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AUTH.NAME AUTHOR AFFILIATION
UHRIG,R.E. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
EISENHUT,D.G. Division of Licensing

SUBJECT: Forwards responses to action items resulting from 820730 meeting w/NRC & Ebasco re design of concrete expansion annchors to account for base plate flexibility.

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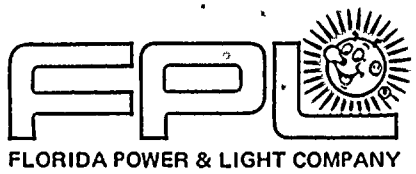


FLORIDA POWER & LIGHT COMPANY

September 21, 1982
L-82-408

Office of Nuclear Reactor Regulations
Attention: Mr. Darrell G. Eisenhut, Director
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Eisenhut:

Re: St. Lucie Unit No. 2
Docket No. 50-389
Response to Base Plate Flexibility Action Items

Enclosed please find our resonse to the action items resulting from the July 30, 1982 meeting between the NRC, FPL and Ebasco regarding the design of concrete expansion anchors to account for base plate flexibility.

Should you have any questions please contact us accordingly.

Very truly yours,

Robert E. Uhrig
Vice President
Advanced Systems and Technology

REU/RS/jea

Attachment

cc: J. P. O'Reilly, Region II
Harold F. Reis, Esquire

B001

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE UNIT 2
RESPONSE TO ACTION ITEMS FROM JULY 30, 1982
MEETING REGARDING CONCRETE EXPANSION
ANCHORS WITH THE NRC

Reference: Meeting between the NRC, FPL and Ebasco of July 30, 1982 regarding the design of concrete expansion anchors to account for base plate flexibility.

Action Item 1

FPL will submit the results of the analysis of ten worst case supports selected by Bergen-Paterson by August 31, 1982.

Response to Item 1

The ten Bergen-Paterson selected cases have been analyzed using the ANSYS finite element computer program. All resulted in a factor of safety of at least 5 for bolt tension and shear. Nine additioanl cases, selected by Ebasco, were similarly analyzed. All but one resulted in a factor of safety of at least 6.5. The one exception is a main steam restraint whose analysis resulted in a factor of safety of 2.4 for bolt tension (bolt shear is negligible). This restraint is unique in that the loads are very large. The pullout force is an order of magnitude greater than that of any other expansion-anchored restraint. The design of this restraint is being modified to achieve a factor of safety of at least 4.

Analysis summary sheets for the 19 cases are enclosed (see attachments A1 through A19).

Action Item 2

FPL will submit a description of the ANSYS model and the Ebasco preprocessor program used in the analysis.

Response to Item 2

To account for the flexibilities of both the concrete expansion anchor and the baseplate, the "ANSYS" computer program was employed. This program utilizes the finite element method of analysis. To facilitate the use of the "ANSYS" program Ebasco has developed a preprocessor "EMBEDP".. A brief description of the "EMBEDP" computer program is given below. The test problem presented in section 5.0 of "Summary Report of Generic Response to USNRC IE Bulletin No. 79-02 Base Plate/Concrete Expansion Anchor Bolts by Teledyne Engineering Services, August 30, 1979", was used to verify the "EMBEDP" program. Section 5.5.3 shows the plate geometry and section 5.6.1

TABLE 1 - BOLT LOAD COMPARISON

(See Program Verification Reference)

Load Case	Bolt Number	Bolt Load (lb)	
		EMBEDP	Teledyne
Case 1 (Axial Load)	1	2324	2350
	2	2324	2350
	3	2324	2350
	4	2324	2350
Case 2 (45° Shear/ Moment)	1	2272	2316
	2	972	1024
	3	0.0	0
	4	972	1024
Case 3 (0° Shear/ Moment)	1	1860	1942
	2	1860	1942
	3	0	0
	4	0	0

Note: Primary difference is due to different formulas used for concrete spring.

gives the bolt load. Appendix F describes the load used in this verification. Input and output of the EMBEDP program involving the test problem are presented in sample problems nos. 1, 2 and 3, copies of which are attached. The ANSYS input data results from these sample problems were introduced into the ANSYS program, the output of which was then compared with that of the Teledyne report. Table 1 attached compares the EMBEDP and Teledyne results for the bolt loads.

DESCRIPTION OF MODEL

The plate is divided into a finite number of elements (STIF63). While dividing the plate into elements it is desirable to increase the number of elements in the region of expected maximum stresses. In other areas fewer elements may be used. To increase the convergence of the results it is common to have 2 rows of elements between the edge of the plate and the bolt line.

The concrete is replaced by compression-only springs (STIF10) derived from the half-space theory as given by Barkan. The total stiffness K_c of concrete subgrade is given as:

$$K_c = \frac{G_c}{1-V_c} \quad (2.2) \quad \sqrt{WL}$$

G_c = shear modulus of concrete

V_c = Poisson's ratio of concrete

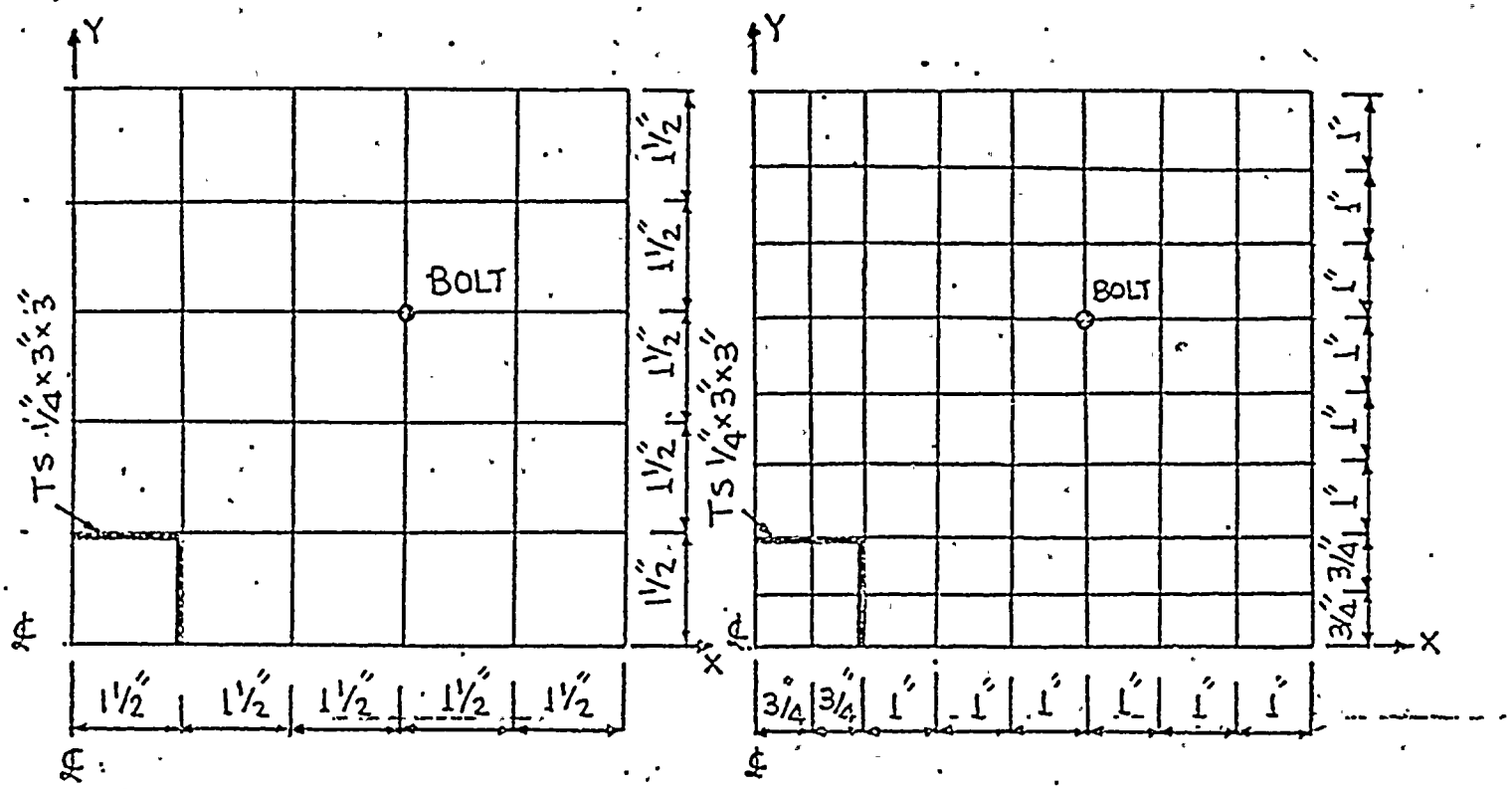
W = width of base plate

L = length of base plate

Compression springs representing the concrete subgrade are attached to each node of the model.

Bolts are represented by tension springs (STIF10) in the longitudinal direction. The longitudinal stiffnesses of the bolts are obtained from tests performed at the jobsite by the bolt manufacturer.

Shear stiffnesses of the bolts (STIF14) are also derived from test results. In this analysis these values were taken from "Anchor Bolt Shear and Tension Stiffness", Teledyne Engineering Services, May 25, 1979. Since the stiffness of the plate in the horizontal direction (in-plane stiffness) is relatively large compared to the shear stiffness of the bolt, the shear force distribution among the bolts (all of the same type and size) is not affected by the shear stiffness of the bolt. For this reason, it is possible to distribute the total shear force among the bolts without resorting to the ANSYS analysis. However, in the analyses performed for St. Lucie 2, all loads, pullout and moment as well as shear, were applied in the same run in the knowledge that the shear force taken by the bolts would affect neither the tension in the bolt nor the plate stress.



