2) by -1 when initial zero was read with test load on.

Temperatures: Outside 59 °F, Room 67 °F, Instrument 75 °F
Date: Oct.12th 1964
Time: Initial Zero Reading 8 25; Load Reading 9 05; Final Zero Reading
Type of Test Load: Transverse load at conductor suspension point. Load in Pounds 2350
Position of Gage: 0, 1, 2

Gage Number	C 22	C 23	C 24	C 25	C 26	C 27	C 28	C 29	C 30	C 31	C 32	C 33	C 34	C 35	C 36	C 37	C 38	C 39	C 40		
Test Channel	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Position of Gage	0	1	2	0	1	2	2	1	[illegible]	2	1	0	0	1	2	0	1	2	2		
Microinches: Zero Reading	-001	000	-001	001	000	-002	000	000	-001	000	-001	-002	001	002	002	000	-001	000	000		
Microinches: Load Reading	-014	080	-006	-075	-081	-060	148	157	191	000	035	047	002	014	016	055	132	129	-045		
Microinches: Difference	-013	080	-005	-076	-081	-058	148	157	192	000	036	049	001	012	014	055	133	129	-045		
Kips/in^2	-0.39	2.40	-0.15	-2.28	-2.43	-1.74	4.44	4.71	5.76	0	1.08	1.47	0.03	0.36	0.42	1.65	3.99	3.87	-1.35		
Section	1x1x1/8			2½x2½x¼			1¾x1¾x3/16			1x1x1/8			1x1x1/8			1¾x1¾x3/16			2½x2½x¼		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2
	.067	.078	.035	.327	.463	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	381		
Kips	-0.03	0.19	-0.01	-0.74	-1.17	-0.66	0.90	1.15	1.00	0	0.08	0.10	0	0.03	0.04	0.29	0.97	0.78			
Actual Load	0.15			-2.57			3.05			0.18			0.07			2.04					

Multiply (Kips/in^2) by -1 when initial zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 51 °F, Room 73 °F, Instrument 76 °F | Date: Oct.6th 1964 | Time: Initial Zero Reading 9 20, Load Reading 9 27, Final Zero Reading | Type of Test Load: Longitudinal load at ground wire suspension point, Load in Pounds 2505 | Position of Gage 0, 1, 2

Gage Number	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	C 16	C 17	C 18	C 19	C 20	C 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0
Microinches: Zero Reading	-003	-004	000	-001	-001	-001	001	003	003	003	004	004	002	002	002	-003	-001	000	000	000	001
Load Reading	005	020	037	-027	-049	013	-010	024	043	-054	-005	004	005	123	072	-015	-063	-033	-014	024	033
Difference	008	024	037	-026	-048	014	-011	021	040	-057	-009	000	003	121	070	-012	-062	-033	-014	024	032
Kips/in^2 x (-1)	-0.24	-0.72	-1.11	0.78	1.44	-0.42	0.33	-0.63	-1.20	1.71	0.27	0	-0.09	-3.63	-2.10	0.36	1.86	0.99	-0.42	-0.72	-0.96
Section	2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼			1x1x⅛		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o
	.327	.453	.331	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381	.453	.327	.035	.078	.067
Kips	-0.08	-0.35	-0.42	0.16	0.35	-0.07	-0.03	-0.04	-0.08	0.12	0.02	0	-0.01	-0.89	-0.43	0.13	0.90	0.31	0.04	-0.06	-0.06
Actual Load	-0.85			0.44			-0.09			0.14			-1.33			1.34			-0.08		

Temperatures: Outside 51 °F, Room 73 °F, Instrument 76 °F | Date: Oct.6th 1964 | Time: Initial Zero Reading 9 20, Load Reading 9 27, Final Zero Reading | Type of Test Load: Longitudinal load at ground wire Suspension point, Load in Pounds 2505 | Position of Gage 0, 1, 2

Gage Number	C 22	C 23	C 24	C 25	C 26	C 27	C 28	C 29	C 30	C 31	C 32	C 33	C 34	C 35	C 36	C 37	C 38	C 39	C 40		
Test Channel	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Position of Gage	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2		
Microinches: Zero Reading	-001	002	004	001	003	002	002	004	001	000	000	000	-002	001	000	-001	002	000			
Load Reading	-018	-049	003	222	211	223	140	136	167	012	070	082	-079	-083	-056	-080	-217	-194			
Difference	-017	-051	-001	221	208	221	138	132	166	012	070	082	-077	-084	-056	-079	-219	-194			
Kips/in^2 x (-1)	0.51	1.53	0.03	-6.63	-6.24	-6.63	-4.14	-3.96	-4.98	-0.36	-2.10	-2.46	2.31	2.52	1.68	2.37	6.57	5.82			
Section	1x1x⅛			2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2
	.067	.078	.035	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381		
Kips	0.03	0.12	0	-2.16	-3.00	-2.52	-0.84	-0.96	-0.86	-0.03	-0.16	-0.16	0.15	0.20	0.14	0.41	1.59	1.18			
Actual Load	0.15			-7.68			-2.66			-0.35			0.49			3.18					

Temperatures: Outside 60 °F, Room 71 °F, Instrument 77 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 12 2o, Load Reading 12 40, Final Zero Reading | Type of Test Load: Longitudinal load at ground wire suspension point, Load in Pounds 2455 | Position of Gage 0, 1, 2

Gage Number	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	C 16	C 17	C 18	C 19	C 20	C 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0
Microinches: Zero Reading	-003	-004	-004	-004	-003	-005	-005	-003	-004	-001	000	002	002	002	600	-001	000	-001	002	003	002
Load Reading	-007	-020	-035	031	048	-016	011	-017	-038	062	010	000	011	-122	-072	007	055	027	015	-017	-025
Difference	-004	-016	-031	035	051	-011	016	-014	-034	063	010	-002	009	-124	-072	008	055	028	013	-020	-027
Kips/in^2	-0.12	-0.48	-0.93	1.05	1.53	-0.33	0.48	-0.42	-1.02	1.89	0.30	-0.06	0.27	-3.72	-2.16	0.24	1.65	0.84	0.39	-0.60	-0.81
Section	2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼			1x1x⅛		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o
	.327	.453	.331	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381	.453	.327	.035	.078	.067
Kips	-0.04	-0.22	-0.35	0.21	0.37	-0.08	0.04	-0.03	-0.07	0.12	0.02	-0.01	0.05	-0.91	-0.44	0.09	0.80	0.27	0.03	-0.05	-0.05
Actual Load	-0.61			0.50			-0.06			0.13			-1.30			1.16			-0.07		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures: Outside 60 °F, Room 71 °F, Instrument 77 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 12 20, Load Reading 12 40, Final Zero Reading | Type of Test Load: Longitudinal load at ground wire suspension point, Load in Pounds 2455 | Position of Gage 0, 1, 2

Gage Number	C 22	C 23	C 24	C 25	C 26	C 27	C 28	C 29	C 30	C 31	C 32	C 33	C 34	C 35	C 36	C 37	C 38	C 39	C 40		
Test Channel	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Position of Gage	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2		
Microinches: Zero Reading	002	000	000	002	003	002	000	-004	-002	-001	-002	-003	-003	-001	000	000	000	-003			
Load Reading	014	058	003	-224	-215	-227	-138	-137	-160	-016	-072	-081	085	096	067	085	238	200			
Difference	012	058	003	-226	-218	-229	-138	-133	-158	-015	-070	-078	088	097	067	085	238	203			
Kips/in^2	0.36	1.74	0.09	-6.78	-6.54	-6.87	-4.14	-3.99	-4.74	-0.45	-2.10	-2.34	2.64	2.91	2.01	2.55	7.14	6.09			
Section	1x1x⅛			2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2
	.067	.078	.035	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381		
Kips	0.02	0.14	0.01	-2.22	-3.16	-2.62	-0.84	-0.97	-0.82	-0.04	-0.16	-0.16	0.18	0.23	0.17	0.44	1.74	1.24			
Actual Load	0.17			-8.00			-2.63			-0.36			0.58			3.42					

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 60 °F, Room 71 °F, Instrument 77 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 12 20, Load Reading 12 52, Final Zero Reading | Type of Test Load: Combined longitudinal and transverse load at ground wire suspension point. Load in Pounds 2455 longit. 1100 transv. | Position of Gage: 0, 1, 2

Gage Number	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	C 16	C 17	C 18	C 19	C 20	C 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0
Microinches: Zero Reading	-003	-004	-004	-004	-003	-005	-005	-003	-004	-004	000	002	002	002	000	-001	000	-001	002	003	002
Microinches: Load Reading	035	025	000	-069	-055	-033	-007	-032	-032	043	-009	-006	-080	-222	-151	005	104	075	013	-021	-028
Microinches: Difference	038	029	004	-065	-052	-028	-002	-029	-028	044	-009	-008	-082	-224	-151	006	104	076	011	-024	-030
Kips/in²	1.14	0.87	0.12	-1.95	-1.56	-0.84	-0.06	-0.87	-0.84	1.32	-0.27	-0.24	-2.46	-6.72	-4.53	0.18	3.12	2.28	0.33	-0.72	-0.90
Section	2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼			1x1x⅛		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o
	.327	.483	.381	.202	.244	.173	.085	.078	.067	.067	.078	.085	.173	.244	.202	.381	.483	.327	.085	.078	.067
Kips	0.37	0.42	0.05	-0.39	-0.38	-0.15	-0.01	-0.07	-0.06	0.09	-0.02	-0.02	-0.43	-1.64	-0.92	0.07	1.51	0.75	0.03	-0.06	-0.06
Actual Load	0.84			-0.92			-0.14			0.05			-2.99			2.33			-0.09		

Temperatures: Outside 60 °F, Room 71 °F, Instrument 77 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 12 20, Load Reading 12 52, Final Zero Reading | Type of Test Load: Combined longitudinal and transverse load at ground wire suspension point. Load in Pounds 2455 longit. 1100 transv. | Position of Gage: 0, 1, 2

Gage Number	C 22	C 23	C 24	C 25	C 26	C 27	C 28	C 29	C 30	C 31	C 32	C 33	C 34	C 35	C 36	C 37	C 38	C 39	C 40		
Test Channel	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Position of Gage	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2		
Microinches: Zero Reading	002	000	000	002	003	002	000	-004	-002	-001	-002	-003	-003	-001	000	000	000	-003			
Microinches: Load Reading	010	100	000	-273	-270	-265	-050	-039	-054	-017	-060	-066	076	092	067	114	298	270			
Microinches: Difference	008	100	000	-275	-273	-267	-050	-035	-052	-016	-058	-063	079	093	067	114	298	273			
Kips/in²	0.24	3.00	0	-8.25	-8.19	-8.01	-1.50	-1.05	-1.56	-0.48	-1.74	-1.89	2.37	2.79	2.01	3.42	8.94	8.19			
Section	1x1x⅛			2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2
	.067	.078	.085	.327	.483	.381	.202	.244	.173	.085	.078	.067	.067	.078	.085	.173	.244	.202	.381		
Kips	0.02	0.23	0	-2.69	-3.96	-3.05	-0.30	-0.26	-0.27	-0.04	-0.14	-0.13	0.16	0.22	0.17	0.59	2.18	1.65			
Actual Load	0.25			-9.70			-0.83			-0.31			0.55			4.42					

Temperatures: Outside 62 °F, Room 71 °F, Instrument 77 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 12 20, Load Reading, Final Zero Reading 1 10 | Type of Test Load: Zero control reading. Load in Pounds No load | Position of Gage: 0, 1, 2

Gage Number	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	C 16	C 17	C 18	C 19	C 20	C 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0
Microinches: Zero Reading	-003	-004	-004	-004	-003	-005	-005	-003	-004	-001	000	002	002	002	000	-001	000	-001	002	003	002
Microinches: Load Reading	-007	-005	-005	-007	-005	-007	-007	-005	-004	-001	-001	-003	-002	-003	-003	-004	-006	-006	000	003	000
Microinches: Difference	-004	-001	-001	-003	-002	-002	-002	-002	000	000	-001	-005	-004	-005	-003	-003	-006	-005	-002	000	002
Kips/in²	-0.12	-0.03	-0.03	-0.09	-0.06	-0.06	-0.06	-0.06	0	0	-0.03	-0.15	-0.12	-0.15	-0.09	-0.09	-0.18	-0.15	-0.06	0	0.06
Section	2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼			1x1x⅛		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o
	.327	.483	.381	.202	.244	.173	.085	.078	.067	.067	.078	.085	.173	.244	.202	.381	.483	.327	.085	.078	.067
Kips	-0.04	-0.01	-0.01	-0.02	-0.01	-0.01	-0.01	0	0	0	0	0	-0.02	-0.04	-0.02	-0.04	-0.09	-0.05	-0.01	0	0
Actual Load	-0.06			-0.04			-0.01			0			-0.08			-0.18			-0.01		

Multiply (Kips/in²) by -1 when initial zero was read with test load on.

Temperatures: Outside 62 °F, Room 71 °F, Instrument 77 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 12 20, Load Reading, Final Zero Reading 1 10 | Type of Test Load: Zero control reading. Load in Pounds No load | Position of Gage: 0, 1, 2

Gage Number	C 22	C 23	C 24	C 25	C 26	C 27	C 28	C 29	C 30	C 31	C 32	C 33	C 34	C 35	C 36	C 37	C 38	C 39	C 40		
Test Channel	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Position of Gage	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2		
Microinches: Zero Reading	002	000	000	002	003	002	000	-004	-002	-001	-002	-003	-003	-001	000	000	000	-006			
Microinches: Load Reading	008	000	000	000	000	000	000	-002	-001	-002	-004	-005	-008	-006	-004	-006	-005	-002			
Microinches: Difference	006	000	000	-002	-003	-002	000	002	001	-001	-002	-002	-005	-005	-004	-006	-005	004			
Kips/in²	0.18	0	0	-0.06	-0.09	-0.06	0	0.06	0.03	-0.03	-0.06	-0.06	-0.15	-0.15	-0.12	-0.18	-0.15	0.12			
Section	1x1x⅛			2½x2½x¼			1¾x1¾x3/16			1x1x⅛			1x1x⅛			1¾x1¾x3/16			2½x2½x¼		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2
	.067	.078	.085	.327	.483	.381	.202	.244	.173	.085	.078	.067	.067	.078	.085	.173	.244	.202	.381		
Kips	0.01	0	0	-0.02	-0.04	-0.02	0	0.01	0.01	0	0	0	-0.01	-0.01	-0.01	-0.03	-0.04	0.02			
Actual Load	0.01			-0.08			0.02			0			-0.03			-0.05					

Multiply (Kips/in²) by -1 when initial zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 47 °F, Room 71 °F, Instrument 76 °F | Date: Oct.8th 1964 | Time: Initial Zero Reading 1 25, Load Reading 1 32, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1605 | Position of Gage: 0, 1, 2

Gage Number	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	C 16	C 17	C 18	C 19	C 20	C 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0
Microinches: Zero Reading	001	000	-001	-002	000	-001	000	000	000	-002	001	001	000	-001	-003	-002	000	-001	000	003	001
Microinches: Load Reading	067	066	048	-142	-142	-018	-021	-020	010	-033	-029	-012	-136	-130	-113	-011	063	059	-010	-014	-012
Microinches: Difference	066	066	049	-140	-142	-017	-021	-020	010	-031	-030	-013	-136	-129	-110	-009	063	060	-010	-017	-013
Kips/in²	1.98	1.98	1.47	-4.20	-4.26	-0.51	-0.63	-0.60	0.30	-0.93	-0.90	-0.39	-4.08	-3.67	-3.30	-0.27	1.89	1.80	-0.30	-0.51	-0.39
Section	2½x2½x¼			1¾x1¾x3/16			1x1x1/8			1x1x1/8			1¾x1¾x3/16			2½x2½x¼			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o
	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381	.483	.327	.035	.078	.067
Kips	0.65	0.95	0.54	-0.85	-1.04	-0.08	-0.05	-0.05	0.02	-0.06	-0.07	-0.03	-0.71	-0.94	-0.67	-0.10	0.91	0.59	-0.03	-0.04	-0.03
Actual Load	2.14			-1.97			-0.08			-0.16			-2.32			1.40			-0.10		

Temperatures: Outside 47 °F, Room 71 °F, Instrument 76 °F | Date: Oct.8th 1964 | Time: Initial Zero Reading 1 25, Load Reading 1 32, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1605 | Position of Gage: 0, 1, 2

Gage Number	C 22	C 23	C 24	C 25	C 26	C 27	C 28	C 29	C 30	C 31	C 32	C 33	C 34	C 35	C 36	C 37	C 38	C 39	C 40		
Test Channel	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Position of Gage	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2		
Microinches: Zero Reading	000	-002	000	000	000	000	000	003	002	-002	-002	-001	000	-002	000						
Microinches: Load Reading	-015	044	-008	-070	-076	-060	112	128	135	-008	017	024	-015	-003	019						
Microinches: Difference	-015	046	-008	-070	-076	-060	112	125	133	-006	019	025	-015	-001	019						
Kips/in²	-0.45	1.38	-0.24	-2.10	-2.28	-1.80	3.36	3.75	3.99	-0.18	0.57	0.75	-0.45	-0.03	0.57						
Section	1x1x1/8			2½x2½x¼			1¾x1¾x3/16			1x1x1/8			1x1x1/8			1¾x1¾x3/16			2½x2½x¼		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2
	.067	.078	.035	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381		
Kips	-0.03	0.11	-0.02	-0.69	-1.10	-0.69	0.68	0.92	0.69	-0.02	0.04	0.05	-0.03	0	0.05						
Actual Load	0.06			-2.48			2.29			0.07			0.02								

Temperatures: Outside 61 °F, Room 71 °F, Instrument 77 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 12 20, Load Reading 1 00, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	C 16	C 17	C 18	C 19	C 20	C 21
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Position of Gage	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2	1	0	2	1	0
Microinches: Zero Reading	-003	-004	-004	-004	-003	-005	-005	-003	-004	-001	000	002	002	002	000	-001	000	-001	002	003	002
Microinches: Load Reading	048	053	042	-098	-103	-014	-015	-010	014	-011	-013	-004	-085	-089	-074	-005	042	040	-001	-003	-005
Microinches: Difference	045	057	046	-094	-101	-009	-010	-007	018	-012	-013	-002	-087	-091	-074	-004	042	041	-002	-006	-007
Kips/in²	1.35	1.71	1.38	-2.82	-3.03	-0.27	-0.30	-0.21	0.54	-0.36	-0.39	-0.06	-2.61	-2.73	-2.22	-0.12	1.26	1.23	-0.06	-0.18	-0.21
Section	2½x2½x¼			1¾x1¾x3/16			1x1x1/8			1x1x1/8			1¾x1¾x3/16			2½x2½x¼			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o
	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381	.483	.327	.035	.078	.067
Kips	0.44	0.83	0.53	-0.57	-0.74	-0.05	-0.03	-0.02	0.04	-0.02	-0.03	-0.01	-0.45	-0.67	-0.45	-0.05	0.61	0.40	-0.01	-0.01	-0.01
Actual Load	1.80			-1.36			-0.01			-0.06			-1.57			0.96			-0.03		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures: Outside 61 °F, Room 71 °F, Instrument 77 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 12 20, Load Reading 1 00, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number	C 22	C 23	C 24	C 25	C 26	C 27	C 28	C 29	C 30	C 31	C 32	C 33	C 34	C 35	C 36	C 37	C 38	C 39	C 40		
Test Channel	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
Position of Gage	0	1	2	0	1	2	2	1	0	2	1	0	0	1	2	0	1	2	2		
Microinches: Zero Reading	002	000	000	002	003	002	000	-004	-002	-001	-002	-003	-003	-001	000	000	000	-003			
Microinches: Load Reading	-004	041	-002	-048	-055	-040	090	096	110	001	017	021	-005	002	009	030	071	066			
Microinches: Difference	-006	041	-002	-050	-058	-042	090	100	112	002	019	024	-002	003	009	030	071	069			
Kips/in²	-0.18	1.23	-0.06	-1.50	-1.74	-1.26	2.70	3.00	3.36	0.06	0.57	0.72	-0.06	0.09	0.27	0.90	2.13	2.07			
Section	1x1x1/8			2½x2½x¼			1¾x1¾x3/16			1x1x1/8			1x1x1/8			1¾x1¾x3/16			2½x2½x¼		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2
	.067	.078	.035	.327	.483	.381	.202	.244	.173	.035	.078	.067	.067	.078	.035	.173	.244	.202	.381		
Kips	-0.01	0.10	0	-0.49	-0.84	-0.48	0.55	0.73	0.58	0.01	0.04	0.05	0	0.09	0.02	0.16	0.52	0.42			
Actual Load	0.09			-1.81			1.86			0.10			0.11			1.10					