(a) (b)

Plate Thickness = 3/4 inch

Model of 1/4 Plate
5 x 5 elements

Model of 1/4 Plate
8 x 8 elements

3/4"ϕ Phillips Wedge Anchor
1/4 Pull out load = 0.3495 K

Figure 1

1/4 Pull Out Load KIP	1/4 Plate			
	5 x 5 Elements		8 x 8 Elements	
	Maximum Plate Stress in KSI	Maximum Bolt Load in Kip	Maximum Plate Stress in KSI	Maximum Bolt Load in Kip
0.3495	2.19	0.3498	2.24	0.3496

Table 2

A part of the attachment is included in the model as plate elements. The load is applied to this attachment.

STUDY OF MODEL MESH SIZE

The baseplate for restraint CH-71-R1 was selected to study the effect of element sizes on the stresses and the bolt tension. This restraint baseplate is typical of the majority of expansion anchored restraint applications. Pullout load was applied to the plate. A part of the attachment was modeled as plate elements. Two computer runs were performed with the 3/4" plate divided into 5 x 5 elements and 8 x 8 elements as shown in Figure 1. Table 2 presents the values of maximum bolt load and maximum plate stress obtained from the two computer runs for 2 different mesh sizes. From these two cases it can be seen that the difference in bolt tension is small (0.06%) while the maximum stresses differ by 2.20%.

The combination of small pullout force/thick plate results in a small prying contribution. We are proceeding to analyze another case with large pullout/relatively thin plate for comparison.

EBASCO COMPUTER PROGRAM "EMBEDP"

The "EMBEDP" computer program was developed by Ebasco as a preprocessor for the "ANSYS" finite element program for baseplate and anchorage nonlinear analysis. This program automatically generates the finite element model including the load data using a minimum number of input cards. The preprocessor minimizes engineering time and allows solution of a large number of baseplate problems economically. The program has been completed and verified.

The program structure is sufficiently flexible to allow the user to exercise options in considering special features of different problems. The following special features are included and can be handled by the program:

(a) Selection of the type of element (bending only or membrane plus bending) for the baseplate - For the case with uplift force only, the bending type element can be used to reduce the computer cost.

(b) Generation of the spring constants of the concrete subgrade - using the half-space formula developed by Barkan.

(c) Consideration of the pretorque in the anchor bolts.

(d) Consideration of the friction between the baseplate and concrete surfaces. If it is required to take into account the friction between the baseplate and the concrete, the friction element (STIF52) may be included in the analysis. When this element is selected, the baseplate is automatically represented by a membrane plus bending element. (Please note that in the analyses performed for St. Lucie 2, the friction element was not used to carry shear loads.)

(e) Location and Number of bolts - Any random distribution, up to twenty bolts can be input.

(f) The attachments - any attachment having components parallel to the sides of the baseplate can be input.

"EMBEDP" together with "ANSYS" provides stresses in baseplates and forces in bolts on plate assemblies subject to various loadings.

Action Item 3

FPL will perform an analysis of a sample baseplate subjected to pullout load and moment, considering these effects applied separately, and an analysis considering these effects applied simultaneously.

Response to Item 3

Four individual load cases were considered separately. The four load cases were (1) pullout load F_z, (2) moment M_x, (3) moment M_y and (4) combined loads F_z, M_x and M_y applied simultaneously. The plate selected was CH-71-R1. Results from these cases are summarized in Table 3. It may be pointed out that the location of maximum stress is different for each load case. However, in the actual analysis using the "ANSYS" program for St. Lucie 2 critical combinations of individual loads were used. Single load applications were never considered in the analysis.

Applied Load	Maximum Bolt Tension Load	Maximum Plate Stress
$F_z = 1.398$	0.350	2.19
$M_x = 0.496$	0.026	0.20
$M_y = 2.622$	0.138	1.06
$F_z = 1.398$, $M_x = 0.496$, $M_y = 2.622$	0.512	2.72

Load in KIP
Stress in KSI

Moment in IN-KIP

- Table 3 -

Action Item 4

FPL will revise its expansion anchor design criteria to reflect a factor of safety of 15 across the board. Reference to prying calculations will be deleted.

Response to Item 4

The criteria will be revised to incorporate the following statement:

> "The use of a safety factor of 15 for all types of loading precludes the necessity of a prying calculation. Where the use of a safety factor of 15 is impractical and the presence of large loads results in a significant prying effect, baseplates shall be analyzed using the ANSYS finite element computer program."

EBASCO SERVICES INCORPORATED

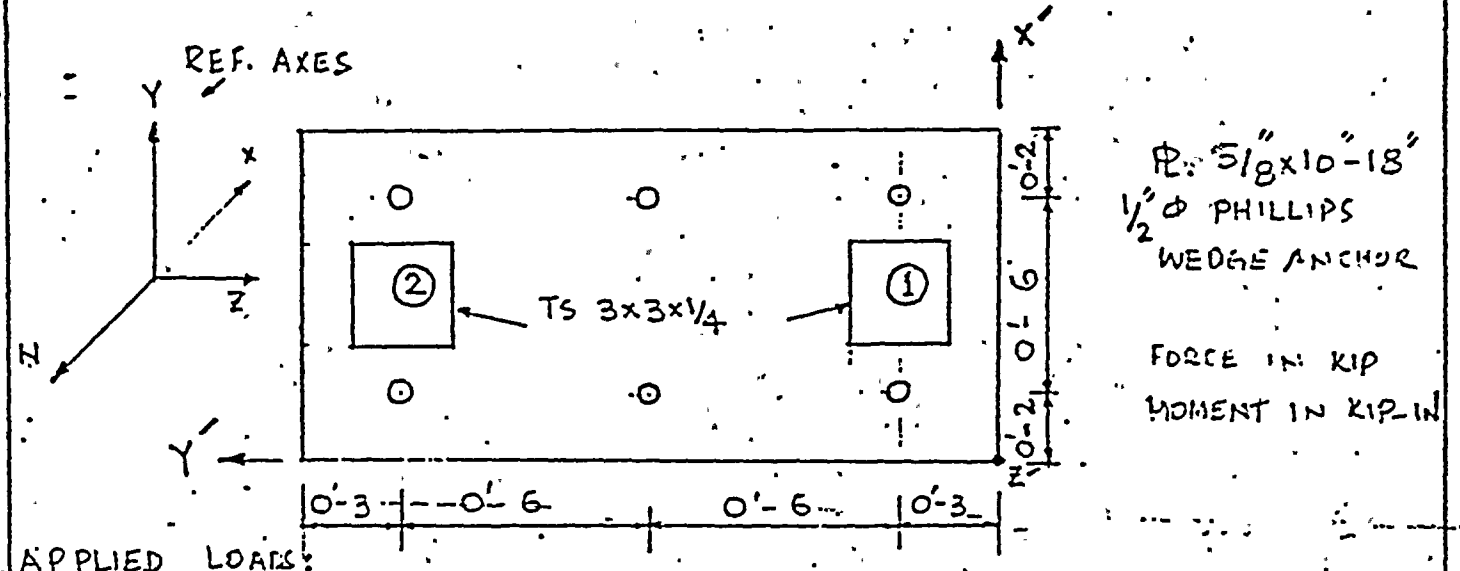
BY MZK DATE 7/30/82 ATTACHMENT A1 SHEET ___ OF ___

CHKD. BY TWL DATE 8/3/82 OFS NO. 2520.902 DEPT. NO. 550

CLIENT FPL

PROJECT ST. LUCIE #2

SUBJECT BASE PLATE ANALYSIS — SPS - 427



APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	0.15	-0.83	1.0	3.69	-7.12	0.0
②	0.15	-0.83	1.06	3.47	-7.12	0.0

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
1.49	0.282	5.87	7.1	6.0

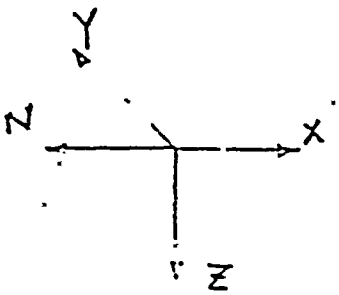
COMPUTER OUTPUT: MZKAJJM dt. 7/29/82

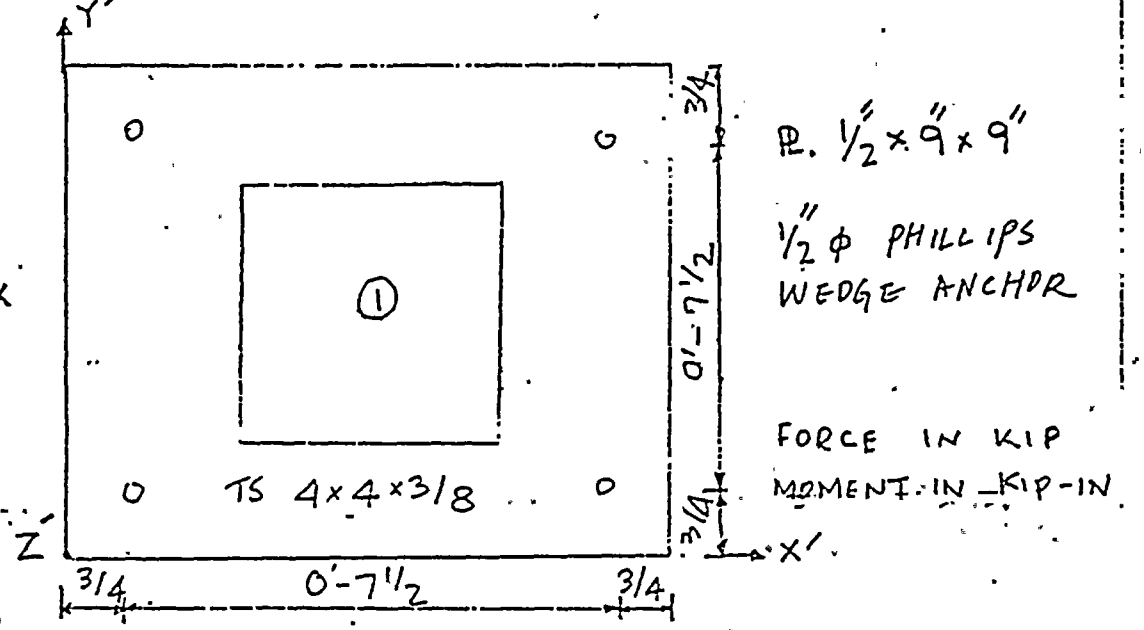
EBASCO SERVICES INCORPORATED
NEW YORK

BY MZK DATE 7/29/82
CHKD. BY TIW DATE 7/29/82
CLIENT FPL
PROJECT ST. LUCIE #2
SUBJECT BASE PLATE ANALYSIS (CC-2074-44) REV. 1.