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 76 °F Room 79 °F Instrument 82 °F	Oct.14th 1964	Initial Zero Reading 5 50 Load Reading 6 13 Final Zero Reading	Longitudinal load at conductor suspension point Load in Pounds 2255	0 / 1 / 2

Gage Number	C 40	C 41	C 42	C 43	C 44	C 45	C 46	C 47	C 48	D 9	D 10	D 11	D 12	D 13	D 14	D 15	D 16	D 17
Test Channel	39	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Position of Gage	2	1	0	2	1	0	0	1	2	2	1	0	2	1	0	2	1	0
Microinches: Zero Reading	000	003	001	003	003	001	000	002	002	002	002	002	001	001	003	002	003	000
Load Reading	180	177	136	005	043	029	-133	-083	-010	-036	-093	-034	-015	-007	034	-011	081	030
Difference	180	174	135	002	040	028	-133	-085	-012	-038	-095	-036	-016	-008	031	-014	078	030
Kips/in^2	5.40	5.22	4.05	0.06	1.20	0.34	-3.99	-2.55	-0.36	-1.14	-2.85	-1.08	-0.48	-0.24	0.93	-0.42	2.34	0.90
Section	2½x2½x¼			1x1x1/8			1x1x1/8			2x2x1/8			2x2x1/8			2x2x1/8		
Coefficients	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_2	f_1	f_o
	.381	.481	.327	.085	.078	.067	.067	.078	.085	.146	.210	.124	.146	.210	.124	.146	.210	.124
Kips	2.06	2.52	1.32	0	0.09	0.06	-0.27	-0.20	-0.03	-0.17	-0.60	-0.13	-0.07	-0.05	0.12	-0.06	0.49	0.11
Actual Load	5.90			0.15			-0.50			-0.90			0			0.54		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 76 °F Room 79 °F Instrument 82 °F	Oct.14th 1964	Initial Zero Reading 5 50 Load Reading 6 13 Final Zero Reading	Longitudinal load at conductor suspension point Load in Pounds 2255	0 / 1 / 2

Gage Number	D 18	D 19	D 20	D 21	D 22	D 23	D 24	D 25	D 26
Test Channel	17	18	19	20	21	22	23	24	25
Position of Gage	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	002	004	003	001	003	001	002	001
Load Reading	-048	-010	067	341	198	012	-118	-231	032
Difference	-050	-012	063	338	197	009	-119	-233	032
Kips/in^2	-1.50	-0.36	1.89	10.14	5.91	0.27	-3.57	-6.99	0.96
Section	2x2x1/8			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.146	.210	.124	.094	.151	.116	.094	.151	.116
Kips	-0.22	-0.07	0.24	0.95	0.89	0.03	-0.34	-1.06	0.11
Actual Load	-0.05			1.87			-1.29		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 64 °F Room 78 °F Instrument 81 °F	Oct.24th 1964	Initial Zero Reading 1 15 Load Reading 1 25 Final Zero Reading	Longitudinal load at conductor suspension point Load in Pounds 2455	0 / 1 / 2

Gage Number	C 40	C 41	C 42	C 43	C 44	C 45	C 46	C 47	C 48	D 9	D 10	D 11	D 12	D 13	D 14	D 15	D 16	D 17
Test Channel	39	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Position of Gage	2	1	0	2	1	0	0	1	2	2	1	0	2	1	0	2	1	0
Microinches: Zero Reading	000	-002	000	001	003	000	001	001	000	001	002	000	000	000	002	001	002	000
Load Reading	174	190	139	-007	041	023	-172	-101	-015	-046	-107	-043	-013	-025	027	-005	071	034
Difference	174	192	139	-008	038	023	-173	-102	-015	-047	-109	-043	-013	-025	025	-006	069	034
Kips/in^2	5.22	5.76	4.17	-0.24	1.14	0.69	-5.19	-3.06	-0.45	-1.41	-1.27	-1.29	-0.39	-0.75	0.75	-0.18	2.07	1.02
Section	2½x2½x¼			1x1x1/8			1x1x1/8			2x2x1/8			2x2x1/8			2x2x1/8		
Coefficients	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_2	f_1	f_o
	.381	.481	.327	.085	.078	.067	.067	.078	.085	.146	.210	.124	.146	.210	.124	.146	.210	.124
Kips	1.99	2.78	1.36	-0.02	0.09	0.05	-0.35	-0.24	-0.04	-0.21	-0.69	-0.16	-0.06	-0.16	0.09	-0.03	0.44	0.13
Actual Load	6.13			0.12			-0.63			-1.06			0.13			0.54		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 64 °F Room 78 °F Instrument 81 °F	Oct.24th 1964	Initial Zero Reading 1 15 Load Reading 1 25 Final Zero Reading	Longitudinal load at conductor suspension point Load in Pounds 2455	0 / 1 / 2

Gage Number	D 18	D 19	D 20	D 21	D 22	D 23	D 24	D 25	D 26
Test Channel	17	18	19	20	21	22	23	24	25
Position of Gage	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	-002	001	001	000	001	001	001	001	000
Load Reading	-050	-021	063	366	222	007	-140	-277	036
Difference	-048	-022	062	366	222	006	-141	-278	036
Kips/in^2	-1.44	-0.66	1.66	10.98	6.66	0.18	-4.23	-8.34	1.06
Section	2x2x1/8			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.146	.210	.124	.094	.151	.116	.094	.151	.116
Kips	-0.21	-0.14	0.23	1.08	1.01	0.02	-0.40	-1.26	0.13
Actual Load	-0.12			2.11			-1.53		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 76 °F, Room 79 °F, Instrument 82 °F

Date: Oct.14th 1964

Time: Initial Zero Reading 5 50; Load Reading 6 28; Final Zero Reading

Type of Test Load: Combined longitudinal and transverse load at conductor suspension point. Load in Pounds 2255 longit. 2350 transv.

Position of Gage: 0, 1, 2

Gage Number	C 40	C 41	C 42	C 43	C 44	C 45	C 46	C 47	C 48	D 9	D 10	D 11	D 12	D 13	D 14	D 15	D 16	D 17
Test Channel	39	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Position of Gage	2	1	0	2	1	0	0	1	2	2	1	0	2	1	0	2	1	0
Microinches: Zero Reading	000	003	001	003	003	001	000	002	002	001	003	002	001	001	003	003	003	000
Microinches: Load Reading	127	106	063	008	052	039	-128	-073	-009	-031	-122	-056	017	-016	-032	-028	139	043
Microinches: Difference	127	103	062	005	049	038	-128	-075	-011	-032	-125	-058	016	-017	-035	-031	136	043
Kips/in^2	3.81	3.09	1.86	0.15	1.47	1.14	-3.84	-2.25	-0.33	-0.96	-3.75	-1.74	0.48	-0.51	-1.05	-0.93	4.08	1.29
Section	2½x2½x¼			1x1x⅛			1x1x⅛			2x2x⅛			2x2x⅛			2x2x⅛		
Coefficients	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_2	f_1	f_o
	.381	.481	.327	.085	.078	.067	.067	.078	.085	.146	.210	.124	.146	.210	.124	.146	.210	.124
Kips	1.45	1.49	0.61	0.01	0.11	0.08	-0.26	-0.18	-0.03	-0.14	-0.79	-0.22	0.07	-0.11	-0.13	-0.14	0.85	0.16
Actual Load	3.55			0.20			-0.47			-1.15			-0.17			0.87		

Temperatures: Outside 76 °F, Room 79 °F, Instrument 82 °F

Date: Oct.14th 1964

Time: Initial Zero Reading 5 50; Load Reading 6 28; Final Zero Reading

Type of Test Load: Combined longitudinal and transverse load at conductor suspension point. Load in Pounds 2255 longit. 2350 transv.

Position of Gage: 0, 1, 2

Gage Number	D 18	D 19	D 20	D 21	D 22	D 23	D 24	D 25	D 26
Test Channel	17	18	19	20	21	22	23	24	25
Position of Gage	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	002	004	003	001	003	001	002	001
Microinches: Load Reading	-090	-001	135	366	189	006	-073	-222	038
Microinches: Difference	-092	-003	131	363	188	003	-075	-224	037
Kips/in^2	-2.76	-0.09	3.93	10.89	5.64	0.09	-2.25	-6.72	1.11
Section	2x2x⅛			1½x1½x⅛			1½x1½x⅛		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.146	.210	.124	.094	.151	.116	.094	.151	.116
Kips	-0.40	-0.02	0.49	1.02	0.85	0.01	-0.21	-1.01	0.13
Actual Load	0.07			1.88			-1.09		

Temperatures: Outside 76 °F, Room 79 °F, Instrument 82 °F

Date: Oct.14th 1964

Time: Initial Zero Reading 5 50; Load Reading; Final Zero Reading 6 55

Type of Test Load: Zero control reading. Load in Pounds No load

Position of Gage: 0, 1, 2

Gage Number	C 40	C 41	C 42	C 43	C 44	C 45	C 46	C 47	C 48	D 9	D 10	D 11	D 12	D 13	D 14	D 15	D 16	D 17
Test Channel	39	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Position of Gage	2	1	0	2	1	0	0	1	2	2	1	0	2	1	0	2	1	0
Microinches: Zero Reading	000	003	001	003	003	001	000	002	002	002	002	002	001	001	003	003	003	000
Microinches: Load Reading	006	020	016	016	014	006	002	015	013	024	024	016	022	014	020	006	036	021
Microinches: Difference	006	017	015	013	011	005	002	013	011	022	022	014	021	013	017	005	033	021
Kips/in^2	0.18	0.51	0.45	0.39	0.33	0.15	0.06	0.39	0.33	0.66	0.66	0.42	0.63	0.39	0.51	0.15	0.99	0.63
Section	2½x2½x¼			1x1x⅛			1x1x⅛			2x2x⅛			2x2x⅛			2x2x⅛		
Coefficients	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_2	f_1	f_o
	.381	.481	.327	.085	.078	.067	.067	.078	.085	.146	.210	.124	.146	.210	.124	.146	.210	.124
Kips	0.07	0.24	0.15	0.03	0.03	0.01	0	0.03	0.03	0.10	0.14	0.05	0.09	0.07	0.06	0.02	0.20	0.08
Actual Load	0.46			0.07			0.06			0.29			0.22			0.30		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures: Outside 76 °F, Room 79 °F, Instrument 82 °F

Date: Oct.14th 1964

Time: Initial Zero Reading 5 50; Load Reading; Final Zero Reading 6 55

Type of Test Load: Zero control reading. Load in Pounds No load

Position of Gage: 0, 1, 2

Gage Number	D 18	D 19	D 20	D 21	D 22	D 23	D 24	D 25	D 26
Test Channel	17	18	19	20	21	22	23	24	25
Position of Gage	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	002	004	003	001	003	001	002	001
Microinches: Load Reading	003	021	022	015	-011	-005	029	016	012
Microinches: Difference	001	019	018	012	-012	-008	028	014	011
Kips/in^2	0.03	0.57	0.54	0.36	-0.36	-0.24	0.84	0.42	0.33
Section	2x2x⅛			1½x1½x⅛			1½x1½x⅛		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.146	.210	.124	.094	.151	.116	.094	.151	.116
Kips	0	0.12	0.06	0.03	-0.05	-0.03	0.08	0.06	0.04
Actual Load	0.18			-0.05			0.18		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:		Date	Time:		Type of Test Load	Position of Gage
Outside	56 °F	Oct.9th 1964	Initial Zero Reading	1 33	Transverse load at three conductor suspension points	0
Room	68 °F		Load Reading	2 05		1 2
Instrument	73 °F		Final Zero Reading		Load in Pounds 3022	

Gage Number	C 40	C 41	C 42	C 43	C 44	C 45	C 46	C 47	C 48	D 9	D 10	D 11	D 12	D 13	D 14	D 15	D 16	D 17
Test Channel	39	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Position of Gage	2	1	0	2	1	0	0	1	2	2	1	0	2	1	0	2	1	0
Microinches: Zero Reading	-010	-011	-012	-012	-015	-010	-004	-005	-005	-005	-003	-007	-006	-006	-005	-004	-004	-006
Microinches: Load Reading	-088	-123	-120	-016	-017	-007	004	001	-009	-013	-014	-022	028	-020	-079	-024	009	-002
Microinches: Difference	-078	-112	-108	-004	-002	003	008	006	-004	-008	-011	-015	034	-014	-074	-020	013	004
Kips/in^2	-2.34	-3.36	-3.24	-0.12	-0.06	0.09	0.24	0.18	-0.12	-0.24	-0.33	-0.45	1.02	-0.42	-2.22	-0.60	0.39	0.12
Section	2½x2½x¼			1x1x⅛			1x1x⅛			2x2x⅛			2x2x⅛			2x2x⅛		
Coefficients	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_2	f_1	f_o
	.381	.481	.327	.085	.078	.067	.067	.078	.085	.146	.210	.124	.146	210	.124	.146	.210	.124
Kips	-0.89	-1.63	-1.06	-0.01	0	0.01	0.02	0.01	-0.01	-0.04	-0.07	-0.06	0.15	-0.09	-0.28	-0.09	0.08	0.01
Actual Load	-3.58			0			0.02			-0.17			-0.22			0		

Temperatures:		Date	Time:		Type of Test Load	Position of Gage
Outside	56 °F	Oct.9th 1964	Initial Zero Reading	1 33	Transverse load at three conductor suspension points	0
Room	68 °F		Load Reading	2 05		1 2
Instrument	73 °F		Final Zero Reading		Load in Pounds 3022	

Gage Number	D 18	D 19	D 20	D 21	D 22	D 23	D 24	D 25	D 26
Test Channel	17	18	19	20	21	22	23	24	25
Position of Gage	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	-003	-003	-004	-012	-009	-008	-009	-011	-011
Microinches: Load Reading	-040	-005	060	-007	-031	-015	019	-017	-021
Microinches: Difference	-037	-002	064	005	-022	-007	028	-006	-010
Kips/in^2	-1.11	-0.06	1.92	0.15	-0.66	-0.21	0.84	-0.18	-0.30
Section	2x2x⅛			1½x1½x⅛			1½x1½x⅛		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.146	.210	.124	.094	.151	.116	.094	.151	.116
Kips	-0.16	-0.01	0.24	0.01	-0.10	-0.02	0.08	-0.03	-0.03
Actual Load	0.07			-0.11			0.02		

Temperatures:		Date	Time:		Type of Test Load	Position of Gage
Outside	76 °F	Oct.14th 1964	Initial Zero Reading	5 50	Transverse load at conductor suspension point	0
Room	79 °F		Load Reading	6 40		1 2
Instrument	82 °F		Final Zero Reading		Load in Pounds 2350	

Gage Number	C 40	C 41	C 42	C 43	C 44	C 45	C 46	C 47	C 48	D 9	D 10	D 11	D 12	D 13	D 14	D 15	D 16	D 17
Test Channel	39	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Position of Gage	2	1	0	2	1	0	0	1	2	2	1	0	2	1	0	2	1	0
Microinches: Zero Reading	000	003	001	003	003	001	000	002	002	002	002	002	001	001	003	003	003	000
Microinches: Load Reading	-045	-056	-057	012	010	004	003	018	006	020	-002	-007	042	-001	-052	-017	065	025
Microinches: Difference	-045	-059	-058	009	007	003	003	016	004	018	-004	-009	041	-002	-055	-020	062	025
Kips/in^2	-1.35	-1.77	-1.74	0.27	0.21	0.09	0.09	0.48	0.12	0.54	-0.12	-0.27	1.23	-0.06	-1.65	-0.60	1.86	0.75
Section	2½x2½x¼			1x1x⅛			1x1x⅛			2x2x⅛			2x2x⅛			2x2x⅛		
Coefficients	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_2	f_1	f_o
	.381	.481	.327	.085	.078	.067	.067	.078	.085	.146	.210	.124	.146	210	.124	.146	.210	.124
Kips	-0.51	-0.85	-0.57	0.02	0.02	0.01	0.01	0.04	0.01	0.08	-0.03	-0.03	0.18	-0.01	-0.21	-0.09	0.39	0.09
Actual Load	-1.93			0.05			0.06			0.02			-0.04			0.39		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures:		Date	Time:		Type of Test Load	Position of Gage
Outside	76 °F	Oct.14th 1964	Initial Zero Reading	5 50	Transverse load at conductor suspension point	0
Room	79 °F		Load Reading	6 40		1 2
Instrument	82 °F		Final Zero Reading		Load in Pounds 2350	

Gage Number	D 18	D 19	D 20	D 21	D 22	D 23	D 24	D 25	D 26
Test Channel	17	18	19	20	21	22	23	24	25
Position of Gage	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	002	004	003	001	003	001	002	001
Microinches: Load Reading	-039	025	075	030	-019	-007	057	023	003
Microinches: Difference	-041	023	071	027	-020	-010	056	021	002
Kips/in^2	-1.23	0.69	2.13	081	-0.60	-0.30	1.68	0.63	0.06
Section	2x2x⅛			1½x1½x⅛			1½x1½x⅛		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.146	.210	.124	.094	.151	.116	.094	.151	.116
Kips	-0.18	0.15	0.26	0.08	-0.09	-0.03	0.16	0.09	0.01
Actual Load	0.23			-0.04			0.26		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 51 °F Room 72 °F Instrument 76 °F	Oct.6th 1964	Initial Zero Reading 8 30 Load Reading 8 45 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2505	0 1 2

Gage Number	C 40	C 41	C 42	C 43	C 44	C 45	C 46	C 47	C 48	D 9	D 10	D 11	D 12	D 13	D 14	D 15	D 16	D 17
Test Channel	39	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Position of Gage	2	1	0	2	1	0	0	1	2	2	1	0	2	1	0	2	1	0
Microinches: Zero Reading	-003	003	004	004	004	001	002	004	001	000	001	004	002	000	005	003	002	000
Microinches: Load Reading	207	198	169	022	006	-006	-016	-010	005	-063	-134	-055	009	004	019	036	142	089
Microinches: Difference	210	195	165	018	002	-007	-018	-014	004	-063	-135	-059	007	004	014	033	140	089
Kips/in^2	6.30	5.85	4.95	0.54	0.06	-0.21	-0.54	-0.42	0.12	-1.89	-4.05	-1.77	0.21	0.12	0.42	0.99	4.20	2.67
Section	$2\frac{1}{2}x2\frac{1}{2}x\frac{1}{4}$			1x1x$\frac{1}{8}$			1x1x$\frac{1}{8}$			2x2x$\frac{1}{8}$			2x2x$\frac{1}{8}$			2x2x$\frac{1}{8}$		
Coefficients	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_2	f_1	f_o
	.381	.481	.327	.085	.078	.067	.067	.078	.085	.146	.210	.124	.146	210	.124	.146	.210	.124
Kips	2.40	2.83	1.61	0.05	0	-0.01	-0.04	-0.03	0.01	-0.28	-0.85	-0.22	0.03	0.03	0.05	0.14	0.84	0.33
Actual Load	6.84			0.04			-0.06			-1.35			0.11			1.31		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 51 °F Room 72 °F Instrument 76 °F	Oct.6th 1964	Initial Zero Reading 8 30 Load Reading 8 45 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2505	0 1 2

Gage Number	D 18	D 19	D 20	D 21	D 22	D 23	D 24	D 25	D 26
Test Channel	17	18	19	20	21	22	23	24	25
Position of Gage	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	002	002	001	001	001	002	000	-002
Microinches: Load Reading	-018	-008	039	272	170	006	-127	-240	024
Microinches: Difference	-020	-010	037	271	169	005	-129	-240	026
Kips/in^2	-0.60	-0.30	1.11	8.13	5.07	0.15	-3.87	-7.20	0.78
Section	2x2x$\frac{1}{8}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.146	.210	.124	.094	.151	.116	.094	.151	.116
Kips	-0.09	-0.06	0.14	0.76	0.77	0.02	0.36	-1.07	0.09
Actual Load	-0.01			1.55			-1.34		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 57 °F Room 73 °F Instrument 76 °F	Oct.17th 1964	Initial Zero Reading 11 35 Load Reading 11 42 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2455	0 1 2

Gage Number	C 40	C 41	C 42	C 43	C 44	C 45	C 46	C 47	C 48	D 9	D 10	D 11	D 12	D 13	D 14	D 15	D 16	D 17
Test Channel	39	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Position of Gage	2	1	0	2	1	0	0	1	2	2	1	0	2	1	0	2	1	0
Microinches: Zero Reading	001	004	003	000	001	001	004	002	002	002	002	002	001	004	003	000	002	001
Microinches: Load Reading	222	205	172	011	000	-010	-009	-005	008	-068	-154	-068	002	-004	013	015	134	069
Microinches: Difference	221	201	169	011	-001	-011	-013	-007	006	-070	-156	-070	001	-008	010	015	132	068
Kips/in^2	6.63	6.03	5.07	0.33	-0.03	-0.33	-0.39	-0.21	0.18	-2.10	-4.68	-2.10	0.03	-0.24	0.30	0.45	3.96	2.04
Section	$2\frac{1}{2}x2\frac{1}{2}x\frac{1}{4}$			1x1x$\frac{1}{8}$			1x1x$\frac{1}{8}$			2x2x$\frac{1}{8}$			2x2x$\frac{1}{8}$			2x2x$\frac{1}{8}$		
Coefficients	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_2	f_1	f_o
	.381	.481	.327	.085	.078	.067	.067	.078	.085	.146	.210	.124	.146	210	.124	.146	.210	.124
Kips	2.53	2.91	1.66	0.03	0	-0.02	-0.03	-0.02	0.02	-0.31	-0.99	-0.26	0	-0.05	0.04	0.07	0.83	0.25
Actual Load	7.10			0.01			-0.03			-1.56			-0.01			1.15		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 57 °F Room 73 °F Instrument 76 °F	Oct.17th 1964	Initial Zero Reading 11 35 Load Reading 11 42 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2455	0 1 2

Gage Number	D 18	D 19	D 20	D 21	D 22	D 23	D 24	D 25	D 26
Test Channel	17	18	19	20	21	22	23	24	25
Position of Gage	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	003	001	001	002	001	000	000	000
Microinches: Load Reading	-041	-018	056	311	189	026	-103	-223	035
Microinches: Difference	-043	-021	055	310	187	025	-103	-223	035
Kips/in^2	-1.29	-0.63	1.65	9.30	5.61	0.75	-3.09	-6.69	1.05
Section	2x2x$\frac{1}{8}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.146	.210	.124	.094	.151	.116	.094	.151	.116
Kips	-0.19	-0.13	0.20	0.87	0.85	0.09	-0.29	-1.01	0.12
Actual Load	-0.12			1.81			-1.18		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 57 °F Room 73 °F Instrument 76 °F	Oct.17th 1964	Initial Zero Reading 11 35 Load Reading 11 55 Final Zero Reading	combined longitudinal and transverse load at ground wire suspension point Load in Pounds 2455 longit. 1100 transv.	0, 1, 2

Gage Number	C 40	C 41	C 42	C 43	C 44	C 45	C 46	C 47	C 48	D 9	D 10	D 11	D 12	D 13	D 14	D 15	D 16	D 17
Test Channel	39	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Position of Gage	2	1	0	2	1	0	0	1	2	2	1	0	2	1	0	2	1	0
Microinches: Zero Reading	001	004	003	000	001	001	004	002	002	002	002	002	001	004	003	000	002	001
Microinches: Load Reading	182	155	123	018	005	-006	-005	-001	005	-065	-158	-072	021	-008	-027	010	151	076
Microinches: Difference	181	151	120	018	004	-007	-009	-003	003	-067	-160	-074	020	-012	-024	010	149	075
Kips/in²	5.43	4.53	3.60	0.54	0.12	-0.21	-0.27	-0.09	0.09	-2.01	-1.80	-2.23	0.60	-0.36	-0.72	0.30	4.47	2.25
Section	2½x2½x¼			1x1x⅛			1x1x⅛			2x2x⅛			2x2x⅛			2x2x⅛		
Coefficients	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_2	f_1	f_o
	.381	.481	.327	.085	.078	.067	.067	.078	.085	.146	.210	.124	.146	.210	.124	.146	.210	.124
Kips	2.07	2.18	1.18	0.05	0.01	-0.01	-0.02	-0.01	0.01	-0.31	-1.01	-0.28	0.09	-0.08	-0.09	0.04	0.94	0.28
Actual Load	5.43			0.05			-0.02			-1.61			-0.08			1.26		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 57 °F Room 73 °F Instrument 76 °F	Oct.17th 1964	Initial Zero Reading 11 35 Load Reading 11 55 Final Zero Reading	Combined longitudunal and transverse load at ground wire suspension point Load in Pounds 2455 longit. 1100 transv.	0, 1, 2

Gage Number	D 18	D 19	D 20	D 21	D 22	D 23	D 24	D 25	D 26
Test Channel	17	18	19	20	21	22	23	24	25
Position of Gage	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	003	001	001	002	001	000	000	000
Microinches: Load Reading	-057	-015	088	324	189	028	-087	-222	034
Microinches: Difference	-059	-018	087	323	187	027	-087	-222	034
Kips/in²	-1.77	-0.54	2.61	9.69	5.61	0.81	-2.61	-6.66	1.02
Section	2x2x⅛			1½x1½x⅛			1½x1½x⅛		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.146	.210	.124	.094	.151	.116	.094	.151	.116
Kips	-0.26	-0.11	0.32	0.91	0.85	0.09	-0.25	-1.01	0.12
Actual Load	-0.05			1.85			-1.14		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 57 °F Room 73 °F Instrument 77 °F	Oct.17th 1964	Initial Zero Reading 11 35 Load Reading Final Zero Reading 12 11	Zero control reading Load in Pounds No load	0, 1, 2

Gage Number	C 40	C 41	C 42	C 43	C 44	C 45	C 46	C 47	C 48	D 9	D 10	D 11	D 12	D 13	D 14	D 15	D 16	D 17
Test Channel	39	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Position of Gage	2	1	0	2	1	0	0	1	2	2	1	0	2	1	0	2	1	0
Microinches: Zero Reading	001	004	003	000	001	001	004	002	002	002	002	002	001	004	003	000	002	001
Microinches: Load Reading	005	004	002	000	002	000	002	000	-001	000	000	000	000	001	002	-001	003	001
Microinches: Difference	004	000	-001	000	001	-001	-002	-002	-003	-002	-002	-002	-001	-003	-001	-001	001	000
Kips/in²	0.12	0	-0.03	0	0.03	-0.03	-0.06	-0.06	-0.09	-0.06	-0.06	-0.06	-0.03	-0.09	-0.03	-0.03	0.03	0
Section	2½x2½x¼			1x1x⅛			1x1x⅛			2x2x⅛			2x2x⅛			2x2x⅛		
Coefficients	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_2	f_1	f_o
	.381	.481	.327	.085	.078	.067	.067	.078	.085	.146	.210	.124	.146	.210	.124	.146	.210	.124
Kips	0.05	0	-0.01	0	0	0	0	0	-0.01	-0.01	-0.01	-0.01	0	-0.02	0	0	-0.01	0
Actual Load	0.04			0			-0.01			-0.03			-0.02			-0.01		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 57 °F Room 73 °F Instrument 77 °F	Oct.17th 1964	Initial Zero Reading 11 35 Load Reading Final Zero Reading 12 11	Zero control reading Load in Pounds No load	0, 1, 2

Gage Number	D 18	D 19	D 20	D 21	D 22	D 23	D 24	D 25	D 26
Test Channel	17	18	19	20	21	22	23	24	25
Position of Gage	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	003	001	001	002	001	000	000	000
Microinches: Load Reading	000	002	003	002	-001	000	005	002	000
Microinches: Difference	-002	-001	002	001	-003	000	005	002	000
Kips/in²	-0.06	-0.03	0.06	0.03	-0.09	0	0.15	0.06	0
Section	2x2x⅛			1½x1½x⅛			1½x1½x⅛		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.146	.210	.124	.094	.151	.116	.094	.151	.116
Kips	-0.01	-0.01	0.01	0	-0.01	0	0.01	0.01	0
Actual Load	-0.01			-0.01			0.02		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 49 °F, Room 71 °F, Instrument 75 °F
Date: Oct.8th 1964
Time: Initial Zero Reading 2 10; Load Reading 2 37; Final Zero Reading
Type of Test Load: Transverse load at ground wire suspension Point; Load in Pounds 1605
Position of Gage: 0, 1, 2

Gage Number	C 40	C 41	C 42	C 43	C 44	C 45	C 46	C 47	C 48	D 9	D 10	D 11	D 12	D 13	D 14	D 15	D 16	D 17
Test Channel	39	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Position of Gage	2	1	0	2	1	0	0	1	2	2	1	0	2	1	0	2	1	0
Microinches: Zero Reading	000	000	-001	000	003	000	000	-001	000	-001	001	001	000	000	000	-002	000	001
Microinches: Load Reading	017	068	066	-007	-002	-008	-010	-008	-001	-009	002	004	-026	004	041	-004	-015	-010
Microinches: Difference	017	068	067	-007	-005	-008	-010	-007	-001	-008	001	003	-026	004	041	-002	-015	-011
Kips/in² x (-1)	-0.51	-2.04	-2.01	0.21	0.15	0.24	0.30	0.21	0.03	0.24	-0.03	-0.09	0.78	-0.12	-1.23	0.06	0.45	0.33
Section	2½x2½x¼			1x1x⅛			1x1x⅛			2x2x⅛			2x2x⅛			2x2x⅛		
Coefficients	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_2	f_1	f_o
	.381	.481	.327	.085	.078	.067	.067	.078	.085	.146	.210	.124	.146	.210	.124	.146	.210	.124
Kips	-0.19	-0.99	-0.66	0.02	0.01	0.02	0.02	0.02	0	0.04	-0.01	-0.01	0.11	-0.03	-0.15	0.01	0.10	0.04
Actual Load	-1.84			0.05			0.04			0.02			-0.07			0.15		

Temperatures: Outside 49 °F, Room 71 °F, Instrument 75 °F
Date: Oct.8th 1964
Time: Initial Zero Reading 2 10; Load Reading; Final Zero Reading
Type of Test Load: Transverse load at ground wire suspension point; Load in Pounds 1605
Position of Gage: 0, 1, 2

Gage Number	D 18	D 19	D 20	D 21	D 22	D 23	D 24	D 25	D 26
Test Channel	17	18	19	20	21	22	23	24	25
Position of Gage	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	000	001	000	-001	-007	-002	001	002	-002
Microinches: Load Reading	018	-013	-045	-013	-004	002	-012	008	004
Microinches: Difference	018	-014	-045	-012	003	004	-013	006	006
Kips/in² x (-1)	-0.54	0.42	1.35	0.36	-0.09	-0.12	0.39	-0.18	-0.18
Section	2x2x⅛			1½x1½x⅛			1½x1½x⅛		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.146	.210	.124	.094	.151	.116	.094	.151	.116
Kips	-0.08	0.09	0.17	0.03	-0.01	-0.01	0.04	-0.03	-0.02
Actual Load	0.18			0.01			-0.01		

Temperatures: Outside 57 °F, Room 73 °F, Instrument 76 °F
Date: Oct.17th 1964
Time: Initial Zero Reading 11 35; Load Reading 12 09; Final Zero Reading
Type of Test Load: Transverse load at ground wire suspension point; Load in Pounds 1100
Position of Gage: 0, 1, 2

Gage Number	C 40	C 41	C 42	C 43	C 44	C 45	C 46	C 47	C 48	D 9	D 10	D 11	D 12	D 13	D 14	D 15	D 16	D 17
Test Channel	39	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Position of Gage	2	1	0	2	1	0	0	1	2	2	1	0	2	1	0	2	1	0
Microinches: Zero Reading	001	004	003	000	001	001	004	002	002	002	002	002	001	004	003	000	002	001
Microinches: Load Reading	-034	-047	-047	-004	-003	-002	005	002	-007	-003	-011	-011	014	-007	-035	-015	018	007
Microinches: Difference	-035	-051	-050	-004	-004	-003	001	000	-009	-005	-013	-013	013	-011	-038	-015	016	006
Kips/in²	-1.05	-1.53	-1.50	-0.12	-0.12	-0.09	0.03	0	-0.27	-0.15	-0.39	-0.39	0.39	-0.33	-1.14	-0.45	0.48	0.18
Section	2½x2½x¼			1x1x⅛			1x1x⅛			2x2x⅛			2x2x⅛			2x2x⅛		
Coefficients	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_2	f_1	f_o
	.381	.481	.327	.085	.078	.067	.067	.078	.085	.146	.210	.124	.146	.210	.124	.146	.210	.124
Kips	-0.40	-0.74	-0.49	-0.01	-0.01	-0.01	0	0	-0.02	-0.02	-0.08	-0.05	0.06	-0.07	-0.14	-0.07	0.10	0.02
Actual Load	-1.63			-0.03			-0.02			-0.15			-0.15			0.05		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures: Outside 57 °F, Room 73 °F, Instrument 76 °F
Date: Oct.17th 1964
Time: Initial Zero Reading 11 35; Load Reading 12 09; Final Zero Reading
Type of Test Load: Transverse load at ground wire suspension point; Load in Pounds 1100
Position of Gage: 0, 1, 2

Gage Number	D 18	D 19	D 20	D 21	D 22	D 23	D 24	D 25	D 26
Test Channel	17	18	19	20	21	22	23	24	25
Position of Gage	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	003	001	001	002	001	000	000	000
Microinches: Load Reading	-021	006	035	020	-004	004	021	005	-003
Microinches: Difference	-023	003	034	019	-006	003	021	005	-003
Kips/in²	-0.69	0.09	1.02	0.57	-0.18	0.09	0.63	0.15	-0.09
Section	2x2x⅛			1½x1½x⅛			1½x1½x⅛		
Coefficients	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.146	.210	.124	.094	.151	.116	.094	.151	.116
Kips	-0.10	0.02	0.13	0.05	-0.03	0.01	0.06	0.02	-0.01
Actual Load	0.05			0.03			0.07		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 46 °F, Room 66 °F, Instrument 72 °F
Date: Oct.5th 1964
Time: Initial Zero Reading 6 10; Load Reading 6 55; Final Zero Reading
Type of Test Load: Longitudinal load at conductor suspension point; Load in Pounds 2305
Position of Gage: 0, 1, 2

Gage Number	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	011	009	010	006	008	005	004	003	001	004	006	006	006	003	008	005	006	006
Microinches: Load Reading	043	-092	-221	449	435	-087	-488	-486	182	-063	-118	-273	381	348	-048	-416	-367	149
Microinches: Difference	032	-101	-232	443	427	-092	492	-489	180	-067	-124	-279	375	345	-056	-421	-373	143
Kips/in²	0.96	-3.03	-6.96	13.29	12.81	-2.76	-14.76	-14.67	5.40	-2.01	-3.72	-8.37	11.22	10.35	-1.68	-12.63	-11.19	4.29
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.276	.094	.151	.116	.094	.151	.116	.276	.392	.232	.094	.151	.116	.094	.151	.116
Kips	0.22	-1.19	-1.92	1.31	1.93	-0.32	-1.39	-2.22	0.63	-0.56	-1.46	-1.95	1.15	1.56	-0.20	-1.19	-1.69	0.50
Actual Load	-2.89			2.92			-2.98			-3.97			2.51			-2.38		

Temperatures: Outside 46 °F, Room 66 °F, Instrument 72 °F
Date: Oct.5th 1964
Time: Initial Zero Reading 6 10; Load Reading 6 55; Final Zero Reading
Type of Test Load: Longitudinal load at conductor suspension point; Load in Pounds 2305
Position of Gage: 0, 1, 2

Gage Number	E 19	E 20	E 21	E 22	E 23	E 24	E 25	E 26	E 27	E 28	E 29	E 30	E 31	E 32	E 33	E 34	E 35	E 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	008	005	008	007	008	002	009	010	007	006	006	009	005	011	009	010	009	009
Microinches: Load Reading	303	146	102	453	452	-079	-503	-405	171	221	107	-008	404	346	-071	-372	-379	171
Microinches: Difference	293	140	092	446	442	-083	-513	-416	162	214	100	-017	397	338	-076	-380	-386	164
Kips/in²	8.79	4.20	2.76	13.38	13.26	-2.49	-15.39	-12.48	4.86	6.42	3.00	-0.51	11.91	10.14	-2.28	-11.40	-11.58	4.92
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.277	.094	.151	.116	.094	.151	.116	.277	.392	.232	.094	.151	.116	.094	.151	.116
Kips	2.04	1.64	0.76	1.26	2.00	-0.29	-1.45	-1.89	0.56	1.77	1.17	-0.12	1.12	1.53	-0.27	-1.07	-1.75	0.58
Actual Load	4.44			2.97			-2.78			2.82			2.38			-2.24		

Temperatures: Outside 72 °F, Room 74 °F, Instrument 82 °F
Date: Oct.14th 1964
Time: Initial Zero Reading 7 15; Load Reading 7 20; Final Zero Reading
Type of Test Load: Longitudinal load at conductor suspension point; Load in Pounds 2255
Position of Gage: 0, 1, 2

Gage Number	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	006	004	005	003	003	002	003	003	002	002	001	002	002	003	000	002	002	001
Microinches: Load Reading	035	-080	-222	457	456	-100	-508	-496	191	-076	-135	-276	375	345	-058	-425	-369	135
Microinches: Difference	029	-084	-227	454	453	-102	-511	-499	189	-078	-136	-278	373	342	-058	-427	-371	134
Kips/in²	0.87	-2.52	-6.81	13.62	13.59	-3.06	-15.33	-14.97	5.67	-2.34	-4.08	-8.34	11.19	10.26	-1.74	-12.81	-11.13	4.02
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.276	.094	.151	.116	.094	.151	.116	.276	.392	.232	.094	.151	.116	.094	.151	.116
Kips	0.20	-0.99	-1.89	1.28	2.05	-0.36	-1.44	-2.26	0.66	-0.65	-1.60	-1.93	1.05	1.55	-0.20	-1.21	-1.68	0.47
Actual Load	-2.68			2.97			-3.04			-4.18			2.40			-2.42		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures: Outside 72 °F, Room 74 °F, Instrument 82 °F
Date: Oct.14th 1964
Time: Initial Zero Reading 7 15; Load Reading 7 20; Final Zero Reading
Type of Test Load: Longitudinal load at conductor suspension point; Load in Pounds 2255
Position of Gage: 0, 1, 2