ATTACHMENT A2 OFS NO. 2524.902 SHEET ___ OF ___ DEPT. NO. 550

REF. AXES





PL. 1/2" x 9" x 9"

1/2" ϕ PHILLIPS WEDGE ANCHOR

FORCE IN KIP
MOMENT IN KIP-IN

APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	3.600	-1.000	-2.900	7.500	9.060	5.200

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX PL STRESS (KSI)	REMARKS (KSI)
0.461	1.16	6.8 (PRINCIPAL MAX. STRESS)	Sx = 5.24 Sy = 5.18

NOTE: SX AND SY ARE STRESSES IN X AND Y DIRECTIONS RESPECTIVELY.

ULTIMATE TENSION (K)	ULTIMATE SHEAR (K)
7.1	6.0

COMPUTER OUTPUT: L12KAJLP dt. 7/29/82

EBASCO SERVICES INCORPORATED

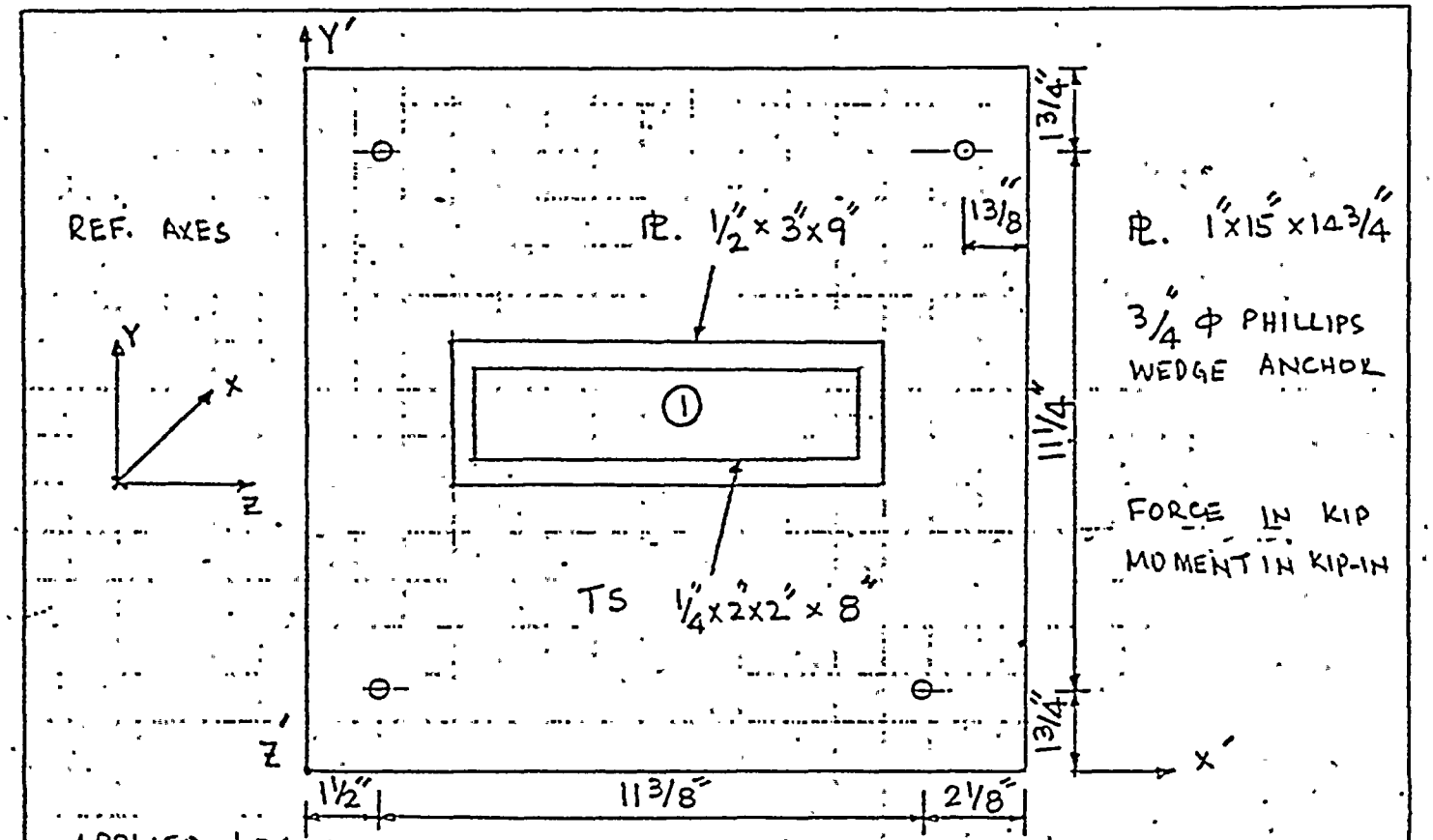
BY MZK DATE 811018 ATTACHMENT A3 SHEET ____ OF ____

CHKD. BY [illegible] DATE 8/10/82 OFS NO. 2524.902 DEPT. NO. 550

CLIENT FLΦ

PROJECT ST. LUCIE #2

SUBJECT ANCHOR PLATE ANALYSIS (CW-3000B-8151)



APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
(1)	0.08	-0.66	0.50	0.90	-1.156	-0.60

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
0.217	0.184	0.806	11.6	14.8

COMPUTER OUTPUT: MZKAJ5A dt. 811018Z

EBASCO SERVICES INCORPORATED

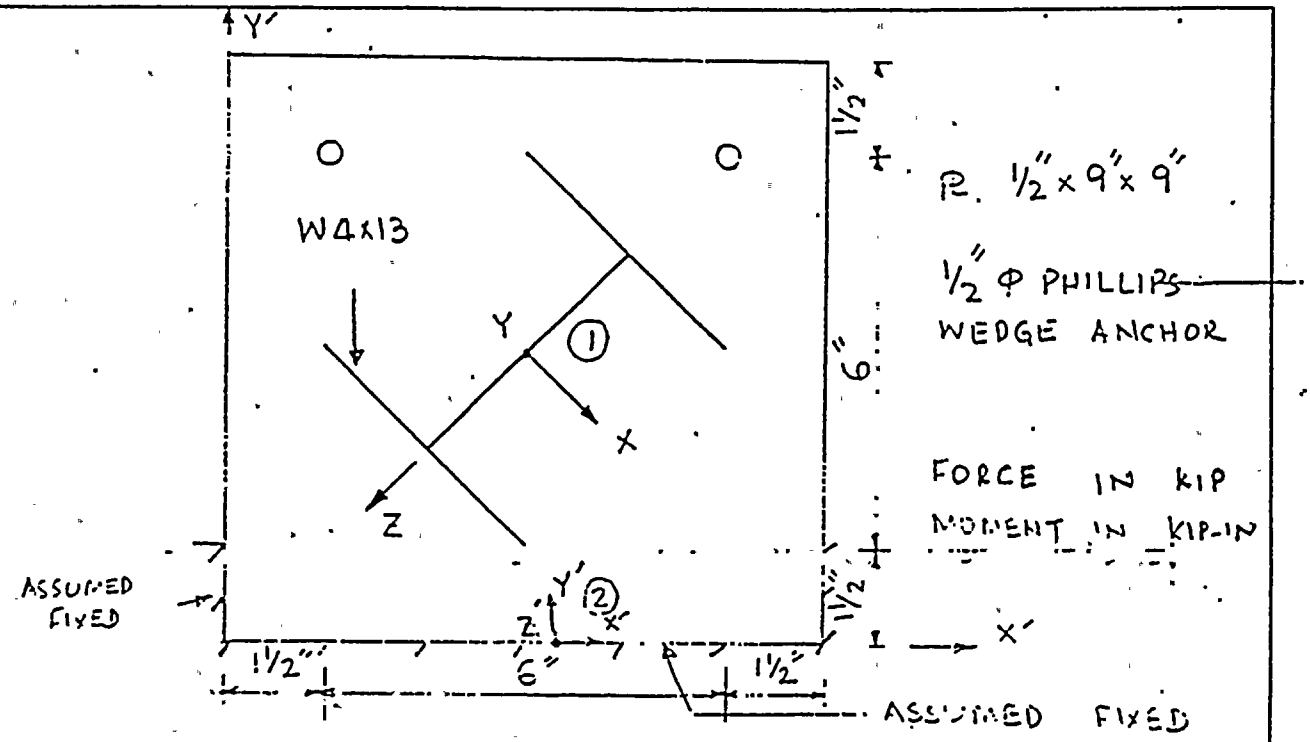
BY MZK DATE 8/12/82 ATTACHMENT A4 SHEET ___ OF ___