Gage Number	E 19	E 20	E 21	E 22	E 23	E 24	E 25	E 26	E 27	E 28	E 29	E 30	E 31	E 32	E 33	E 34	E 35	E 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	003	002	002	-002	003	003	004	003	004	005	005	004	004	003	004	002	002	003
Microinches: Load Reading	284	158	101	466	452	-093	-536	-432	172	147	112	026	388	337	-072	-401	-393	174
Microinches: Difference	281	156	099	468	449	-096	-540	-435	168	142	107	022	384	334	-076	-403	-395	171
Kips/in²	8.43	4.68	2.97	14.04	14.47	-2.88	-16.20	-13.05	5.04	4.26	3.21	0.66	11.52	10.02	-2.28	-12.09	-11.85	5.13
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.277	.094	.151	.116	.094	.151	.116	.277	.392	.232	.094	.151	.116	.094	.151	.116
Kips	1.95	1.83	0.82	1.32	2.18	-0.33	-1.52	-1.97	0.58	1.18	1.26	0.15	1.09	1.51	-0.26	-1.14	-1.79	0.60
Actual Load	4.60			3.17			-2.91			2.59			2.34			-2.33		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 71 °F, Room 74 °F, Instrument 81 °F
Date: Oct. 14th 1964
Time: Initial Zero Reading 7 15; Load Reading 7 35; Final Zero Reading
Type of Test Load: Combined longitudinal and transverse load at conductor suspension point. Load in Pounds 2255 longit. 2350 transv.
Position of Gage: 0, 1, 2

Gage Number	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	006	004	005	003	003	002	003	003	002	002	001	002	002	003	000	002	002	001
Microinches: Load Reading	173	134	-031	440	414	-091	-449	-447	171	-236	-337	-402	366	352	-061	-440	-376	132
Microinches: Difference	167	130	-036	437	411	-093	-451	-450	169	-238	-338	-404	364	349	-061	-442	-378	131
Kips/in²	5.01	3.90	-1.08	13.11	12.33	-2.79	-13.53	-13.50	5.07	-7.14	-10,14	-12.12	10.92	10.47	-1.83	-13.26	-11.34	3.93
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.276	.094	.151	.116	.094	.151	.116	.276	.392	.232	.094	.151	.116	.094	.151	.116
Kips	1.16	1.53	-0.30	1.24	1.87	-0.32	-1.27	-2.04	0.59	-1.97	-3.98	-2.82	1.03	1.58	-0.21	-1.25	-1.71	0.46
Actual Load	2.39			2.79			-2.72			-8.77			2.40			-2.50		

Temperatures: Outside 71 °F, Room 74 °F, Instrument 81 °F
Date: Oct. 14th 1964
Time: Initial Zero Reading 7 15; Load Reading 7 35; Final Zero Reading
Type of Test Load: Combined longitudinal and transverse load at conductor suspension point. Load in Pounds 2255 longit. 2350 transv.
Position of Gage: 0, 1, 2

Gage Number	E 19	E 20	E 21	E 22	E 23	E 24	E 25	E 26	E 27	E 28	E 29	E 30	E 31	E 32	E 33	E 34	E 35	E 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	003	002	002	-002	003	003	004	003	004	005	005	004	004	003	004	002	002	003
Microinches: Load Reading	167	-004	-036	412	428	-084	-511	-381	165	245	296	128	403	336	-059	-395	-358	191
Microinches: Difference	164	-006	-038	414	425	-087	-515	-384	161	240	291	124	399	333	-063	-397	-360	188
Kips/in²	4.92	-0.18	-1.14	12.42	12.75	-2.61	-15.45	-11.52	4.83	7.20	8.72	3.72	11.97	9.99	-1.89	-11.91	-10.80	5.64
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.277	.094	.151	.116	.094	.151	.116	.277	.392	.232	.094	.151	.116	.094	.151	.116
Kips	1.14	-0.07	-0.31	1.17	1.93	-0.30	-1.45	-1.74	0.56	2.00	3.42	0.86	1.12	1.50	-0.22	-1.12	-1.63	0.65
Actual Load	0.76			2.80			-2.63			6.28			2.40			-2.10		

Temperatures: Outside 70 °F, Room 72 °F, Instrument 81 °F
Date: Oct. 14th 1964
Time: Initial Zero Reading 7 15; Load Reading; Final Zero Reading 7 55
Type of Test Load: Zero control reading. Load in Pounds No load
Position of Gage: 0, 1, 2

Gage Number	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	006	004	005	003	003	002	003	003	002	002	001	002	002	003	000	002	002	001
Microinches: Load Reading	014	017	014	021	015	011	-007	011	007	004	002	015	004	007	004	004	017	003
Microinches: Difference	008	013	009	018	012	009	-010	008	005	002	001	013	002	004	004	002	015	002
Kips/in²	0.24	0.39	0.27	0.54	0.36	0.27	-0.30	0.24	0.15	0.06	0.03	0.39	0.06	0.12	0.12	0.08	0.45	0.06
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.276	.094	.151	.116	.094	.151	.116	.276	.392	.232	.094	.151	.116	.094	.151	.116
Kips	0.06	0.15	0.07	0.05	0.05	0.03	-0.03	0.04	0.02	0.02	0.01	0.09	0.01	0.02	0.01	0.01	0.07	0.01
Actual Load	0.28			0.13			0.03			0.12			0.04			0.09		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures: Outside 70 °F, Room 72 °F, Instrument 81 °F
Date: Oct. 14th 1964
Time: Initial Zero Reading 7 15; Load Reading; Final Zero Reading 7 55
Type of Test Load: Zero control reading. Load in Pounds No load
Position of Gage: 0, 1, 2

Gage Number	E 19	E 20	E 21	E 22	E 23	E 24	E 25	E 26	E 27	E 28	E 29	E 30	E 31	E 32	E 33	E 34	E 35	E 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	003	002	002	-002	003	003	004	003	004	005	005	004	004	003	004	002	002	003
Microinches: Load Reading	010	007	015	-014	010	009	-003	014	013	002	015	017	012	001	015	017	012	012
Microinches: Difference	007	005	013	-012	007	006	-007	011	009	-003	010	013	008	-002	011	015	010	009
Kips/in²	0.21	0.15	0.39	-0.36	0.21	0.18	-0.21	0.33	0.27	-0.09	0.30	0.39	0.24	-0.06	0.33	0.45	0.30	0.27
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.277	.094	.151	.116	.094	.151	.116	.277	.392	.232	.094	.151	.116	.094	.151	.116
Kips	0.05	0.06	0.11	-0.03	0.03	0.02	-0.02	0.05	0.03	-0.02	0.12	0.09	0.02	-0.01	0.04	0.04	0.05	0.03
Actual Load	0.22			0.02			0.06			0.19			0.05			0.12		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 56 °F Room 68 °F Instrument 70.5 °F	Oct.9th 1964	Initial Zero Reading 12 25 Load Reading 1 18 Final Zero Reading	Transverse load at three conductor suspension points Load in Pounds 3022	0, 1, 2

Gage Number	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	-008	-004	000	-002	-004	000	-005	-007	-004	-005	-017	-016	-020	-023	-020	-016	-013	-018
Microinches: Load Reading	-168	-230	-206	-013	014	-006	-035	-015	-006	180	215	141	-006	-023	-022	-018	-006	-015
Microinches: Difference	-160	-226	-206	-011	018	-006	-030	-008	-002	185	232	157	014	000	-002	-002	007	003
Kips/in^2 x (-1)	4.80	6.78	6.18	0.33	-0.54	0.18	0.90	0.24	0.06	-5.55	-6.96	-4.71	-0.42	0	0.06	0.06	-0.21	-0.09
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2	f_2	f_1	f_0	f_0	f_1	f_2	f_0	f_1	f_2
	.232	.392	.276	.094	.151	.116	.094	.151	.116	.276	.392	.232	.094	.151	.116	.094	.151	.116
Kips	1.12	2.70	1.71	0.03	-0.08	0.02	0.09	0.04	0.01	-1.53	-2.73	-1.09	-0.04	0	0.01	0.01	-0.03	-0.01
Actual Load	5.53			-0.03			0.14			-5.35			-0.03			-0.03		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 56 °F Room 68 °F Instrument 70.5 °F	Oct.9th 1964	Initial Zero Reading 12 25 Load Reading 1 18 Final Zero Reading	Transverse load at three conductor suspension points Load in Pounds 3022	0, 1, 2

Gage Number	E 19	E 20	E 21	E 22	E 23	E 24	E 25	E 26	E 27	E 28	E 29	E 30	E 31	E 32	E 33	E 34	E 35	E 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	-009	-007	-010	-008	-009	-007	-005	-010	-007	-011	-006	-012	-010	-011	-014	-007	-017	-022
Microinches: Load Reading	153	191	207	010	-011	-016	-010	-041	-021	-223	-225	-163	-027	-014	-024	-022	-054	-035
Microinches: Difference	162	198	217	018	-002	-009	-005	-031	-014	-212	-219	-151	-017	-003	-010	-015	-037	-013
Kips/in^2 x (-1)	-4.86	-5.94	-6.51	-0.54	0.06	0.27	0.15	0.93	0.42	6.36	6.57	4.53	0.51	0.09	0.30	0.45	1.11	0.39
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2	f_2	f_1	f_0	f_0	f_1	f_2	f_0	f_1	f_2
	.232	.392	.277	.094	.151	.116	.094	.151	.116	.277	.392	.232	.094	.151	.116	.094	.151	.116
Kips	-1.13	-2.43	-1.80	-0.05	0.01	0.03	0.02	0.14	0.05	1.76	2,58	1.09	0.05	0.01	0.04	0.04	0.17	0.05
Actual Load	-5.36			-0.01			0.21			5.43			0.10			0.26		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 71 °F Room 74 °F Instrument 81 °F	Oct.14th 1964	Initial Zero Reading 7 15 Load Reading 7 42 Final Zero Reading	Transverse load at three conductor suspension points Load in Pounds 2350	0, 1, 2

Gage Number	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	006	004	005	003	003	002	003	003	002	002	001	002	002	003	000	002	002	001
Microinches: Load Reading	-145	206	186	025	-004	013	011	013	003	-152	-188	-106	-019	-001	-001	002	016	-001
Microinches: Difference	139	202	181	022	-007	011	008	010	001	-154	-189	-108	-021	-004	-001	000	014	-002
Kips/in^2	4.17	6.06	5.43	0.66	-0.21	0.33	0.24	0.30	0.03	-4.62	-5.67	-3.24	-0.63	-0.12	-0.03	0	0.42	-0.06
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2	f_2	f_1	f_0	f_0	f_1	f_2	f_0	f_1	f_2
	.232	.392	.276	.094	.151	.116	.094	.151	.116	.276	.392	.232	.094	.151	.116	.094	.151	.116
Kips	0.97	2.38	1.50	0.07	-0.03	0.04	0.02	0.05	000	-1.28	-2.22	-0.75	-0.06	-0.02	0	0	0.06	0
Actual Load	4.85			0.08			0.07			-4.25			-0.08			0.06		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 71 °F Room 74 °F Instrument 81 °F	Oct.14th 1964	Initial Zero Reading 7 15 Load Reading 7 42 Final Zero Reading	Transverse load at three conductor suspension points Load in Pounds 2350	0, 1, 2

Gage Number	E 19	E 20	E 21	E 22	E 23	E 24	E 25	E 26	E 27	E 28	E 29	E 30	E 31	E 32	E 33	E 34	E 35	E 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	003	002	002	-002	003	003	004	003	004	005	005	004	004	003	004	002	002	003
Microinches: Load Reading	-110	-150	-138	-023	014	010	-016	025	020	108	203	126	015	-010	030	028	043	022
Microinches: Difference	-113	-152	-140	-021	011	007	-020	022	016	103	198	122	011	-013	026	026	041	019
Kips/in^2	-3.39	-4.56	-4.20	-0.63	0.33	0.21	-0.60	0.66	0.48	3.09	5.94	3.66	0.33	-0.39	0.78	0.78	1.23	0.57
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_0	f_1	f_2	f_0	f_1	f_2	f_0	f_1	f_2	f_2	f_1	f_0	f_0	f_1	f_2	f_0	f_1	f_2
	.232	.392	.277	.094	.151	.116	.094	.151	.116	.277	.392	.232	.094	.151	.116	.094	.151	.116
Kips	-0.78	-1.79	-1.16	-0.06	0.05	0.02	-0.06	0.10	0.06	0.86	2.32	0.85	0.03	-0.06	0.09	0.07	0.19	0.07
Actual Load	-3.73			0			0.10			4.03			0.06			0.33		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 50 °F Room 71 °F Instrument 76.5 °F	Oct.6th 1964	Initial Zero Reading 7 35 Load Reading 8 05 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2505	0, 1, 2

Gage Number	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	000	000	-001	-002	-003	-002	-004	-003	003	-001	003	000	000	-001	000	-003	-002	-002
Microinches: Load Reading	007	114	248	-376	-377	081	429	427	-148	167	209	308	-258	-247	041	285	272	-089
Microinches: Difference	007	114	249	-374	-374	083	433	430	-151	168	206	308	-258	-246	041	288	274	-087
Kips/in² x (-1)	-0.21	-3.42	-7.47	11.22	11.22	-2.49	-12.99	-12.90	4.53	-5.04	-6.18	-9.24	7.74	7.38	-1.23	-8.64	-8.22	2.61
Section	2½x2½x³16			1½x1½x¹8			1½x1½x¹8			2½x2½x³16			1½x1½x¹8			1½x1½x¹8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.276	.094	.151	.116	.094	.151	.116	.276	.392	.232	.094	.151	.116	.094	.151	.116
Kips	-0.05	-1.34	-2.07	1.06	1.70	-0.29	-1.22	-1.96	0.53	-1.39	-2.42	-2.14	0.73	1.11	-0.14	-0.81	-1.24	0.30
Actual Load	-3.46			2.47			-2.65			-5.95			1.70			-1.74		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 50 °F Room 71 °F Instrument 76.5 °F	Oct.6th 1964	Initial Zero Reading 7 35 Load Reading 8 05 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2505	0, 1, 2

Gage Number	E 19	E 20	E 21	E 22	E 23	E 24	E 25	E 26	E 27	E 28	E 29	E 30	E 31	E 32	E 33	E 34	E 35	E 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	-002	-003	-002	-001	-001	-003	000	000	-003	-006	-002	-001	-001	001	003	-004	000	-002
Microinches: Load Reading	-285	-150	-153	-356	-380	059	374	331	-123	-280	-166	-071	-352	-303	070	321	349	-142
Microinches: Difference	-283	-147	-151	-357	-379	062	374	331	-120	-274	-164	-070	-351	-304	067	325	349	-140
Kips/in² x (-1)	8.49	4.41	4.53	10.65	11.37	-1.86	-11.22	-9.93	3.60	8.22	4.92	2.10	10.53	9.12	-2.01	-9.75	-10.47	4.20
Section	2½x2½x³16			1½x1½x¹8			1½x1½x¹8			2½x2½x³16			1½x1½x¹8			1½x1½x¹8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.277	.094	.151	.116	.094	.151	.116	.277	.392	.232	.094	.151	.116	.094	.151	.116
Kips	1.97	1.73	1.25	1.00	1.72	-0.22	-1.06	-1.50	0.42	2.28	1.93	0.49	0.99	1.38	-0.23	-0.92	-1.58	0.48
Actual Load	4.95			2.50			-2.14			4.70			2.14			-2.02		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 54 °F Room 71 °F Instrument 76 °F	Oct.17th 1964	Initial Zero Reading 10 42 Load Reading 10 52 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2455	0, 1, 2

Gage Number	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	-001	003	005	001	-002	-001	-002	002	000	000	000	002	004	003	003	001	-002
Microinches: Load Reading	-019	-114	-266	402	400	-104	-470	-464	163	-178	-228	-324	271	261	-045	-314	-292	081
Microinches: Difference	-021	-113	-269	397	399	-102	-469	-462	161	-178	-228	-324	269	257	-042	-317	-293	083
Kips/in²	-0.63	-3.39	-6.07	11.91	11.97	-3.06	-14.07	-13.86	4.83	-5.34	-6.87	-9.72	8.07	7.71	-1.26	-9.51	-8.79	2.49
Section	2½x2½x³16			1½x1½x¹8			1½x1½x¹8			2½x2½x³16			1½x1½x¹8			1½x1½x¹8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.276	.094	.151	.116	.094	.151	.116	.276	.392	.232	.094	.151	.116	.094	.151	.116
Kips	-0.15	-1.33	-2.24	1.12	1.81	-0.35	-1.32	-2.10	0.56	-1.48	-2.69	-2.26	0.76	1.17	-0.15	-0.89	-1.32	0.29
Actual Load	-3.72			2.58			-2.86			-6.43			1.78			-1.92		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 54 °F Room 71 °F Instrument 76 °F	Oct.17th 1964	Initial Zero Reading 10 42 Load Reading Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2455	0, 1, 2

Gage Number	E 19	E 20	E 21	E 22	E 23	E 24	E 25	E 26	E 27	E 28	E 29	E 30	E 31	E 32	E 33	E 34	E 35	E 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	-002	001	001	-003	000	001	-002	-006	-007	-009	-009	-007	-008	-010	-008	-010	-010	-005
Microinches: Load Reading	280	155	158	377	399	-083	-412	-379	118	193	200	065	352	308	-085	-370	-395	146
Microinches: Difference	282	154	157	380	399	-084	-410	-373	125	202	209	072	360	318	-077	-360	-385	151
Kips/in²	8.46	4.62	4.71	11.40	11.97	-2.52	-12.30	-11.19	3.75	6.06	6.27	2.16	10.80	9.54	-2.31	-10.80	-11.55	4.53
Section	2½x2½x³16			1½x1½x¹8			1½x1½x¹8			2½x2½x³16			1½x1½x¹8			1½x1½x¹8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.277	.094	.151	.116	.094	.151	.116	.277	.392	.232	.094	.151	.116	.094	.151	.116
Kips	1.96	1.81	1.31	1.07	1.80	-0.29	-1.16	-1.69	0.44	1.68	2.46	0.50	1.02	1.44	-0.27	-1.02	-1.75	0.53
Actual Load	5.08			2.58			-2.41			4.64			2.19			-2.24		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 54 °F, Room 71 °F, Instrument 76 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 10 42, Load Reading 11 00, Final Zero Reading | Type of Test Load: Combined longitudinal and transverse load at ground wire suspension point. Load in Pounds 2455 longit. 1100 transv. | Position of Gage: 0, 1, 2

Gage Number	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	-001	003	005	001	-002	-001	-002	002	000	001	000	002	004	003	003	001	-002
Microinches: Load Reading	058	-001	-158	397	382	-107	-454	-454	158	-269	-343	-400	258	257	-055	-330	-305	072
Microinches: Difference	056	000	-161	392	381	-105	-453	-452	156	-269	-344	-400	256	253	-058	-333	-306	074
Kips/in^2	1.68	0	-4.83	11.76	11.43	-3.15	-13.59	-13.56	4.68	-8.07	-10.32	-12.0	7.68	7.59	-1.74	-9.99	-9.18	2.22
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.276	.094	.151	.116	.094	.151	.116	.276	.392	.232	.094	.151	.116	.094	.151	.116
Kips	0.39	0	-1.34	1.11	1.73	-0.37	-1.28	-2.05	0.54	-2.24	-4.05	-2.79	0.72	1.14	-0.20	-0.93	-1.38	0.26
Actual Load	-0.95			2.47			-2.79			-9.08			1.66			-2.05		

Temperatures: Outside 54 °F, Room 71 °F, Instrument 76 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 10 42, Load Reading 11 00, Final Zero Reading | Type of Test Load: Combined longitudinal and transverse load at ground wire suspension point. Load in Pounds 2455 longit. 1100 transv. | Position of Gage: 0, 1, 2