CHKD. BY AJC DATE: 8/12/82 OFS NO. 2524.902 DEPT. NO. 550

CLIENT FPL

PROJECT ST. LUCIE #2

SUBJECT ANCHOR PLATE ANALYSIS (CH-2081-147) Rev. R2



APPLIED LOADS: (IN X, Y, Z COORDINATE)

LOCATION OF LOADS	FX	FY	FZ	MX	MY	MZ
①	0.309	-0.515	0.309	19.930	0.0	19.930

RESULTS : (IN X', Y', Z' COORDINATES)

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX PR. STRESS (KSI)	REMARKS (KSI)
1.375	0.002	25.07 (MAX. PRINCIPAL STRESS)	fbx = 12.94 fby = 24.95

REACTIONS : (IN X', Y', Z' COORDINATES)

	ULT TENSION(K)	ULT SHEAR(K)
	7.1	6.0

TOTAL REACTION FORCE	FX'	FY'	FZ'	MX'	MY'	MZ'
② (ALONG FIXED EDGE)	-2.73×10^{-2}	0.434	-2.909	-3.318	-1.404	0.0

COMPUTER OUTPUT: MZKAJFV dt. 8/12/82

EBASCO SERVICES INCORPORATED

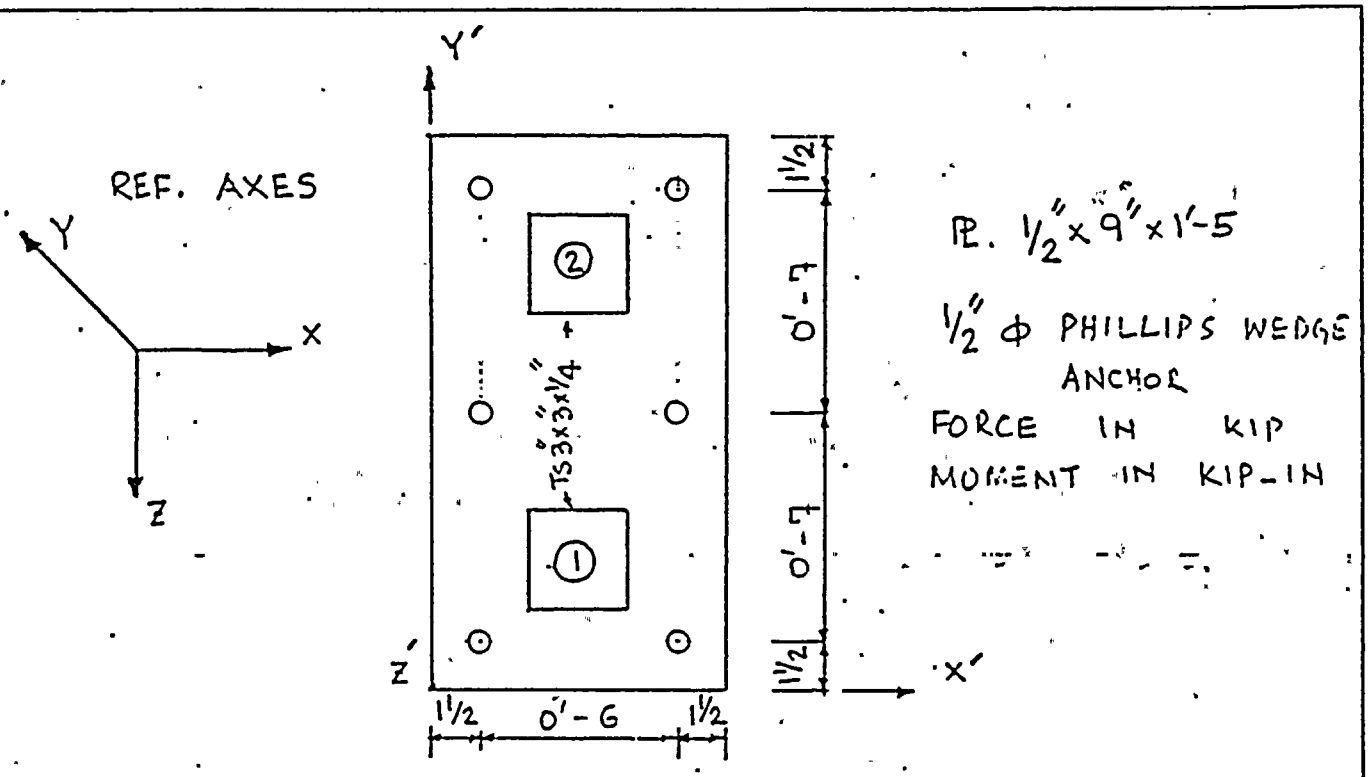
BY MZK DATE 7/27[illegible]2 ATTACHMENT A5 SHEET ____ OF ____

CHKD. BY [illegible] DATE [illegible] OFS NO. 2504.902 DEPT. NO. 350

CLIENT F L Φ

PROJECT ST. LUCIE #2

SUBJECT ANCHOR PLATE ANALYSIS (CH-2081-14)



APPLIED LOADS :

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	0.095	0.22	-1.247	-4.604	3.259	-0.057
②	0.095	0.28	0.367	-5.282	3.259	0.057

RESULTS :

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
0.41	0.09	6.78	7.1	6.0

COMPUTER OUTPUT: MZKAJBZ dt 7/19/82

531/8-81

EBASCO SERVICES INCORPORATED

ATTACHMENT A6

BY MZK DATE 7/28/82 SHEET ____ OF ____

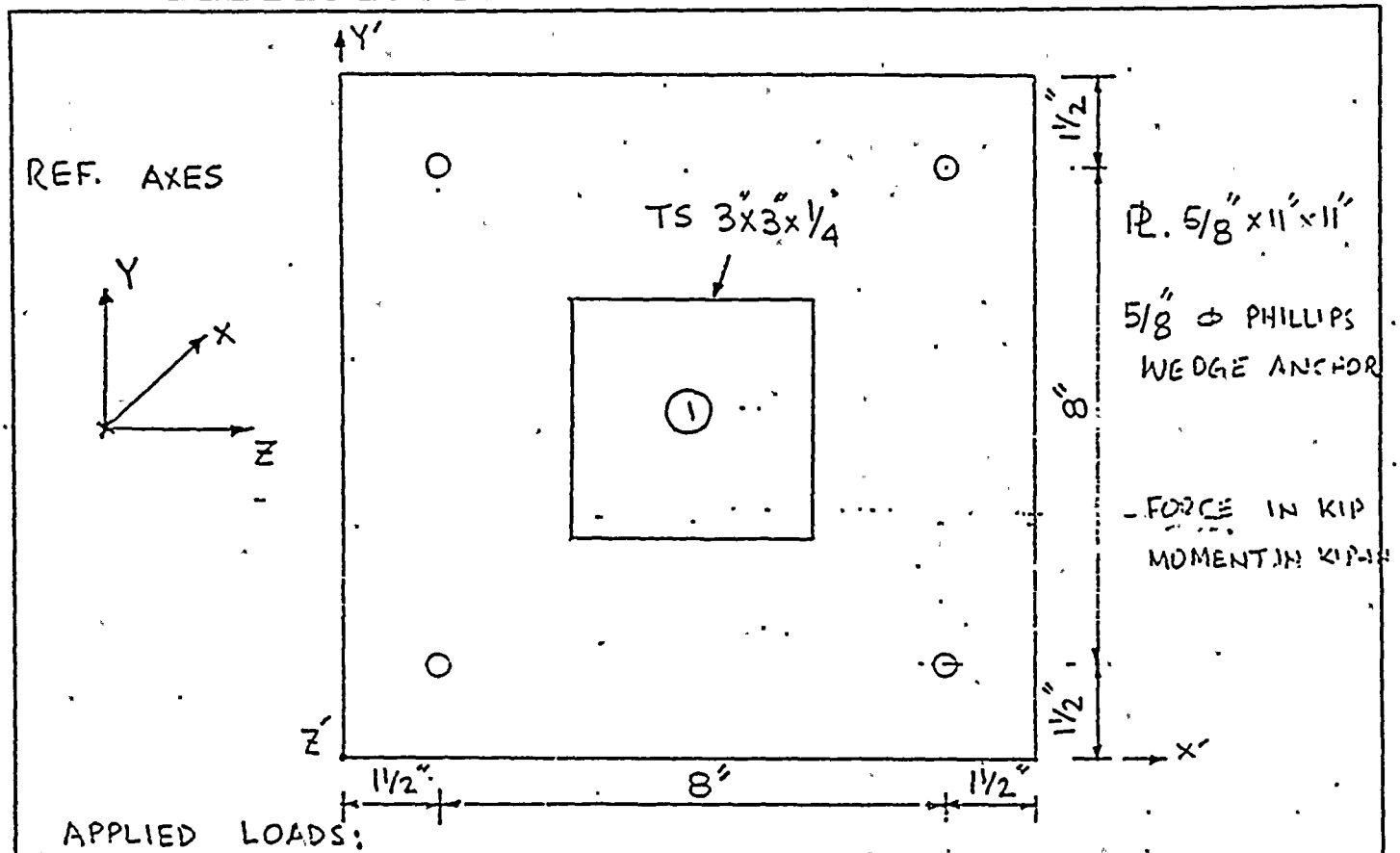
CHKD. BY T.W. DATE ____

OFS NO. 2524.902 DEPT. NO. 550

CLIENT F L Φ

PROJECT ST. LUCIE # 2

SUBJECT ANCHOR PLATE ANALYSIS (FS-2133-37)



APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①		-2.785	2.786	0.061	0.0	0.0