Gage Number	E 19	E 20	E 21	E 22	E 23	E 24	E 25	E 26	E 27	E 28	E 29	E 30	E 31	E 32	E 33	E 34	E 35	E 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	-002	001	001	-003	000	001	-002	-006	-007	-009	-009	-007	-008	-010	-008	-010	-010	-005
Microinches: Load Reading	198	052	076	324	357	-077	-376	-331	100	255	292	117	349	298	-088	-373	-379	146
Microinches: Difference	200	051	075	327	357	-078	-374	-325	107	264	301	124	357	308	-080	-363	-369	151
Kips/in^2	6.00	1.53	2.25	9.81	10.71	-2.34	-11.22	-9.75	3.21	7.92	9.03	3.72	10.71	9.24	-2.40	-10.89	-11.07	4.53
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.277	.094	.151	.116	.094	.151	.116	.277	.392	.232	.094	.151	.116	.094	.151	.116
Kips	1.39	0.60	0.62	0.92	1.62	-0.27	-1.06	-1.47	0.37	2.20	3.54	0.86	1.01	1.39	-0.28	-1.03	-1.68	0.53
Actual Load	2.61			2.27			-2.16			6.60			2.12			-2.18		

Temperatures: Outside 55 °F, Room 71 °F, Instrument 76 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 10 42, Load Reading, Final Zero Reading 11 28 | Type of Test Load: Zero control reading. Load in Pounds No load | Position of Gage: 0, 1, 2

Gage Number	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	-001	003	005	001	-002	-001	-002	002	000	001	000	002	004	003	003	001	-002
Microinches: Load Reading	-012	-013	-013	-011	-017	-019	-024	-011	-014	-011	-010	-013	-015	-013	-013	-016	-013	-019
Microinches: Difference	-014	-012	-016	-016	-018	-017	-023	-009	-016	-011	-011	-013	-017	-017	-016	-019	-014	-017
Kips/in^2	-0.42	-0.36	-0.48	-0.48	-0.54	-0.51	-0.69	-0.27	-0.48	-0.33	-0.33	-0.39	-0.51	-0.51	-0.48	-0.57	-0.42	-0.51
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.276	.094	.151	.116	.094	.151	.116	.276	.392	.232	.094	.151	.116	.094	.151	.116
Kips	-0.11	-0.14	-0.13	-0.05	-0.08	-0.06	-0.06	-0.04	-0.06	-0.09	-0.13	-0.09	-0.05	-0.08	-0.06	-0.05	-0.06	-0.06
Actual Load	-0.38			-0.19			-0.16			-0.31			-0.19			-0.17		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures: Outside 55 °F, Room 71 °F, Instrument 76 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 10 42, Load Reading, Final Zero Reading 11 28 | Type of Test Load: Zero control reading. Load in Pounds No load | Position of Gage: 0, 1, 2

Gage Number	E 19	E 20	E 21	E 22	E 23	E 24	E 25	E 26	E 27	E 28	E 29	E 30	E 31	E 32	E 33	E 34	E 35	E 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	-002	001	001	-003	000	001	-002	-006	-007	-009	-009	-007	-008	-010	-008	-010	-010	-005
Microinches: Load Reading	-020	-014	-010	-023	-014	-015	-015	-028	-024	-031	-026	-023	-028	-031	-028	-027	-028	-023
Microinches: Difference	-018	-015	-011	-020	-014	-016	-013	-022	-017	-022	-017	-016	-020	-021	-020	-017	-018	-018
Kips/in^2	-0.54	-0.45	-0.33	-0.60	-0.42	-0.48	-0.39	-0.66	-0.51	-0.66	-0.51	-0.48	-0.60	-0.63	-0.60	-0.51	-0.54	-0.54
Section	2½x2½x3/16			1½x1½x1/8			1½x1½x1/8			2½x2½x3/16			1½x1½x1/8			1½x1½x1/8		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.277	.094	.151	.116	.094	.151	.116	.277	.392	.232	.094	.151	.116	.094	.151	.116
Kips	-0.13	-0.18	-0.09	-0.06	-0.06	-0.06	-0.04	-0.10	-0.06	-0.18	-0.20	-0.11	-0.06	-0.10	-0.07	-0.05	-0.08	-0.06
Actual Load	-0.40			-0.18			-0.20			-0.49			-0.23			-0.19		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 48 °F Room 68 °F Instrument 72 °F	Oct.8th 1964	Initial Zero Reading 5 40 Load Reading 6.00 Final Zero Reading	Transverse load at ground wire suspension points Load in Pounds 1605	0, 1, 2

Gage Number	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	001	001	000	000	-001	000	000	000	000	-004	001	-001	001	001	001	-002	000
Microinches: Load Reading	112	149	137	018	006	-007	000	-020	-003	-122	-150	-105	-018	-003	-009	-011	-019	-008
Microinches: Difference	110	148	136	018	006	-006	000	-020	-003	-122	-146	-106	-017	-004	-010	-012	-017	-008
Kips/in^2	3.30	4.44	4.08	0.54	0.18	-0.18	0	-0.60	-0.09	-3.66	-4.38	-3.18	-0.51	-0.12	-0.30	-0.36	-0.51	-0.24
Section	$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.276	.094	.151	.116	.094	.151	.116	.276	.392	.232	.094	.151	.116	.094	.151	.116
Kips	0.77	1.74	1.13	0.05	0.03	-0.02	0	-0.09	-0.01	-1.01	-1.74	-0.74	-0.05	-0.02	-0.03	-0.03	-0.08	-0.03
Actual Load	3.64			0.06			-0.10			-3.49			-0.10			-0.14		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 48 °F Room 68 °F Instrument 72 °F	Oct.8th 1964	Initial Zero Reading 5 40 Load Reading 6 00 Final Zero Reading	Transverse load at ground wire suspension point Load in Pounds 1605	0, 1, 2

Gage Number	E 19	E 20	E 21	E 22	E 23	E 24	E 25	E 26	E 27	E 28	E 29	E 30	E 31	E 32	E 33	E 34	E 35	E 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	002	001	002	002	000	001	000	000	002	003	001	003	001	001	000	.000	002
Microinches: Load Reading	-109	-128	-127	-048	-039	008	033	046	-005	136	135	103	012	000	008	010	020	012
Microinches: Difference	-111	-130	-128	-050	-041	008	032	046	-005	134	132	102	009	-001	007	010	020	010
Kips/in^2	-3.33	-3.90	-3.84	-1.50	-1.23	0.24	0.96	1.38	-0.15	4.02	3.96	3.06	0.27	-0.03	0.21	0.30	0.60	0.30
Section	$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.277	.094	.151	.116	.094	.151	.116	.277	.392	.232	.094	.151	.116	.094	.151	.116
Kips	-0.77	-1.53	-1.06	-0.14	-0.19	0.03	0.09	0.21	-0.02	1.11	1.55	0.71	0.03	0	0.02	0.03	0.09	0.03
Actual Load	-3.36			-0.30			0.28			3.37			0.05			0.15		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 55 °F Room 71 °F Instrument 76 °F	Oct.17th 1964	Initial Zero Reading 10 42 Load Reading 11 10 Final Zero Reading	Transverse load at ground wire suspension point Load in Pounds 1100	0, 1, 2

Gage Number	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	002	-001	003	005	001	-002	-001	-002	002	000	001	000	002	004	003	003	001	-002
Microinches: Load Reading	074	108	096	003	-016	-013	-011	-010	-004	-100	-118	-084	-015	-004	-013	-018	-012	-016
Microinches: Difference	072	109	093	-002	-017	-011	-010	-008	-006	-100	-119	-084	-017	-008	-016	-021	-013	-014
Kips/in^2	2.16	3.27	2.79	-0.06	-0.51	-0.33	-0.30	-0.24	-0.18	-3.00	-3.57	-2.52	-0.51	-0.24	-0.48	-0.63	-0.39	-0.42
Section	$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.276	.094	.151	.116	.094	.151	.116	.276	.392	.232	.094	.151	.116	.094	.151	.116
Kips	0.50	1.28	0.78	-0.01	-0.08	-0.04	-0.03	-0.04	-0.02	-0.83	-1.40	-0.59	-0.05	-0.04	-0.06	-0.06	-0.06	-0.05
Actual Load	2.56			-0.13			-0.09			-2.82			-0.15			-0.17		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 55 °F Room 71 °F Instrument 76 °F	Oct.17th 1964	Initial Zero Reading 10 42 Load Reading 11 10 Final Zero Reading	Transverse load at ground wire suspension point Load in Pounds 1100	0, 1, 2

Gage Number	E 19	E 20	E 21	E 22	E 23	E 24	E 25	E 26	E 27	E 28	E 29	E 30	E 31	E 32	E 33	E 34	E 35	E 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	0	1	2	0	1	2	2	1	0	0	1	2	0	1	2
Microinches: Zero Reading	-002	001	001	-003	000	001	-002	-006	-007	-009	-009	-007	-008	-010	-008	-010	-010	-005
Microinches: Load Reading	-083	-098	-081	-051	-036	002	022	018	-019	025	083	050	-012	-021	-011	-020	-007	-001
Microinches: Difference	-081	-099	-082	-048	-036	001	024	024	-012	034	092	057	-004	-011	-003	-010	003	-004
Kips/in^2	-2.43	-2.97	-2.46	-1.44	-1.08	0.03	0.72	0.72	-0.36	1.02	2.76	1.71	-0.12	-0.33	-0.09	-0.30	0.09	-0.12
Section	$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$			$1\frac{1}{2}x1\frac{1}{2}x\frac{1}{8}$		
Coefficients	f_o	f_1	f_2	f_o	f_1	f_2	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_o	f_1	f_2
	.232	.392	.277	.094	.151	.116	.094	.151	.116	.277	.392	.232	.094	.151	.116	.094	.151	.116
Kips	-0.56	-1.16	-0.68	-0.14	-0.16	0	0.07	0.11	-0.04	0.28	1.08	0.40	-0.01	-0.05	-0.01	-0.03	0.01	-0.01
Actual Load	-2.39			-0.30			0.14			1.76			-0.07			-0.03		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 44 °F, Room 67 °F, Instrument 74 °F | **Date:** Oct.5th 1964 | **Time:** Initial Zero Reading 7 55, Load Reading 8 15, Final Zero Reading | **Type of Test Load:** Longitudinal load at conductor suspension point, Load in Pounds 2305 | **Position of Gage:** 0, 1, 2

Gage Number	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10	F 11	F 12	F 13	F 14	F 15	F 16	F 17	F 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	-002	-001	-002	-001	000	-002	-002	000	-002	-003	-002	-004	000	-001	000	-003	000
Microinches: Load Reading	252	166	-024	116	032	227	-319	-251	-077	-021	148	276	255	071	214	-181	-167	-085
Microinches: Difference	252	168	-023	118	033	227	-317	-249	-077	-019	151	278	259	071	215	-181	-164	-085
Kips/in^{2}x (-1)	-7.56	-5.04	0.69	-3.54	-0.99	-6.81	9.51	7.47	2.31	0.57	-4.53	-8.34	-7.77	-2.13	-5.45	-5.43	4.92	2.55
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	-1.75	-1.92	0.19	-0.30	-0.08	-0.46	0.64	0.58	0.20	0.16	-1.78	-1.93	-0.66	-0.17	-0.43	0.36	0.38	0.22
Actual Load	-3.48			-0.84			1.42			-3.55			-1.26			0.96		

Temperatures: Outside 44 °F, Room 67 °F, Instrument 74 °F | **Date:** Oct.5th 1964 | **Time:** Initial Zero Reading 7 55, Load Reading 8 15, Final Zero Reading | **Type of Test Load:** Longitudinal load at conductor suspension point, Load in Pounds 2305 | **Position of Gage:** 0, 1, 2

Gage Number	F 19	F 20	F 21	F 22	F 23	F 24	F 25	F 26	F 27	F 28	F 29	F 30	F 31	F 32	F 33	F 34	F 35	F 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	000	001	002	002	000	000	001	000	002	000	-003	001	000	002	000	000	001
Microinches: Load Reading	-251	-035	-211	081	223	135	-237	-213	-131	-254	-122	020	095	187	140	-038	-200	-057
Microinches: Difference	-251	-035	-212	079	221	135	-237	-214	-131	-256	-122	023	094	187	138	-138	-200	-058
Kips/in^{2}x (-1)	7.53	1.05	6.36	-2.37	-6.63	-4.05	7.11	6.42	3.93	7.68	3.66	-0.69	-2.82	-5.61	-4.14	4.14	6.00	1.74
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	1.75	0.41	1.76	-0.20	-0.52	-0.27	0.48	0.50	0.33	2.13	1.47	-0.16	-0.24	-0.44	-0.28	0.28	0.47	0.15
Actual Load	3.92			-0.99			1.31			3.44			-0.96			0.90		

Temperatures: Outside 70 °F, Room 75 °F, Instrument 81 °F | **Date:** Oct.14th 1964 | **Time:** Initial Zero Reading 8 10, Load Reading 8 31, Final Zero Reading | **Type of Test Load:** Longitudinal load at conductor suspension point, Load in Pounds 2255 | **Position of Gage:** 0, 1, 2

Gage Number	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10	F 11	F 12	F 13	F 14	F 15	F 16	F 17	F 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
Microinches: Load Reading	-259	-119	-081	-079	-083	-196	302	235	049	-145	-084	-173	-283	-050	-227	186	130	071
Microinches: Difference	-259	-119	-081	-079	-083	-196	302	235	049	-145	-084	-173	-283	-050	-227	186	130	071
Kips/in^2	-7.77	-3.57	-2.43	-2.40	-2.49	-5.88	9.06	7.05	1.47	-4.35	-2.52	-5.19	-8.49	-1.50	-6.81	5.58	3.90	2.13
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	-1.80	-1.40	-0.67	-0.20	-0.19	-0.39	0.61	0.55	0.13	-1.20	-0.99	-1.20	-0.72	-0.12	-0.46	0.38	0.30	0.18
Actual Load	-3.87			-0.78			1.29			-3.39			-1.30			0.86		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures: Outside 70 °F, Room 75 °F, Instrument 81 °F | **Date:** Oct.14th 1964 | **Time:** Initial Zero Reading 8 10, Load Reading 8 31, Final Zero Reading | **Type of Test Load:** Longitudinal load at conductor suspension point, Load in Pounds 2255 | **Position of Gage:** 0, 1, 2

Gage Number	F 19	F 20	F 21	F 22	F 23	F 24	F 25	F 26	F 27	F 28	F 29	F 30	F 31	F 32	F 33	F 34	F 35	F 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
Microinches: Load Reading	300	004	268	-020	-278	-158	273	129	203	262	117	011	-041	-261	-129	137	163	087
Microinches: Difference	300	004	268	-020	-278	-158	273	129	203	262	117	011	-041	-261	-129	137	163	087
Kips/in^2	9.00	0.09	8.04	-0.60	-8.34	-4.74	8.19	3.87	6.09	7.86	3.51	0.33	-1.23	-7.83	-3.87	4.11	4.89	2.61
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	2.09	0.03	2.23	-0.05	-0.65	-0.32	0.55	0.30	0.52	2.18	1.38	0.08	-0.10	-0.61	-0.26	0.28	0.38	0.22
Actual Load	4.35			-1.02			1.37			3.64			-0.97			0.88		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 70 °F, Room 75 °F, Instrument 81 °F | Date: Oct.14th 1964 | Time: Initial Zero Reading 8 10, Load Reading 8 45, Final Zero Reading | Type of Test Load: Combined longitudinal and transverse load at conductor suspension point. Load in Pounds 2255 longit. 2350 transv. | Position of Gage: 0, 1, 2

Gage Number	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10	F 11	F 12	F 13	F 14	F 15	F 16	F 17	F 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
Microinches: Load Reading	213	-105	148	096	-055	-083	382	320	106	-342	-299	-338	-492	062	-332	127	087	-062
Microinches: Difference	213	-105	148	096	-055	-083	382	320	106	-342	-299	-338	-492	062	-332	127	087	-062
Kips/in^2	6.39	-3.15	4.44	2.88	-1.65	-2.49	11.46	9.60	3.18	-10.26	-8.97	-10.14	-14.76	1.86	-9.96	3.81	2.61	-1.86
Section	$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1x1x\frac{1}{8}$			$1x1x\frac{1}{8}$			$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1x1x\frac{1}{8}$			$1x1x\frac{1}{8}$		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	1.48	-1.23	1.23	0.25	-0.13	-0.17	0.77	0.75	0.27	-2.84	-3.52	-2.36	-1.26	0.15	-0.67	0.26	0.20	-0.16
Actual Load	1.48			-0.05			1.79			-8.72			-1.78			0.30		

Temperatures: Outside 70 °F, Room 75 °F, Instrument 81 °F | Date: Oct.14th 1964 | Time: Initial Zero Reading 8 10, Load Reading 8 45, Final Zero Reading | Type of Test Load: Combined longitudinal and transverse load at conductor suspension point. Load in Pounds 2255 longit. 2350 transv. | Position of Gage: 0, 1, 2

Gage Number	F 19	F 20	F 21	F 22	F 23	F 24	F 25	F 26	F 27	F 28	F 29	F 30	F 31	F 32	F 33	F 34	F 35	F 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
Microinches: Load Reading	020	088	-030	127	-370	-248	374	209	074	491	105	291	066	-368	-165	239	221	-075
Microinches: Difference	020	088	-030	127	-370	-248	374	209	074	491	105	291	066	-368	-165	239	221	-075
Kips/in^2	0.60	2.64	-0.90	3.81	-11.1	-7.74	11.22	6.27	2.22	14.73	3.15	8.73	1.98	-11.04	-4.95	7.17	6.63	-2.25
Section	$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1x1x\frac{1}{8}$			$1x1x\frac{1}{8}$			$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1x1x\frac{1}{8}$			$1x1x\frac{1}{8}$		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	0.14	1.05	-0.25	0.32	-0.87	-0.50	0.75	0.49	0.19	4.09	1.24	2.02	0.17	-0.86	-0.33	0.48	0.52	-0.19
Actual Load	0.94			-1.05			1.43			7.35			-1.02			0.81		

Temperatures: Outside 68 °F, Room 75 °F, Instrument 80 °F | Date: Oct.14th 1964 | Time: Initial Zero Reading 8 10, Load Reading, Final Zero Reading 9 05 | Type of Test Load: Zero control reading. Load in Pounds No load | Position of Gage: 0, 1, 2

Gage Number	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10	F 11	F 12	F 13	F 14	F 15	F 16	F 17	F 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
Microinches: Load Reading	012	023	004	007	013	006	011	007	007	005	008	013	010	011	013	013	020	008
Microinches: Difference	012	023	004	007	013	006	011	007	007	005	008	013	010	011	013	013	020	008
Kips/in^2	0.36	0.69	0.12	0.21	0.39	0.18	0.33	0.21	0.21	0.15	0.24	0.39	0.30	0.33	0.39	0.39	0.60	0.24
Section	$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1x1x\frac{1}{8}$			$1x1x\frac{1}{8}$			$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1x1x\frac{1}{8}$			$1x1x\frac{1}{8}$		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	0.08	0.27	0.03	0.02	0.03	0.01	0.02	0.02	0.02	0.04	0.09	0.09	0.03	0.03	0.02	0.02	0.05	0.02
Actual Load	0.38			0.06			0.06			0.22			0.08			0.09		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures: Outside 68 °F, Room 75 °F, Instrument 80 °F | Date: Oct.14th 1964 | Time: Initial Zero Reading 8 10, Load Reading, Final Zero Reading 9 05 | Type of Test Load: Zero control reading. Load in Pounds No load | Position of Gage: 0, 1, 2

Gage Number	F 19	F 20	F 21	F 22	F 23	F 24	F 25	F 26	F 27	F 28	F 29	F 30	F 31	F 32	F 33	F 34	F 35	F 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
Microinches: Load Reading	003	011	003	006	002	009	016	006	033	024	028	000	004	016	021	-004	002	019
Microinches: Difference	003	011	003	006	002	009	016	006	033	024	028	000	004	016	021	-004	002	019
Kips/in^2	0.09	0.33	0.09	0.18	0.06	0.27	0.48	0.18	0.99	0.72	0.84	0	0.12	0.48	0.63	-0.12	0.06	0.57
Section	$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1x1x\frac{1}{8}$			$1x1x\frac{1}{8}$			$2\frac{1}{2}x2\frac{1}{2}x\frac{3}{16}$			$1x1x\frac{1}{8}$			$1x1x\frac{1}{8}$		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	0.02	0.13	0.02	0.02	0	0.02	0.03	0.01	0.08	0.20	0.33	0	0.01	0.04	0.04	-0.01	0	0.05
Actual Load	0.17			0.04			0.12			0.53			0.09			0.04		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 52 °F Room 70 °F Instrument 73 °F	Oct.10th 1964	Initial Zero Reading 10 35 Load Reading 10 59 Final Zero Reading	Transverse load at three conductor suspension points Load in Pounds 3022	0, 1, 2

Gage Number	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10	F 11	F 12	F 13	F 14	F 15	F 16	F 17	F 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	002	003	000	001	001	002	002	002	004	004	005	003	005	003	004	003	001	004
Microinches: Load Reading	-535	182	-519	063	-009	-065	021	039	021	024	268	319	054	025	040	081	045	-043
Microinches: Difference	-537	179	-519	062	-010	-067	019	037	017	020	263	316	049	022	036	078	044	-047
Kips/in^2 x (-1)	16.11	+5.37	15.57	-1.86	0.30	2.01	+0.57	+1.11	-0.51	-0.60	-7.89	+9.48	+1.47	+0.66	-1.08	-2.34	-1.32	1.41
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	3.73	+2.11	4.30	-0.16	0.02	0.13	+0.04	+0.09	-0.04	-0.17	+3.09	+2.20	+0.13	+0.05	-0.07	-0.16	+0.10	0.12
Actual Load	5.92			-0.01			-0.17			-5.46			-0.25			-0.14		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 52 °F Room 70 °F Instrument 73 °F	Oct.10th 1964	Initial Zero Reading 10 35 Load Reading 10 59 Final Zero Reading	Transverse load at three conductor suspensionpoints Load in Pounds 3022	0, 1, 2

Gage Number	F 19	F 20	F 21	F 22	F 23	F 24	F 25	F 26	F 27	F 28	F 29	F 30	F 31	F 32	F 33	F 34	F 35	F 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	004	004	004	002	001	001	001	002	002	002	002	002	003	002	001	002	003	003
Microinches: Load Reading	272	-075	605	-028	014	044	-079	-056	-053	-311	-175	-127	021	019	034	-116	-042	110
Microinches: Difference	268	-079	601	-030	013	043	-080	-058	-055	-313	-177	-129	018	017	033	-118	-045	107
Kips/in^2 x (-1)	+8.04	2.37	+18.03	0.90	-0.39	-1.29	2.40	1.74	1.65	9.39	5.31	3.87	+0.54	+0.51	+0.99	3.54	1.35	-3.21
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	+1.86	0.93	-4.98	0.08	-0.03	+0.09	0.16	0.14	0.14	2.59	2.08	0.90	+0.05	+0.04	+0.07	0.24	0.11	+0.27
Actual Load	-5.91			-0.04			0.44			5.57			-0.16			0.08		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 68 °F Room 75 °F Instrument 80 °F	Oct.14th 1964	Initial Zero Reading 8 10 Load Reading 8 50 Final Zero Reading	Transverse load at conductor suspension point Load in Pounds 2350	0, 1, 2

Gage Number	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10	F 11	F 12	F 13	F 14	F 15	F 16	F 17	F 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
Microinches: Load Reading	477	-171	464	-003	024	049	-001	-027	-005	-034	-198	-195	-109	-013	-063	-127	-021	-158
Microinches: Difference	477	-171	464	-003	024	049	-001	-027	-005	-034	-198	-195	-109	-103	-063	-127	-021	-158
Kips/in^2	14.31	+5.13	13.92	-0.09	0.72	1.47	+0.03	+0.81	-0.15	-1.02	-5.94	+5.85	+3.27	+0.39	-1.89	-3.81	-0.63	-4.74
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	3.32	+2.01	3.86	-0.01	0.06	0.10	0	-0.06	-0.01	-0.28	+2.33	+1.36	+0.28	+0.03	-0.13	-0.26	+0.05	+0.40
Actual Load	5.17			0.15			-0.07			-3.97			-0.44			-0.71		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 68 °F Room 75 °F Instrument 80 °F	Oct.14th 1964	Initial Zero Reading 8 10 Load Reading 8 50 Final Zero Reading	Transverse load at three conductor suspension points Load in Pounds 2350	0, 1, 2

Gage Number	F 19	F 20	F 21	F 22	F 23	F 24	F 25	F 26	F 27	F 28	F 29	F 30	F 31	F 32	F 33	F 34	F 35	F 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
Microinches: Load Reading	-540	087	+157	146	000	-011	101	024	077	253	155	085	+029	+018	+013	088	021	-099
Microinches: Difference	-540	087	+157	146	000	-011	101	024	077	253	155	085	+029	+018	+013	088	021	-099
Kips/in^2 -	16.2	2.61	+4.71	4.38	0	+0.33	3.03	0.75	2.31	7.59	4.65	2.55	+0.87	+0.54	+0.39	2.64	0.63	+2.97
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	+3.76	1.02	+1.31	0.37	0	+0.02	0.20	0.06	0.20	2.10	1.82	0.59	+0.07	+0.04	-0.03	0.18	0.05	+0.25
Actual Load	-4.05			0.35			0.46			4.51			-0.14			-0.02		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:		Date	Time:		Type of Test Load	Position of Gage
Outside	50 °F	Oct.6th 1964	Initial Zero Reading	6 56	Longitudinal load at ground wire suspension point	0, 1, 2
Room	73 °F		Load Reading	7 10	Load in Pounds 2505	
Instrument	77 °F		Final Zero Reading			

Gage Number	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10	F 11	F 12	F 13	F 14	F 15	F 16	F 17	F 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	012	014	019	015	015	015	016	016	014	016	014	014	016	014	014	015	015	013
Microinches: Load Reading	-266	-174	-015	-091	-016	-192	285	220	072	003	-215	-338	-198	-042	-144	147	134	072
Microinches: Difference	-278	-188	-034	-106	-031	-207	269	204	058	-013	-229	-352	-214	-056	-158	132	119	059
Kips/in^2	-8.34	-5.64	-1.02	-3.18	-0.93	-6.21	8.04	6.12	1.74	-0.39	-6.87	-10.56	-6.42	-1.68	-4.74	3.96	3.57	1.77
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	-1.93	-2.21	-0.28	-0.27	-0.07	-0.42	0.54	0.48	0.15	-0.11	-2.70	-2.45	-0.55	-0.13	-0.32	0.26	0.28	0.15
Actual Load	-4.42			-0.78			1.17			-5.26			-1.00			0.69		

Temperatures:		Date	Time:		Type of Test Load	Position of Gage
Outside	50 °F	Oct.6th 1964	Initial Zero Reading	6 56	Longitudinal load at ground wire suspension point	0, 1, 2
Room	73 °F		Load Reading	7 10	Load in Pounds 2505	
Instrument	77 °F		Final Zero Reading			

Gage Number	F 19	F 20	F 21	F 22	F 23	F 24	F 25	F 26	F 27	F 28	F 29	F 30	F 31	F 32	F 33	F 34	F 35	F 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	011	012	009	009	007	008	010	010	008	011	010	011	012	011	012	009	010	010
Microinches: Load Reading	291	072	267	-087	-185	-137	197	176	038	315	184	083	018	-125	-077	190	254	086
Microinches: Difference	280	060	258	-096	-192	-145	187	166	030	304	174	072	006	-136	-089	181	244	076
Kips/in^2	8.40	1.80	7.74	-2.88	5.76	-4.35	5.61	4.98	0.90	9.12	5.22	2.16	0.18	-4.08	-2.67	5.43	7.32	2.28
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.035	.078	.067	.067	.078	.085
Kips	2.03	0.71	2.14	-0.25	0.45	-0.29	0.38	0.39	0.08	2.53	2.05	0.50	0.02	-0.32	-0.18	0.36	0.57	0.19
Actual Load	4.88			-0.99			0.85			5.08			-0.48			1.12		

Temperatures:		Date	Time:		Type of Test Load	Position of Gage
Outside	47 °F	Oct.17th 1964	Initial Zero Reading	8 44	Longitudinal load at ground wire suspension point	0, 1, 2
Room	70 °F		Load Reading	9 06	Load in Pounds 2455	
Instrument	73 °F		Final Zero Reading			

Gage Number	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10	F 11	F 12	F 13	F 14	F 15	F 16	F 17	F 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	001	-001	-001	-001	000	-001	000	000	001	001	001	-002	000	-001	000	001	001
Microinches: Load Reading	-293	-152	-091	-085	-081	-200	249	183	035	-210	-163	-226	-236	-060	-183	128	082	032
Microinches: Difference	-293	-153	-090	-084	-080	-200	250	183	035	-211	-164	-227	-234	-060	-182	128	081	031
Kips/in^2	-8.79	-4.59	-2.70	-2.52	-2.40	-6.00	7.50	5.49	1.05	-6.33	-4.92	-6.81	-7.02	-1.80	-5.46	3.84	2.43	0.93
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.035	.078	.067	.067	.078	.085
Kips	-2.04	-1.80	-0.75	-0.21	-0.19	-0.40	0.50	0.42	0.09	-1.75	-1.93	-1.58	-0.60	-0.14	-0.37	0.26	0.19	0.08
Actual Load	-4.59			-0.80			1.01			-5.26			-1.11			0.53		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures:		Date	Time:		Type of Test Load	Position of Gage
Outside	47 °F	Oct.17th 1964	Initial Zero Reading	8 44	Longitudinal load at ground wire suspension point	0, 1, 2
Room	70 °F		Load Reading	9 06	Load in Pounds 2455	
Instrument	73 °F		Final Zero Reading			

Gage Number	F 19	F 20	F 21	F 22	F 23	F 24	F 25	F 26	F 27	F 28	F 29	F 30	F 31	F 32	F 33	F 34	F 35	F 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	000	000	002	-001	001	001	003	000	-001	000	000	-001	000	-001	000	001	000
Microinches: Load Reading	333	003	328	-034	-222	-152	233	112	097	335	118	117	-026	-211	-109	147	174	094
Microinches: Difference	333	003	328	-036	-221	-153	232	115	097	336	118	117	-025	-211	-108	147	173	094
Kips/in^2	9.99	0.09	9.84	-1.08	-6.63	-4.59	6.96	3.45	2.91	10.08	3.54	3.51	-0.75	-6.33	-3.24	4.41	5.19	2.82
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.035	.078	.067	.067	.078	.085
Kips	2.31	0.04	2.72	-0.09	-0.52	-0.31	0.46	0.27	0.25	2.79	1.39	0.81	-0.06	-0.49	-0.22	0.30	0.40	0.24
Actual Load	5.07			-0.92			0.98			4.99			-0.77			0.94		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 47 °F Room 70 °F Instrument 73 °F	Oct.17th 1964	Initial Zero Reading 8 44 Load Reading 9 24 Final Zero Reading	Combined longitudinal and transverse load at ground wire suspension point Load in Pounds 2455 longit. 1100 transv.	0, 1, 2

Gage Number	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10	F 11	F 12	F 13	F 14	F 15	F 16	F 17	F 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	001	-001	-001	-001	000	-001	000	000	001	001	001	-002	000	-001	000	001	001
Microinches: Load Reading	-047	-087	-063	-103	-089	-205	246	177	023	-298	-278	-326	-275	-065	-207	084	046	008
Microinches: Difference	-047	-088	-062	-102	-088	-205	247	177	023	-299	-279	-327	-273	-065	-206	084	045	007
Kips/in^2	-1.41	-2.64	-1.86	-3.06	-2.64	-6.15	7.41	5.31	0.69	-8.97	-8.37	-9.81	-8.19	-1.95	-6.18	2.52	1.35	0.21
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	-0.33	-1.03	-0.52	-0.26	-0.21	-0.41	0.50	0.41	0.06	-2.48	-3.28	-2.28	-0.70	-0.15	-0.41	0.17	0.11	0.02
Actual Load	-1.88			-0.88			0.97			-8.04			-1.26			0.30		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 47 °F Room 70 °F Instrument 73 °F	Oct.17th 1964	Initial Zero Reading 8 44 Load Reading 9 24 Final Zero Reading	Combined longitudinal and transverse load at ground wire suspension point Load in Pounds 2455 longit. 1100 transv.	0, 1, 2

Gage Number	F 19	F 20	F 21	F 22	F 23	F 24	F 25	F 26	F 27	F 28	F 29	F 30	F 31	F 32	F 33	F 34	F 35	F 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	000	000	002	-001	001	001	-003	000	-001	000	000	-001	000	-001	000	001	000
Microinches: Load Reading	222	-035	192	-044	-229	-176	226	093	037	454	057	251	-061	-239	-114	137	152	063
Microinches: Difference	222	-035	192	-046	-228	-177	225	096	037	456	057	251	-060	-239	-111	137	151	063
Kips/in^2	6.66	-1.05	5.76	-1.38	-6.84	-5.31	6.75	2.88	1.11	13.68	1.71	7.53	-1.80	-7.17	-3.33	4.11	4.53	1.89
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	1.55	-0.41	1.60	-0.12	-0.53	-0.36	0.45	0.22	0.09	3.82	0.66	1.75	-0.15	-0.56	-0.22	0.28	0.35	0.16
Actual Load	2.74			-1.01			0.76			6.23			-0.93			0.79		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 49 °F Room 70 °F Instrument 73.5 °F	Oct.17th 1964	Initial Zero Reading 8 44 Load Reading Final Zero Reading 9 43	Zero control reading Load in Pounds No load	0, 1, 2

Gage Number	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10	F 11	F 12	F 13	F 14	F 15	F 16	F 17	F 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	001	-001	-001	-001	000	-001	000	000	001	001	001	-002	000	-001	000	001	001
Microinches: Load Reading	-014	-015	-023	-019	-026	-025	-020	-024	-015	-012	-013	-012	-016	-015	-013	-034	-033	-013
Microinches: Difference	-014	-016	-022	-018	-025	-025	-019	-024	-015	-013	-014	-013	-014	-015	-012	-034	-034	-014
Kips/in^2	-0.42	-0.48	-0.66	-0.54	-0.75	-0.75	-0.57	-0.72	-0.45	-0.39	-0.42	-0.39	-0.42	-0.45	-0.36	-1.02	-1.02	-0.42
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	-0.10	-0.19	-0.18	-0.05	-0.06	-0.05	-0.04	-0.06	-0.04	-0.11	-0.16	-0.09	-0.04	-0.04	-0.02	-0.07	-0.08	-0.04
Actual Load	-0.47			-0.16			-0.16			-0.36			-0.10			-0.19		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 49 °F Room 70 °F Instrument 73.5 °F	Oct.17th 1964	Initial Zero Reading 8 44 Load Reading Final Zero Reading 9 43	Zero control reading Load in Pounds No load	0, 1, 2

Gage Number	F 19	F 20	F 21	F 22	F 23	F 24	F 25	F 26	F 27	F 28	F 29	F 30	F 31	F 32	F 33	F 34	F 35	F 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches: Zero Reading	000	000	000	002	-001	001	001	-003	000	-001	000	000	-001	000	-001	000	001	000
Microinches: Load Reading	001	-017	-021	-015	-008	-034	-018	-030	-044	-032	-023	-038	-034	-038	-035	-033	-033	-030
Microinches: Difference	001	-017	-021	-017	-007	-035	-019	-027	-044	-033	-023	-038	-033	-038	-034	-033	-034	-030
Kips/in^2	0.03	-0.51	-0.63	-0.51	-0.21	-1.05	-0.57	-0.81	-1.32	-0.99	-0.69	-1.14	-0.99	-1.14	-1.02	-0.99	-1.02	-0.90
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	0	-0.20	-0.17	-0.04	-0.02	-0.07	-0.04	-0.06	-0.11	-0.28	-0.26	-0.27	-0.09	-0.09	-0.07	-0.07	-0.08	-0.08
Actual Load	-0.37			-0.13			-0.21			-0.81			-0.25			-0.23		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 47 °F, Room 68 °F, Instrument 72 °F | Date: Oct.8th 1964 | Time: Initial Zero Reading 6 15, Load Reading 6 35, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1605 | Position of Gage: 0, 1, 2

Gage Number	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10	F 11	F 12	F 13	F 14	F 15	F 16	F 17	F 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches – Zero Reading	005	004	007	002	003	001	001	-002	000	-001	001	000	000	000	000	001	001	000
Microinches – Load Reading	-316	092	-301	043	005	-026	006	015	009	026	156	189	013	005	009	052	025	-045
Microinches – Difference	-321	088	-308	041	002	-027	005	017	009	027	155	189	013	005	009	051	024	-045
Kips/in² x (-1)	9.63	-2.64	9.24	-1.23	-0.06	0.81	-0.15	-0.51	-0.27	-0.81	-4.65	-5.67	-0.39	-0.15	-0.27	-1.53	-0.72	1.35
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	2.23	-1.03	2.55	-0.11	0	0.06	-0.01	-0.04	-0.02	-0.23	-1.82	-1.31	-0.03	-0.01	-0.02	-0.10	-0.06	0.11
Actual Load	3.75			-0.05			-0.07			-3.36			-0.06			-0.05		

Temperatures: Outside 47 °F, Room 68 °F, Instrument 72 °F | Date: Oct.8th 1964 | Time: Initial Zero Reading 6 15, Load Reading 6 35, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1605 | Position of Gage: 0, 1, 2

Gage Number	F 19	F 20	F 21	F 22	F 23	F 24	F 25	F 26	F 27	F 28	F 29	F 30	F 31	F 32	F 33	F 34	F 35	F 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches – Zero Reading	001	000	001	-001	000	000	000	000	000	000	000	000	001	002	-002	-001	-001	001
Microinches – Load Reading	199	-087	369	-034	-010	019	-027	-013	-023	147	-111	-069	014	020	022	-067	-027	068
Microinches – Difference	198	-087	368	-033	-010	019	-027	-013	-023	147	-111	-069	013	018	024	-066	-026	067
Kips/in² x (-1)	-5.94	2.61	-11.04	0.99	0.30	-0.57	0.81	0.39	0.69	4.47	3.33	2.07	-0.39	-0.54	-0.72	1.98	0.78	-2.01
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	-1.38	1.02	-3.05	0.09	0.02	-0.04	0.05	0.03	0.06	1.23	1.30	0.48	-0.03	-0.04	-0.05	0.13	0.06	-0.17
Actual Load	-3.41			0.07			0.14			3.01			-0.12			0.02		

Temperatures: Outside 47 °F, Room 70 °F, Instrument 73 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 8 44, Load Reading 9 34, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10	F 11	F 12	F 13	F 14	F 15	F 16	F 17	F 18
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches – Zero Reading	000	001	-001	-001	-001	000	-001	000	000	001	001	001	-002	000	-001	000	001	001
Microinches – Load Reading	282	-123	267	-020	-015	003	-018	-034	-022	-039	-136	-142	-010	-001	000	-090	-051	042
Microinches – Difference	282	-124	268	-019	-014	003	-017	-034	-022	-040	-137	-143	-008	-001	001	-090	-052	041
Kips/in²	-8.46	3.72	8.04	-0.57	-0.42	0.09	-0.51	-1.02	-0.66	-1.20	-4.11	-4.29	-0.24	-0.03	0.03	-2.70	-1.56	1.23
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	-1.97	1.46	2.22	-0.05	-0.03	0.01	-0.03	-0.08	-0.06	-0.33	-1.61	-1.00	-0.02	0	0	-0.18	-0.12	0.10
Actual Load	2.73			-0.07			-0.17			-2.94			-0.02			-0.20		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