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
0.701	0.690	5.022	10.3	9.6

C: COMPUTER OUTPUT: MZKAJBR dt. 7/21/82

581/8-81

EBASCO SERVICES INCORPORATED

BY MZK DATE 7/27/82 ATTACHMENT A7 SHEET ___ OF ___

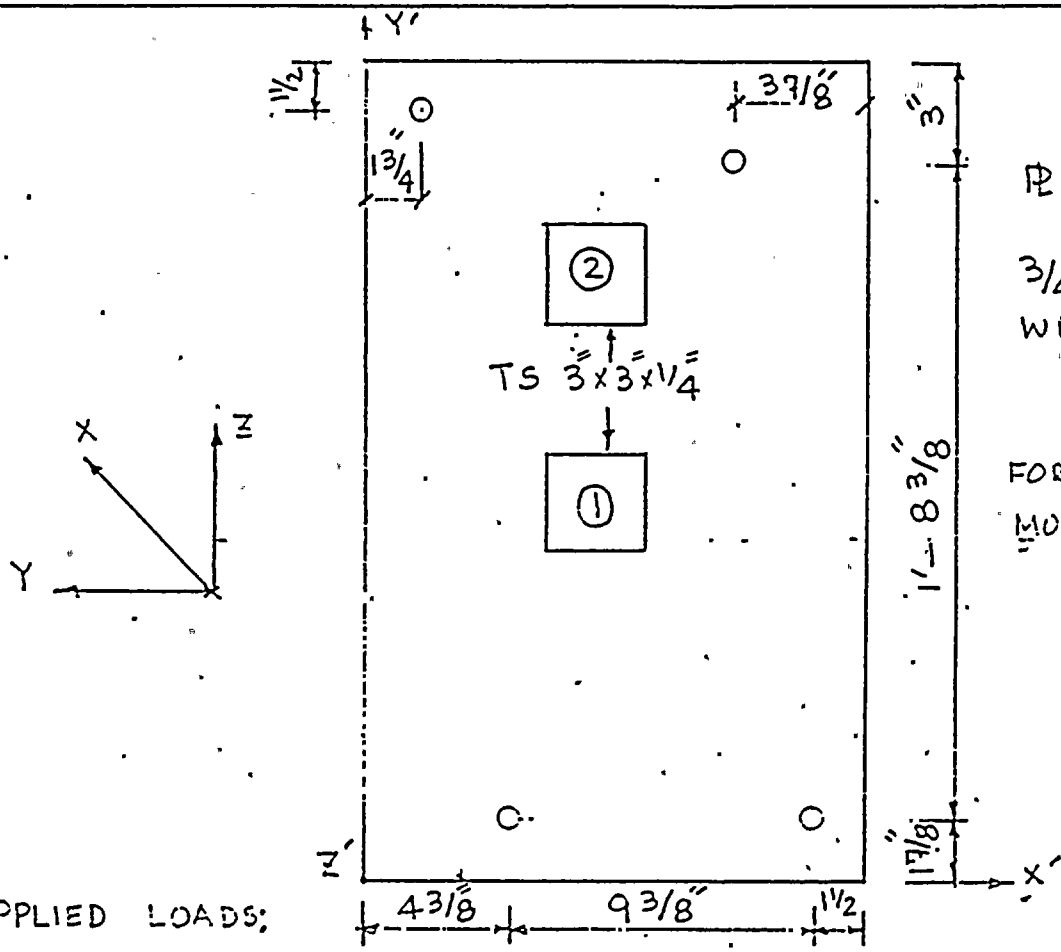
CHKD. BY [illegible] DATE 7/28/82 OFS NO. 2524.902 DEPT. NO. 550

CLIENT FPL

PROJECT ST. LUCIE #2

SUBJECT ANCHOR PLATE ANALYSIS (CW-3000B-197)

Rev. 1



LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	-0.375	.019	0.545	0.317	-4.50	0.295
②	-0.375	-0.769	0.705	2.876	-4.50	-0.295

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
1.04	0.324	1.97	11.6	14.8

COMPUTER OUTPUT: MZKAJ54 ck. 7/19/82

EBASCO SERVICES INCORPORATED

ATTACHMENT A8

BY MZK DATE 7/27/82 SHEET ____ OF ____

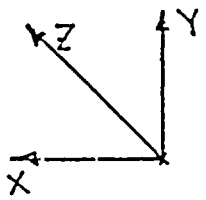
CHKD. BY ____ DATE ____ OFS NO. 252.0.003 DEPT. NO. 550

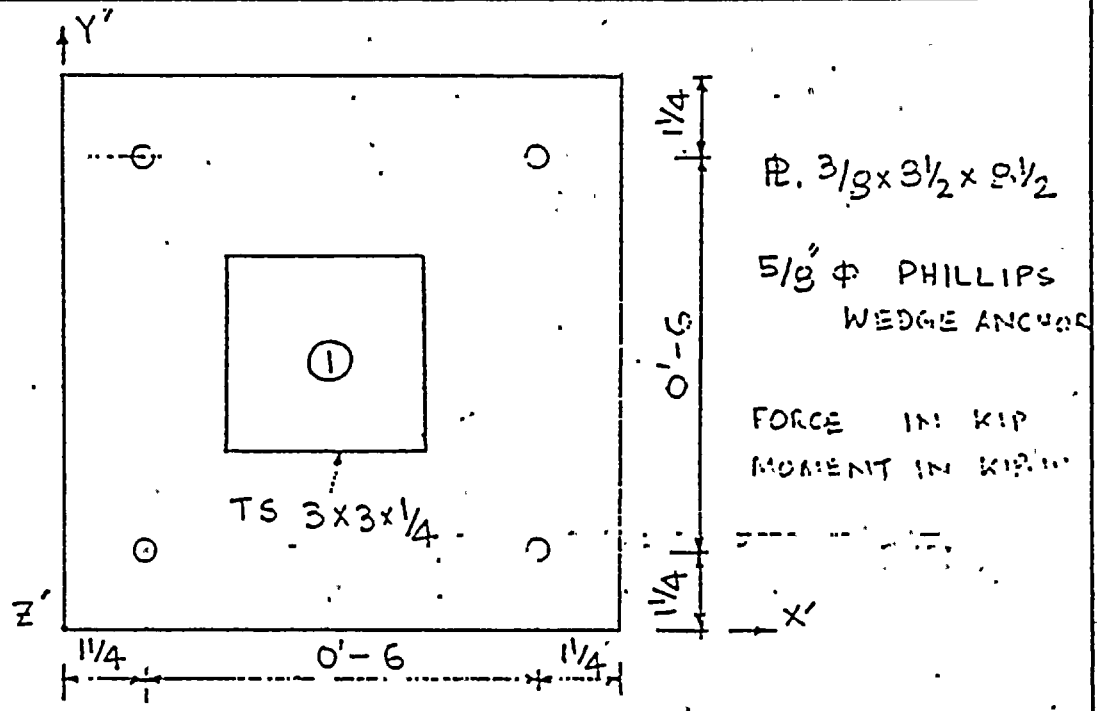
CLIENT F L Φ

PROJECT ST. LUCIE #2.

SUBJECT ANCHOR PLATE ANALYSIS (CC-2051-8)

REF. AXES





PL. 3/8 x 3 1/2 x 8 1/2

5/8" Φ PHILLIPS WEDGE ANCHOR

FORCE IN KIP

MOMENT IN KIP-IN

APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
(1)	0.0	-0.174	0.260	1.820	-0.015	0.0

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
0.203	0.044	3.81	10.3	9.6

COMPUTER OUTPUT: MZKAJ5C JJ. 7/20/82

S81/8-81

EBASCO SERVICES INCORPORATED

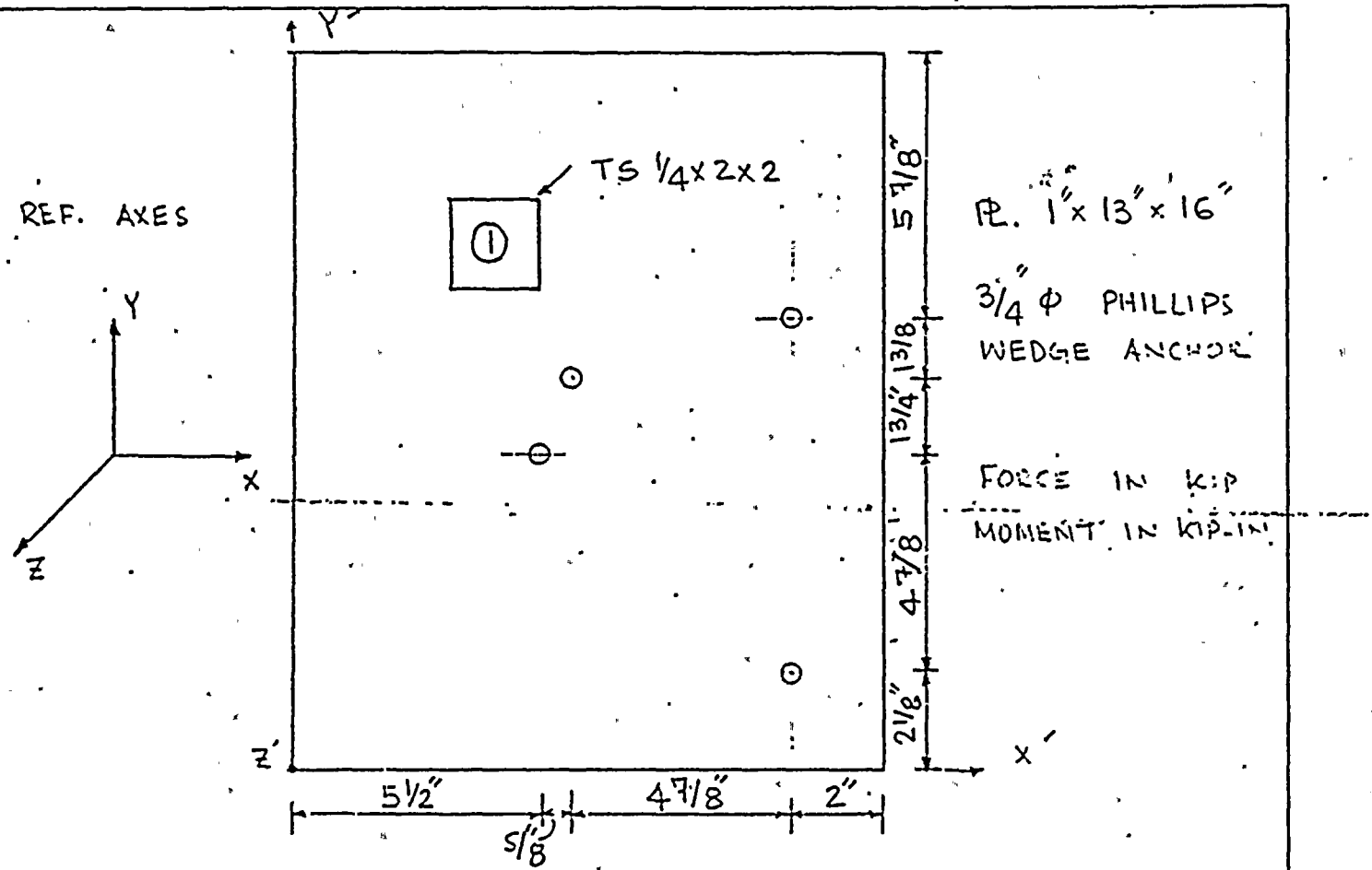
BY MZK DATE 7/28/82 ATTACHMENT A 9 SHEET ____ OF ____