Temperatures: Outside 47 °F, Room 70 °F, Instrument 73 °F | Date: Oct.17th 1964 | Time: Initial Zero Reading 8 44, Load Reading 9 34, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number	F 19	F 20	F 21	F 22	F 23	F 24	F 25	F 26	F 27	F 28	F 29	F 30	F 31	F 32	F 33	F 34	F 35	F 36
Test Channel	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	2	1	0	0	1	2
Microinches – Zero Reading	000	000	000	002	-001	001	001	-003	000	-001	000	000	-001	000	-001	000	001	000
Microinches – Load Reading	-258	146	-265	030	001	-059	-004	-027	-037	057	047	017	-044	-066	-055	029	-014	-096
Microinches – Difference	-258	146	-265	028	002	-060	-005	-024	-037	058	047	017	-043	-066	-054	029	-015	-096
Kips/in²	-7.74	4.38	-7.95	0.84	0.06	-1.80	-0.15	-0.72	-1.11	1.74	1.41	0.51	-1.29	-1.98	-1.62	0.87	-0.45	-2.88
Section	2½x2½x3/16			1x1x1/8			1x1x1/8			2½x2½x3/16			1x1x1/8			1x1x1/8		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_2	f_1	f_o	f_o	f_1	f_2
	.232	.392	.277	.085	.078	.067	.067	.078	.085	.277	.392	.232	.085	.078	.067	.067	.078	.085
Kips	-1.79	1.72	-2.20	0.07	0.01	-0.12	-0.01	-0.06	-0.09	0.48	0.55	0.12	-0.11	-0.15	-0.11	0.06	-0.04	-0.24
Actual Load	-2.27			-0.04			-0.16			1.15			-0.37			-0.22		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 43 °F Room 70 °F Instrument 74 °F	Oct.19th 1964	Initial Zero Reading 7 28 Load Reading 7 32 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2455	0, 1, 2

Gage Number	F 1	F 2	F 3	F 10	F 11	F 12	F 19	F 20	F 21	F 28	F 29	F 30	E 1	E 2	E 3	E 10	E 11	E 12
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0
Microinches: Zero Reading	001	002	002	000	001	002	001	001	001	002	002	002	002	000	000	002	001	000
Microinches: Load Reading	-312	-153	-098	-225	-159	-218	324	-003	322	359	101	156	-014	-114	-271	-178	-233	-331
Microinches: Difference	-313	-155	-100	-225	-160	-220	323	-004	321	357	099	154	-016	-114	-271	-180	-234	-331
Kips/in²	-9.39	-4.65	-3.00	-6.75	-4.80	-6.60	9.69	-0.12	9.63	10.71	2.97	4.62	-0.48	-3.42	-8.13	-5.40	-7.02	-9.93
Section	2½x2½x3/16			2½x2½x3/16			2½x2½x3/16			2½x2½x3/16			2½x2½x3/16			2½x2½x3/16		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o
	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232
Kips	-2.18	-1.82	-0.83	-1.86	-1.88	-1.53	2.25	-0.05	2.66	2.96	1.16	1.07	-0.11	-1.34	-2.24	-1.49	-2.75	-2.30
Actual Load	-4.83			-5.27			4.86			5.19			-3.69			-6.54		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 43 °F Room 70 °F Instrument 74 °F	Oct.19th 1964	Initial Zero Reading 7 28 Load Reading Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2455	0, 1, 2

Gage Number	E 19	E 20	E 21	E 28	E 29	E 30
Test Channel	18	19	20	21	22	23
Position of Gage	0	1	2	2	1	0
Microinches: Zero Reading	001	001	002	002	002	003
Microinches: Load Reading	293	161	162	207	213	071
Microinches: Difference	292	160	160	205	211	068
Kips/in²	8.76	4.80	4.80	6.15	6.33	2.04
Section	2½x2½x3/16			2½x2½x3/16		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o
	.232	.392	.276	.276	.392	.232
Kips	2.03	1.88	1.33	1.70	2.48	0.47
Actual Load	5.24			4.65		

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 43 °F Room 69 °F Instrument 73 °F	Oct.19th 1964	Initial Zero Reading 7 50 Load Reading 8 05 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2455	0, 1, 2

Gage Number	F 1	F 2	F 3	F 10	F 11	F 12	F 19	F 20	F 21	F 28	F 29	F 30	E 1	E 2	E 3	E 10	E 11	E 12
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0
Microinches: Zero Reading	001	000	001	001	001	002	001	000	002	001	000	002	002	000	000	000	002	003
Microinches: Load Reading	-331	-190	-059	-242	-176	-210	310	006	331	362	093	169	-017	-114	-275	-191	-234	-335
Microinches: Difference	-332	-190	-060	-243	-177	-212	309	006	329	361	093	167	-019	-114	-275	-191	-236	-338
Kips/in²	-9.96	-5.70	-1.80	-7.29	-5.31	-6.36	9.27	0.18	9.87	10.83	2.79	5.01	-0.57	-3.42	-8.15	-5.73	-7.08	-10.14
Section	2½x2½x3/16			2½x2½x3/16			2½x2½x3/16			2½x2½x3/16			2½x2½x3/16			2½x2½x3/16		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o
	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232
Kips	-2.31	-2.24	-0.50	-2.01	-2.08	-1.47	2.15	0.07	2.73	2.99	1.09	1.16	-0.13	-1.34	-2.24	-1.58	-2.77	-2.36
Actual Load	-5.05			-5.56			4.95			5.24			-3.71			-6.71		

Multiply (Kips/in) by -1 when initial Zero was read with test load on.

Temperatures:	Date	Time:	Type of Test Load	Position of Gage
Outside 43 °F Room 69 °F Instrument 73 °F	Oct.19th 1964	Initial Zero Reading 7 50 Load Reading 8 05 Final Zero Reading	Longitudinal load at ground wire suspension point Load in Pounds 2455	0, 1, 2

Gage Number	E 19	E 20	E 21	E 28	E 29	E 30
Test Channel	18	19	20	21	22	23
Position of Gage	0	1	2	2	1	0
Microinches: Zero Reading	004	002	002	001	001	002
Microinches: Load Reading	302	162	169	201	218	058
Microinches: Difference	298	160	167	200	217	056
Kips/in²	8.94	4.80	5.01	6.00	6.51	1.68
Section	2½x2½x3/16			2½x2½x3/16		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o
	.232	.392	.276	.276	.392	.232
Kips	2.08	1.88	1.38	1.66	2.55	0.39
Actual Load	5.34			4.60		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 43 °F, Room 70 °F, Instrument 74 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 7 28, Load Reading 7 39, Final Zero Reading | Type of Test Load: Combined longitudinal and transverse load at ground wire suspension point. Load in Pounds 2455 longit. 1100 transv. | Position of Gage: 0, 1, 2

Gage Number	F 1	F 2	F 3	F 10	F 11	F 12	F 19	F 20	F 21	F 28	F 29	F 30	E 1	E 2	E 3	E 10	E 11	E 12
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0
Microinches: Zero Reading	001	002	002	000	001	002	001	001	001	002	002	002	002	000	000	002	001	000
Microinches: Load Reading	-038	-086	-045	-322	-277	-319	216	-030	194	506	066	316	066	001	-159	-274	-351	-410
Microinches: Difference	-039	-087	-047	-322	-276	-321	215	-031	193	504	064	314	064	001	-159	-276	-352	-410
Kips/in^2	-1.17	-2.61	-1.41	-9.66	-8.34	-9.63	6.45	-0.93	5.79	15.12	1.92	9.42	1.92	0.03	-4.77	-8.28	-10.56	-12.30
Section	$2\frac{1}{2}x2\frac{1}{2}x^3$16			$2\frac{1}{2}x2\frac{1}{2}x^3$16			$2\frac{1}{2}x2\frac{1}{2}x^3$16			$2\frac{1}{2}x2\frac{1}{2}x^3$16			$2\frac{1}{2}x2\frac{1}{2}x^3$16			$2\frac{1}{2}x2\frac{1}{2}x^3$16		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o
	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232
Kips	-0.27	-1.02	-0.39	-2.67	-3.27	-2.23	1.50	-0.37	1.60	4.17	0.75	2.19	0.45	0.01	-1.32	-2.30	-4.15	-2.86
Actual Load	-1.68			-8.17			2.73			7.11			-0.86			-9.31		

Temperatures: Outside 43 °F, Room 70 °F, Instrument 74 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 7 28, Load Reading 7 39, Final Zero Reading | Type of Test Load: Combined longitudinal and transverse load at ground wire suspension point. Load in Pounds 2455 longit. 1100 transv. | Position of Gage: 0, 1, 2

Gage Number	E 19	E 20	E 21	E 28	E 29	E 30
Test Channel	18	19	20	21	22	23
Position of Gage	0	1	2	2	1	0
Microinches: Zero Reading	001	001	002	002	002	003
Microinches: Load Reading	214	057	076	278	311	133
Microinches: Difference	213	056	074	276	309	130
Kips/in^2	6.39	1.68	2.22	8.28	9.27	3.90
Section	$2\frac{1}{2}x2\frac{1}{2}x^3$16			$2\frac{1}{2}x2\frac{1}{2}x^3$16		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o
	.232	.392	.276	.276	.392	.232
Kips	1.48	0.66	0.62	2.29	3.62	0.91
Actual Load	2.76			6.82		

Temperatures: Outside 43 °F, Room 69 °F, Instrument 73 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 7 50, Load Reading 7 58, Final Zero Reading | Type of Test Load: Combined longitudinal and transverse load at ground wire suspension point. Load in Pounds 2455 longit. 1100 transv. | Position of Gage: 0, 1, 2

Gage Number	F 1	F 2	F 3	F 10	F 11	F 12	F 19	F 20	F 21	F 28	F 29	F 30	E 1	E 2	E 3	E 10	E 11	E 12
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0
Microinches: Zero Reading	001	000	001	001	001	002	001	000	002	001	000	002	002	000	000	000	002	003
Microinches: Load Reading	-065	-114	-009	-336	-286	-320	208	-019	203	511	066	342	063	-003	-160	-276	-354	-414
Microinches: Difference	-066	-114	-010	-337	-287	-322	207	-019	201	510	066	340	061	-003	-160	-276	-356	-417
Kips/in^2	-1.98	-3.42	-0.30	-10.11	-8.61	-9.66	6.21	-0.57	6.03	15.30	1.96	10.20	1.83	-0.09	-4.80	-8.28	-10.68	-12.51
Section	$2\frac{1}{2}x2\frac{1}{2}x^3$16			$2\frac{1}{2}x2\frac{1}{2}x^3$16			$2\frac{1}{2}x2\frac{1}{2}x^3$16			$2\frac{1}{2}x2\frac{1}{2}x^3$16			$2\frac{1}{2}x2\frac{1}{2}x^3$16			$2\frac{1}{2}x2\frac{1}{2}x^3$16		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o
	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232
Kips	-0.46	-1.35	-0.08	-2.79	-3.37	-2.24	1.44	-0.22	1.66	4.23	0.76	2.37	0.43	-0.04	-1.33	-2.28	-4.19	-2.90
Actual Load	-1.89			-8.40			2.88			7.38			-0.94			-9.37		

Multiply (Kips/in) by -1 when initial Zero was read with test load on.

Temperatures: Outside 43 °F, Room 69 °F, Instrument 73 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 7 50, Load Reading 7 58, Final Zero Reading | Type of Test Load: Combined longitudinal and transverse load at ground wire suspension point. Load in Pounds 2455 longit. 1100 transv. | Position of Gage: 0, 1, 2

Gage Number	E 19	E 20	E 21	E 28	E 29	E 30
Test Channel	18	19	20	21	22	23
Position of Gage	0	1	2	2	1	0
Microinches: Zero Reading	004	002	002	001	001	002
Microinches: Load Reading	228	064	075	288	320	134
Microinches: Difference	224	062	073	287	319	132
Kips/in^2	6.72	1.86	2.19	8.61	9.57	3.96
Section	$2\frac{1}{2}x2\frac{1}{2}x^3$16			$2\frac{1}{2}x2\frac{1}{2}x^3$16		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o
	.232	.392	.276	.276	.392	.232
Kips	1.56	0.73	0.60	2.38	3.75	0.92
Actual Load	2.89			7.05		

Multiply (Kips/in^2) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 43 °F, Room 70 °F, Instrument 74 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 7 28, Load Reading 7 42, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number	F 1	F 2	F 3	F 10	F 11	F 12	F 19	F 20	F 21	F 28	F 29	F 30	E 1	E 2	E 3	E 10	E 11	E 12
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0
Microinches: Zero Reading	001	002	002	000	001	002	001	001	001	002	002	002	002	000	000	002	001	000
Microinches: Load Reading	289	-116	288	-058	-118	-138	-274	139	-237	093	072	054	087	118	105	-098	-117	-081
Microinches: Difference	288	-118	286	-058	-119	-140	-275	138	-238	091	070	052	085	118	105	-100	-118	-081
Kips/in²	8.64	-3.54	8.58	-1.74	-3.57	-4.20	-8.25	4.14	-7.14	2.73	2.10	1.56	2.55	3.54	3.15	-3.00	-3.54	-2.43
Section	2½x2½x3/16			2½x2½x3/16			2½x2½x3/16			2½x2½x3/16			2½x2½x3/16			2½x2½x3/16		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o
	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232
Kips	2.00	-1.39	2.37	-0.48	-1.40	-0.97	-1.91	1.62	-1.97	0.75	0.82	0.36	0.59	1.39	0.87	0.83	-1.39	-0.57
Actual Load	2.98			-2.85			-2.26			1.93			2.85			-2.79		

Temperatures: Outside 43 °F, Room 70 °F, Instrument 74 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 7 28, Load Reading 7 42, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number	E 19	E 20	E 21	E 28	E 29	E 30
Test Channel	18	19	20	21	22	23
Position of Gage	0	1	2	2	1	0
Microinches: Zero Reading	001	001	002	002	002	003
Microinches: Load Reading	-075	-094	-078	049	103	069
Microinches: Difference	-076	-095	-080	047	101	066
Kips/in²	-2.28	-2.85	-2.40	1.41	3.03	1.98
Section	2½x2½x3/16			2½x2½x3/16		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o
	.232	.392	.276	.276	.392	.232
Kips	-0.53	-1.12	-0.66	0.39	1.19	0.46
Actual Load	-2.31			2.04		

Temperatures: Outside 43 °F, Room 69 °F, Instrument 73 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 7 50, Load Reading 7 54, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number	F 1	F 2	F 3	F 10	F 11	F 12	F 19	F 20	F 21	F 28	F 29	F 30	E 1	E 2	E 3	E 10	E 11	E 12
Test Channel	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage	0	1	2	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0
Microinches: Zero Reading	001	001	001	001	001	002	001	000	002	001	000	002	002	000	000	000	002	003
Microinches: Load Reading	291	-125	292	-056	-118	-133	-276	144	-248	088	074	071	085	114	106	-089	-114	-073
Microinches: Difference	290	-125	291	-057	-119	-135	-277	144	-250	087	074	069	083	114	106	-089	-116	-076
Kips/in²	8.70	-3.75	8.73	-1.71	-3.57	-4.05	-8.31	4.32	-7.50	2.61	2.22	2.07	2.49	3.42	3.18	-2.67	-3.48	-2.28
Section	2½x2½x3/16			2½x2½x3/16			2½x2½x3/16			2½x2½x3/16			2½x2½x3/16			2½x2½x3/16		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o
	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232
Kips	2.02	-1.47	2.41	-0.47	-1.40	-0.94	-1.92	1.69	-2.07	0.72	0.87	0.48	0.58	1.34	0.88	-0.74	-1.36	-0.53
Actual Load	2.97			-2.81			-2.30			2.07			2.80			-2.63		

Multiply (Kips/in) by -1 when initial Zero was read with test load on.

Temperatures: Outside 43 °F, Room 69 °F, Instrument 73 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 7 50, Load Reading 7 54, Final Zero Reading | Type of Test Load: transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number	E 19	E 20	E 21	E 28	E 29	E 30
Test Channel	18	19	20	21	22	23
Position of Gage	0	1	2	2	1	0
Microinches: Zero Reading	004	002	002	001	001	002
Microinches: Load Reading	-072	-092	-086	081	101	071
Microinches: Difference	-076	-094	-088	080	100	069
Kips/in²	-2.28	-2.82	-2.64	2.40	3.00	2.07
Section	2½x2½x3/16			2½x2½x3/16		
Coefficients	f_o	f_1	f_2	f_2	f_1	f_o
	.232	.392	.276	.276	.392	.232
Kips	-0.53	-1.11	-0.73	0.66	1.17	0.48
Actual Load	-2.37			2.31		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

Temperatures: Outside 43 °F, Room 69 °F, Instrument 73 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 8 11, Load Reading 8 16, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number		F 1	F 2	F 3	F 10	F 11	F 12	F 19	F 20	F 21	F 28	F 29	F 30	E 1	E 2	E 3	E 10	E 11	E 12
Test Channel		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage		0	1	2	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0
Microinches	Zero Reading	-017	007	004	-010	015	-009	018	-006	015	-023	-017	048	002	000	-007	-006	000	001
	Load Reading	280	-134	292	-061	-118	-138	-279	138	-232	060	053	118	082	110	100	-092	-116	-076
	Difference	297	-141	288	-051	-133	-129	-297	144	-247	083	070	070	080	110	093	-086	-116	-077
Kips/in²		8.91	-4.23	8.64	-1.53	-3.99	-3.87	-8.91	4.32	-7.41	2.49	2.10	2.10	2.40	3.30	2.79	-2.58	-3.48	-2.31
Section		2½x2½x³16			2½x2½x³16			2½x2½x³16			2½x2½x³16			2½x2½x³16			2½x2½x³16		
Coefficients		f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o
		.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232
Kips		2.07	-1.66	2.38	-0.42	-1.57	-0.90	-2.07	1.69	-2.05	0.69	0.82	0.49	0.56	1.29	0.77	-0.71	-1.36	-0.54
Actual Load		2.79			-2.89			-2.43			2.00			2.62			-2.61		

Temperatures: Outside 43 °F, Room 69 °F, Instrument 73 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 8 11, Load Reading 8 16, Final Zero Reading | Type of Test Load: Transverse load at ground wire suspension point, Load in Pounds 1100 | Position of Gage: 0, 1, 2

Gage Number		E 19	E 20	E 21	E 28	E 29	E 30
Test Channel		18	19	20	21	22	23
Position of Gage		0	1	2	2	1	0
Microinches	Zero Reading	-003	-001	007	-005	-002	002
	Load Reading	-077	-095	-086	072	095	068
	Difference	-074	-094	-093	077	097	066
Kips/in²		-2.22	-2.82	-2.79	2.31	2.91	1.98
Section		2½x2½x³16			2½x2½x³16		
Coefficients		f_o	f_1	f_2	f_2	f_1	f_o
		.232	.392	.276	.276	.392	.232
Kips		-0.52	-1.11	-0.77	0.63	1.14	0.46
Actual Load		-2.40			2.23		

Temperatures: Outside 43 °F, Room 69 °F, Instrument 73 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 7 50, Load Reading, Final Zero Reading 8 18 | Type of Test Load: Zero control reading, Load in Pounds No load | Position of Gage: 0, 1, 2

Gage Number		F 1	F 2	F 3	F 10	F 11	F 12	F 19	F 20	F 21	F 28	F 29	F 30	E 1	E 2	E 3	E 10	E 11	E 12
Test Channel		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Position of Gage		0	1	2	2	1	0	0	1	2	2	1	0	0	1	2	2	1	0
Microinches	Zero Reading	001	000	001	001	001	002	001	000	002	001	000	002	002	000	000	000	002	003
	Load Reading	-002	-017	003	001	-005	-001	-002	007	-005	-030	-021	044	-003	-005	-006	-007	-006	-004
	Difference	-003	-017	002	000	-006	-003	-003	007	-007	-031	-021	046	-005	-005	-006	-007	-008	-007
Kips/in²		-0.09	-0.51	0.06	0	-0.18	-0.09	-0.09	0.21	-0.21	-0.93	-0.63	1.38	-0.15	-0.15	-0.18	-0.21	-0.24	-0.21
Section		2½x2½x³16			2½x2½x³16			2½x2½x³16			2½x2½x³16			2½x2½x³16			2½x2½x³16		
Coefficients		f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o	f_o	f_1	f_2	f_2	f_1	f_o
		.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232	.232	.392	.276	.276	.392	.232
Kips		-0.02	-0.20	0.02	0	-0.07	-0.02	-0.02	0.08	-0.06	-0.26	-0.25	0.32	-0.03	-0.06	-0.05	-0.06	-0.09	-0.05
Actual Load		-0.20			-0.09			0			-0.19			-0.14			-0.20		

Multiply (Kips/in) by -1 when initial Zero was read with test load on.