CHKD. BY ____ DATE ____ OFS NO. 2520.902 DEPT. NO. 550

CLIENT F L Φ

PROJECT ST. LUCIE #2

SUBJECT ANCHOR PLATE ANALYSIS (CC-2164-41)



APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	-0.073	0.0	0.49	0.0	-0.194	0.0

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
0.308	0.035	1.001	11.6	14.8

COMPUTER OUTPUT: MZKAJ96 dt. 7/21/82

581/8-81

EBASCO SERVICES INCORPORATED

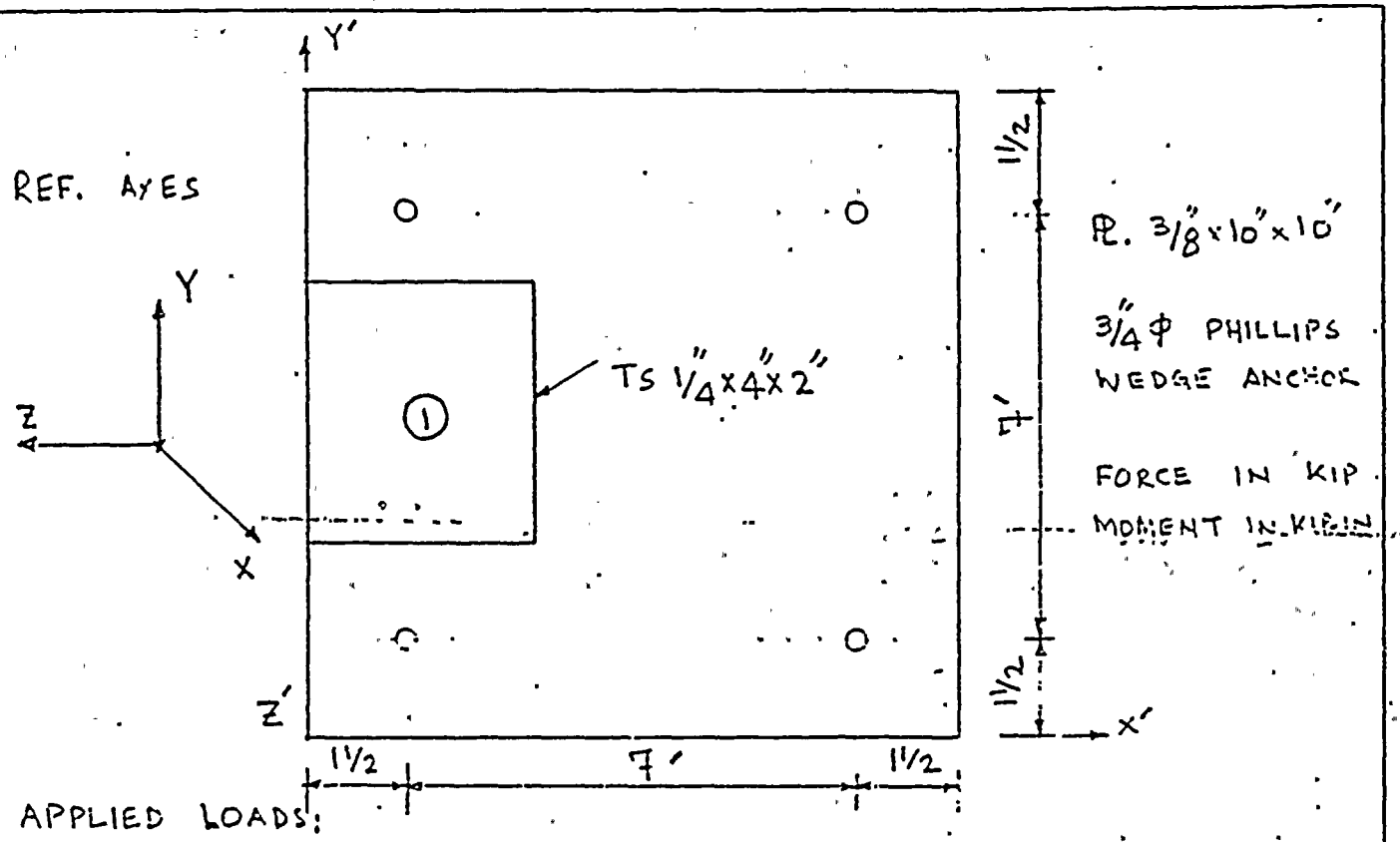
BY MZK DATE 7/28/82 ATTACHMENT A10 SHEET ____ OF ____

CHKD. BY ____ DATE ____ OFS NO. 2524.902 DEPT. NO. 550

CLIENT F L Φ

PROJECT ST. LUCIE #2

SUBJECT ANCHOR PLATE ANALYSIS (WM-2092-76)



APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
(1)	0.0	0.0	0.208	0.0	1.144	0.0

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
0.245	0.001	2.60	11.6	14.8

COMPUTER OUTPUT: MZKAJOH dt. 7/27/82

581/8-81

EBASCO SERVICES INCORPORATED

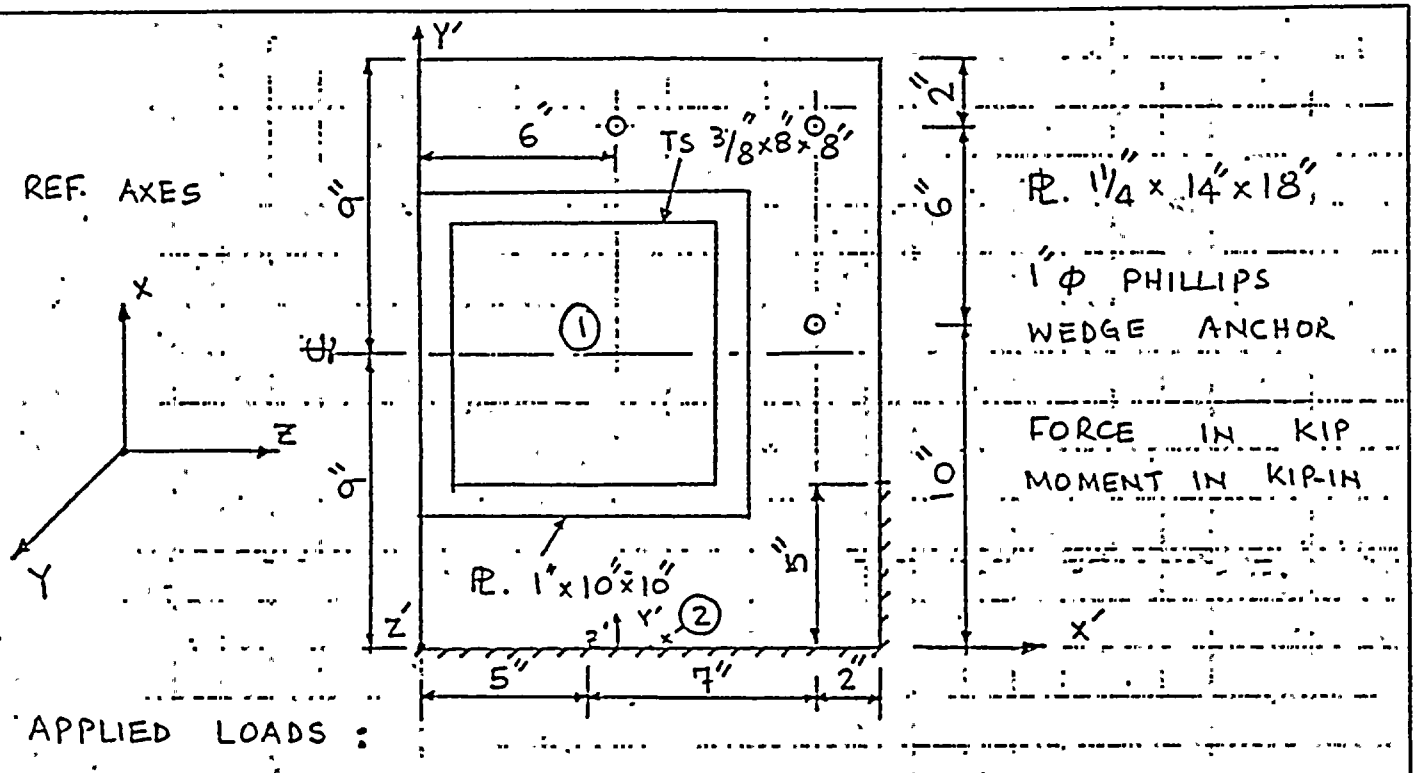
BY MZK DATE 8/12/82 ATTACHMENT A11 SHEET ___ OF ___