Temperatures: Outside 43 °F, Room 69 °F, Instrument 73 °F | Date: Oct.19th 1964 | Time: Initial Zero Reading 7 50, Load Reading, Final Zero Reading 8 18 | Type of Test Load: Zero control reading, Load in Pounds No load | Position of Gage: 0, 1, 2

Gage Number		E 19	E 20	E 21	E 28	E 29	E 30
Test Channel		18	19	20	21	22	23
Position of Gage		0	1	2	2	1	0
Microinches	Zero Reading	004	002	002	001	001	002
	Load Reading	-002	-001	-002	-010	-006	-003
	Difference	-006	-003	-004	-011	-007	-005
Kips/in²		-0.18	-0.09	-0.12	-0.33	-0.21	-0.15
Section		2½x2½x³16			2½x2½x³16		
Coefficients		f_o	f_1	f_2	f_2	f_1	f_o
		.232	.392	.276	.276	.392	.232
Kips		-0.04	-0.04	-0.03	-0.09	-0.08	-0.03
Actual Load		-0.11			-0.20		

Multiply (Kips/in²) by -1 when initial Zero was read with test load on.

STRAIN READINGS & MEMBER LOADS

APPENDIX C

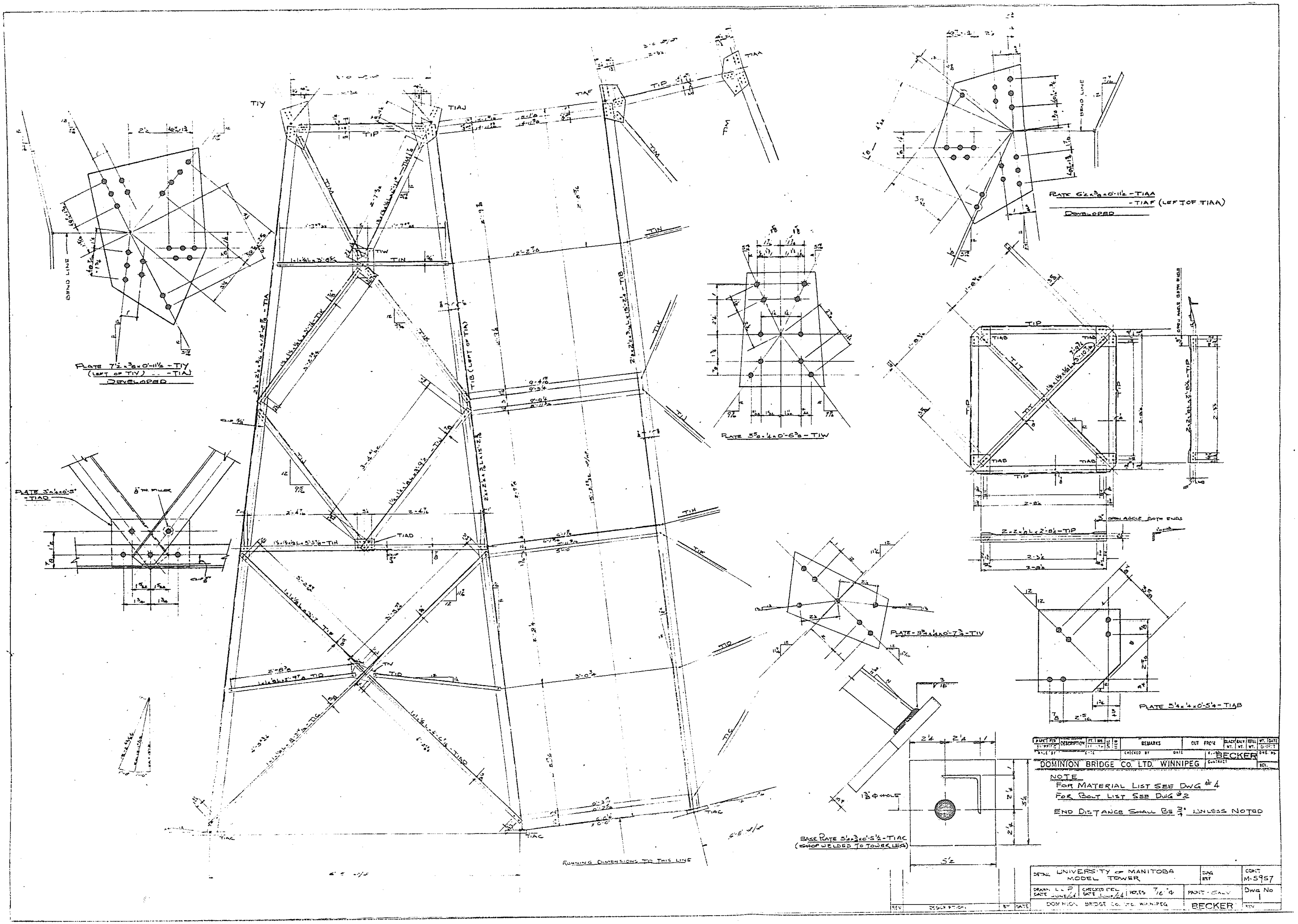
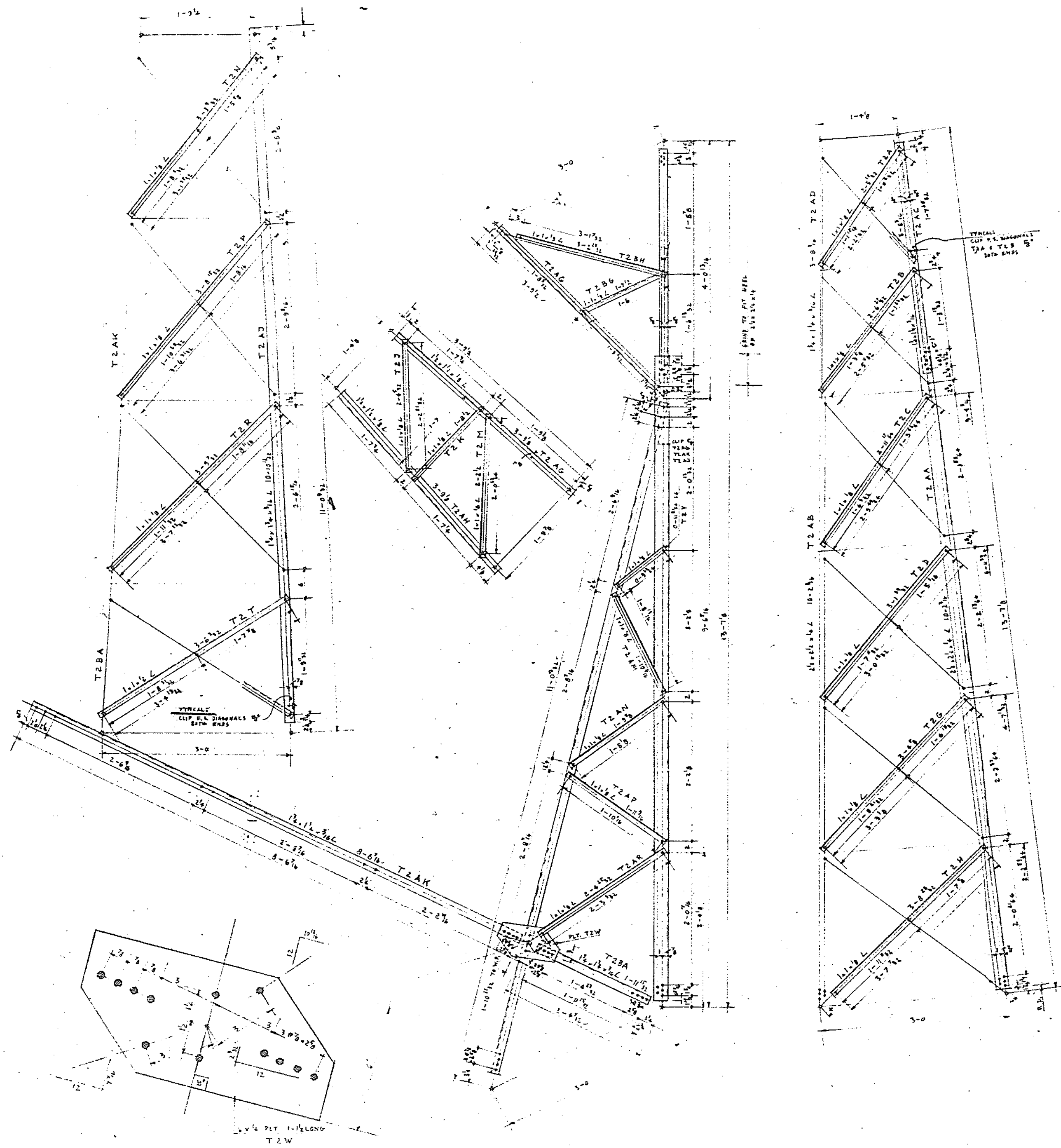


PLATE 7½ x ⅜ x 0'-11½ - T1Y
(LEFT OF T1Y) - T1AJ
DEVELOPED
PLATE 5⅝ x ¼ x 0'-6⅞ - T1W
PLATE 6½ x ⅜ x 0'-11½ - T1AA
- T1AF (LEFT OF T1AA)
DEVELOPED
PLATE - 5⅝ x ¼ x 0'-7⅞ - T1V
PLATE 5¼ x ¼ x 0'-5¼ - T1AB
BASE PLATE 5½ x ⅜ x 0'-5½ - T1AC
(SHOP WELDED TO TOWER LEG)
RUNNING DIMENSIONS TO THIS LINE
DOMINION BRIDGE CO. LTD. WINNIPEG
NOTE
FOR MATERIAL LIST SEE DWG #4
FOR BOLT LIST SEE DWG #2
END DISTANCE SHALL BE ¾" UNLESS NOTED
DETAIL UNIVERSITY OF MANITOBA MODEL TOWER
CONT. M-5957
DWG No 1
PAINT - GALV
BECKER
DOMINION BRIDGE CO. LTD. WINNIPEG



Mark	Pcs.	Description	Ft.	Ins.			Remarks	Cut from	Black Wt.	Galv. Wt.	Total Wt.
SK 2	300	5/8" Ø BOLT		3/4"			1/4" SHANK LENGTH C.W. HEX NUT, 1/8 THICK LOCK W.	FOR DWG 5957 1,2,3	76	-	76
	500	DO.		7/8"			1/8" SHANK LENGTH HEX NUT, 1/8 THICK LOCK W.				
	200	DO		1"			1/2 SHANK LENGTH HEX NUT, 1/8 THICK LOCK W.				
T2BH	2	1×1×1/8	3	2 23/32				(X1)	5	-	5
T2BG	2	1×1×1/8	1	7 1/2					3	-	3
T2BA	2	1 3/4×1 3/4×3/16	1	11 15/32					8	-	8
T2AK	2	1 3/4×1 3/4×3/16	8	6 7/16				1/26-0	36	1	37
T2AJ	2	1 3/4×1 3/4×3/16	10	10 15/32					46	2	48
T2AH	2	1 1/2×1 1/2×3/16	3	5 5/8				1/37-11	9	-	9
T2AG	2	1 1/2×1 1/2×3/16	3	5 5/8					9	-	9
T2AD	2	1 3/4×1 3/4×3/16	3	8 3/16			LEFT OF T2AC	1/16-0	16	1	17
T2AC	2	1 3/4×1 3/4×3/16	3	8 3/16					16	1	17
T2AB	2	2 1/2×2 1/2×1/4	10	2 7/16			LEFT OF T2AA	2/15-0	83	3	86
T2AA	2	2 1/2×2 1/2×1/4	10	2 7/16				2/15-0	83	3	86
T2AR	4	1×1×1/8	2	4 27/32					8	-	8
T2AP	4	1×1×1/8	1	11 3/16					6	-	6
T2AN	4	1×1×1/8	1	9 5/8				(X1)	6	-	6
T2AM	4	1×1×1/8	1	10 5/16					6	-	6
T2Y	4	1×1×1/8	0	11 1/2					3	-	3
T2W	2	6×1/4 PLT	1	1 1/2					12	-	12
T2T	4	1×1×1/8	3	6 3/32					11	-	11
T2R	4	1×1×1/8	3	9 7/32					12	-	12
T2P	4	1×1×1/8	3	8 15/32					12	-	12
T2N	4	1×1×1/8	3	3 7/32					10	-	10
T2M	2	1×1×1/8	2	2 1/2					4	-	4
T2K	2	1×1×1/8	1	8 1/2				5/40-0 (X1)	3	-	3
T2J	2	1×1×1/8	2	4 3/32					4	-	4
T2H	4	1×1×1/8	3	8					12	-	12
T2G	4	1×1×1/8	3	4 7/8					11	-	11
T2D	4	1×1×1/8	3	1					10	-	10
T2C	4	1×1×1/8	2	11					9	-	9
T2B	4	1×1×1/8	2	5					8	-	8
T2A	4	1×1×1/8	2	3				344	7	11	7 355

MARK SHIPPING | PCS. | DESCRIPTION | FT. INS. LENGTH | REMARKS | CUT FROM | BLACK WT. | GALV. WT. | TOTAL WT.

MADE BY D.E.N. DATE JUNE 64 CHECKED BY DATE BECKER DWG. No.

DOMINION BRIDGE Co. LTD. WINNIPEG CONTRACT REV.

END DISTANCE 3/4" UNLESS NOTED

ALL MATERIAL A 36

5/8" Ø BOLTS - ASTM A394 TOWER BOLTS OR EQUAL

ALL HOLES PUNCHED ON ℄ OF ANGLES UNLESS NOTED.

REV	DESCRIPTION	BY	DATE

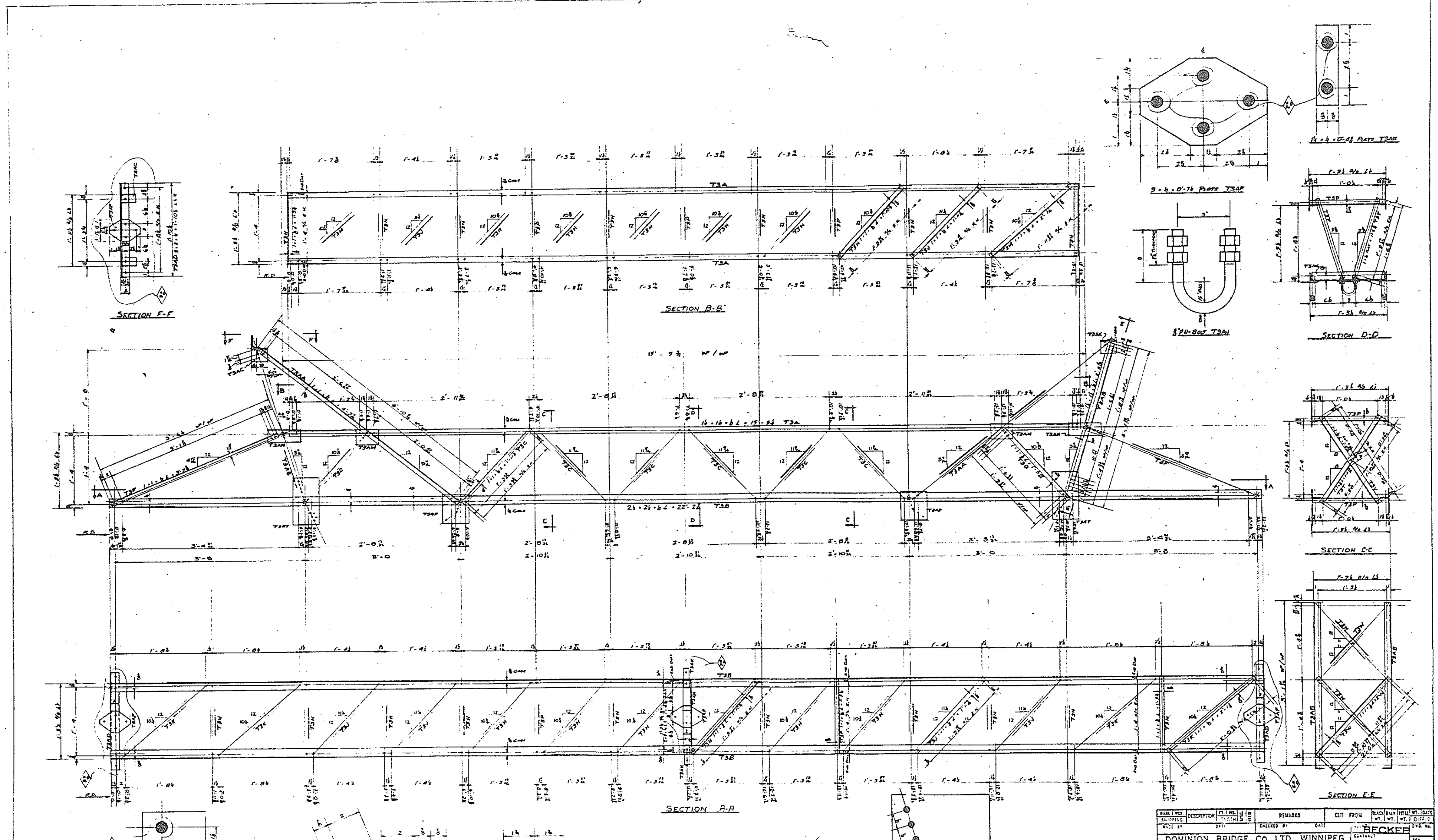
DETAIL UNIVERSITY OF MANITOBA MODEL TOWER

DIAG. REF.

CONT H-5957

DRAWN D.E.N. DATE JUNE 64 | CHECKED L.L.P. DATE JUNE/64 | HOLES 7/16" Ø | PAINT GALV. | 2

DOMINION BRIDGE CO. LTD. WINNIPEG | BECKER | REF



NOTE:

- FOR MATERIAL LIST SEE DWG. NO. 4
- FOR BOLT LIST SEE DWG. NO. 2
- MINIMUM END DISTANCE ⅞"

DETAIL: UNIVERSITY OF MANITOBA MODEL TOWER		DWG REF	CONT M.5377
DRAWN E.E.L. DATE JUNE 1964	CHECKED H.E.N. DATE JUNE 1964	HOLES $\frac{7}{16}$" Ø UNLESS NOTED	PAINT GAY	DWG. NO 3
DOMINION BRIDGE CO. LTD. WINNIPEG		BECKER	REV.