CHKD. BY FJC DATE 8/12/82 DFS NO. 2524.902 DEPT. NO. 550

CLIENT

PROJECT ST. LUCIE #2

SUBJECT ANCHOR PLATE ANALYSIS (MS-4100-16A)



APPLIED LOADS :

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	0.0	1.68	16.82	41.33	0.0	0.0

RESULTS :

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
9.23	0.002	13.17	21.8	23.6

REACTIONS:

TOTAL REACTION FORCE	FX'	FY'	FZ'	MX'	MY'	MZ'
② (ALONG FIXED EDGE)	0.0051	-1.677	-5.87	-26.97	-6.25	0.0

COMPUTER OUTPUT: MZKJT6S dt 8/11/82

581/8-81

EBASCO SERVICES INCORPORATED

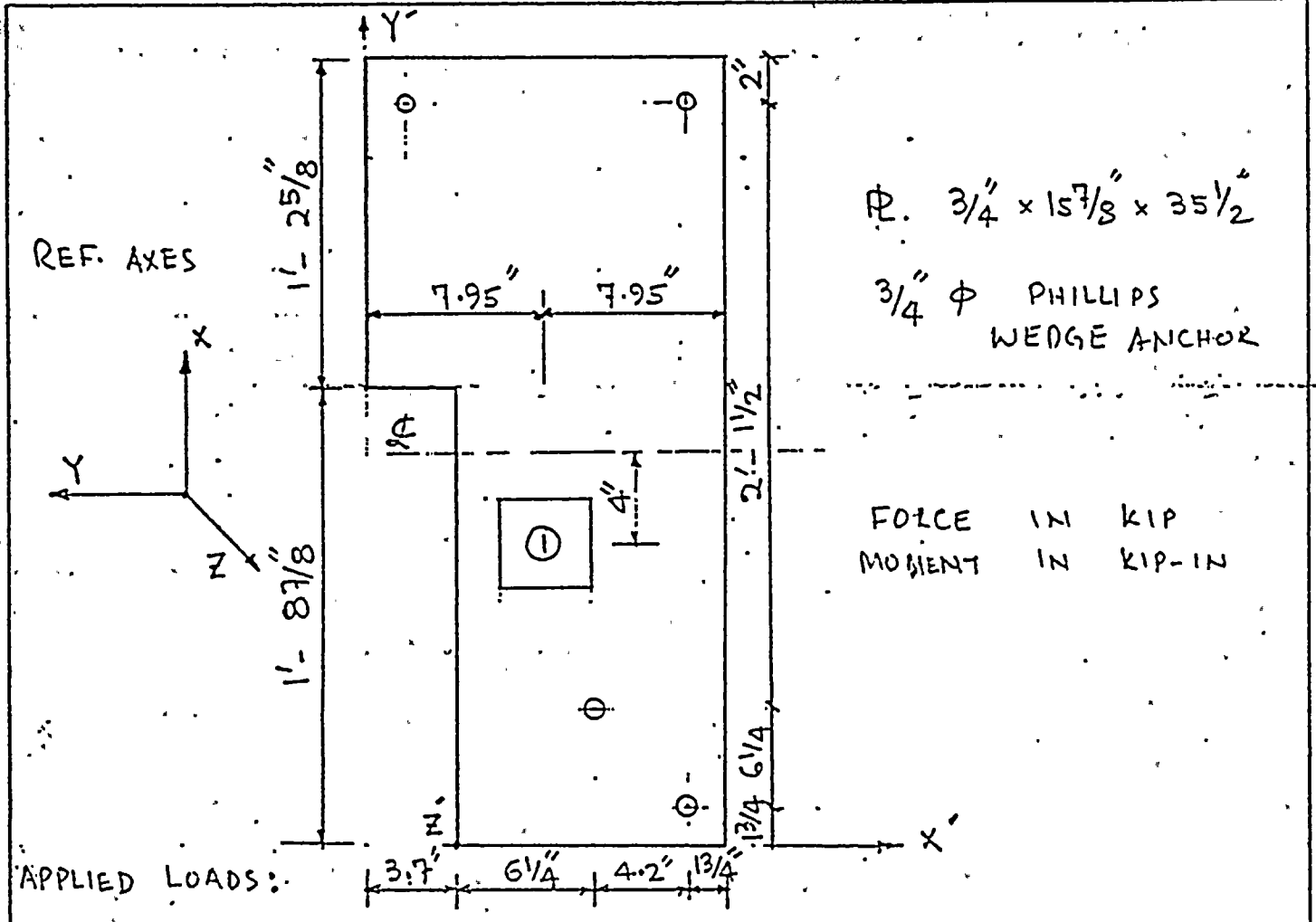
BY MZK DATE 8/5/82 NEW YORK ATTACHMENT A12 SHEET ___ OF ___

CHKD. BY AJC DATE 8/11/82 OFS NO. 2524.902 DEPT. NO. 550

CLIENT F L Φ

PROJECT ST. LUCIE #2

SUBJECT ANCHOR PLATE ANALYSIS (SI-2405-8149)



LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	0.278	-0.905	0.310	1.452	0.364	0.175

RESULTS :

MAX. BOLT LOAD (TENSION) (KIP)	MAX. SHEAR LOAD (KIP)	MAX. R. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
0.317	0.254	1.855	11.6	14.8

COMPUTER OUTPUT: MZKAJ8N dt. 8/5/82

EBASCO SERVICES INCORPORATED
NEW YORK

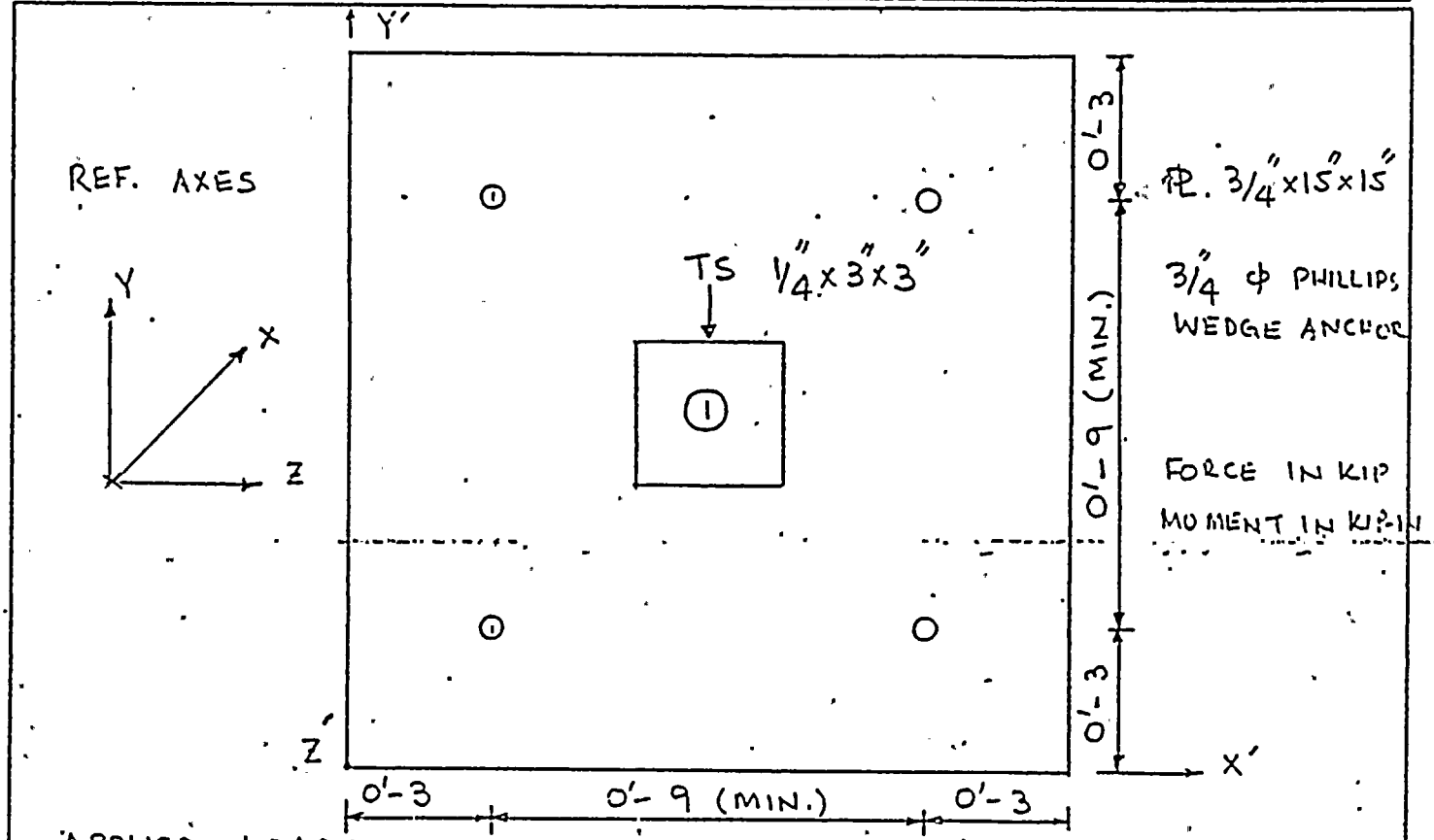
BY MZK DATE 8/11/82 ATTACHMENT A13 SHEET ___ OF ___

CHKD. BY [illegible] DATE 8/12/82 OFS NO. 2524.902 DEPT. NO. 550

CLIENT F L Φ

PROJECT ST. LUCIE # 2

SUBJECT ANCHOR PLATE ANALYSIS (CH-71-R1)



APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
(1)	0.642	0.051	1.398	0.496	2.622	-1.201

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
0.512	0.196	2.72	11.6	14.8

COMPUTER OUTPUT: MZKIT4W dt. 8/11/82

FORM 681 REV 7-71

EBASCO SERVICES INCORPORATED

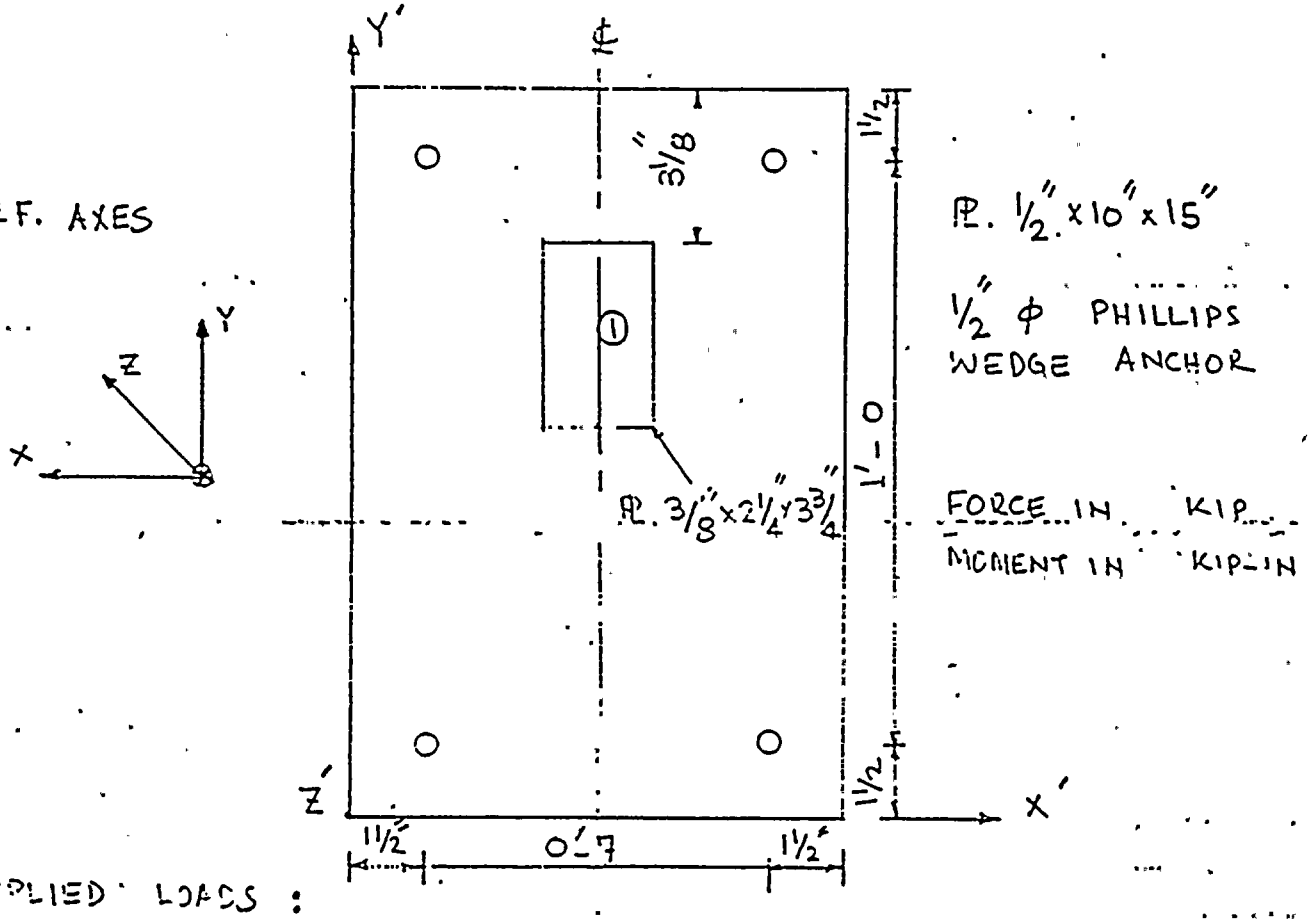
BY MZK DATE 8/11/82 ATTACHMENT A14 SHEET ___ OF ___

CHKD. BY ADC DATE 8/12/82 OFS NO. 2524.902 DEPT. NO. 550

CLIENT FPL

PROJECT ST. LUCIE #2

SUBJECT ANCHOR PLATE ANALYSIS (SPS-117)



APPLIED LOADS :

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	0.0	0.0	1.54	0.0	0.0	0.0

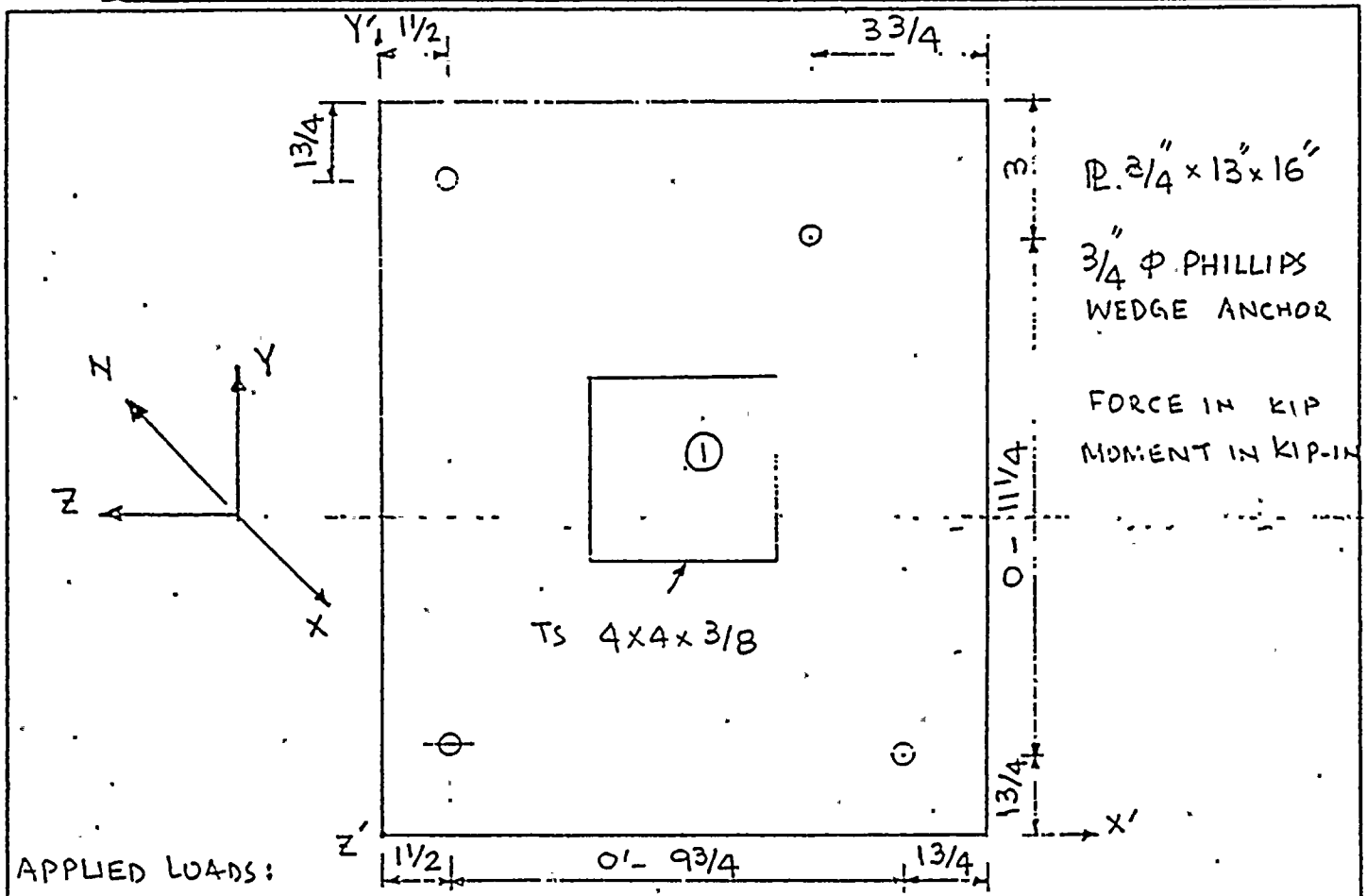
RESULTS :

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
0.661	—	9.41	7.1	6.0

COMPUTER OUTPUT: MZKITB2 dt. 8/11/82

EBASCO SERVICES INCORPORATED
NEW YORK

BY MZK DATE 6/29/82 ATTACHMENT A15 SHEET ___ OF ___
CHKD. BY CAS DATE 6/30/82 OFS NO. 252A.902 DEPT. NO. 550
CLIENT F L Φ
PROJECT ST. LUCIE #2
SUBJECT BASE PLATE ANALYSIS - SI-4203-441



APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	-2.089	-0.07	5.125	0.16	-0.444	-0.027

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
1.78	0.53	7.44	11.6	14.8

NOTE: X-AXIS IS 17° CLOCKWISE FROM NORTH

COMPUTER OUTPUT: MZKAJHN at. 6/23/82

EBASCO SERVICES INCORPORATED NEW YORK

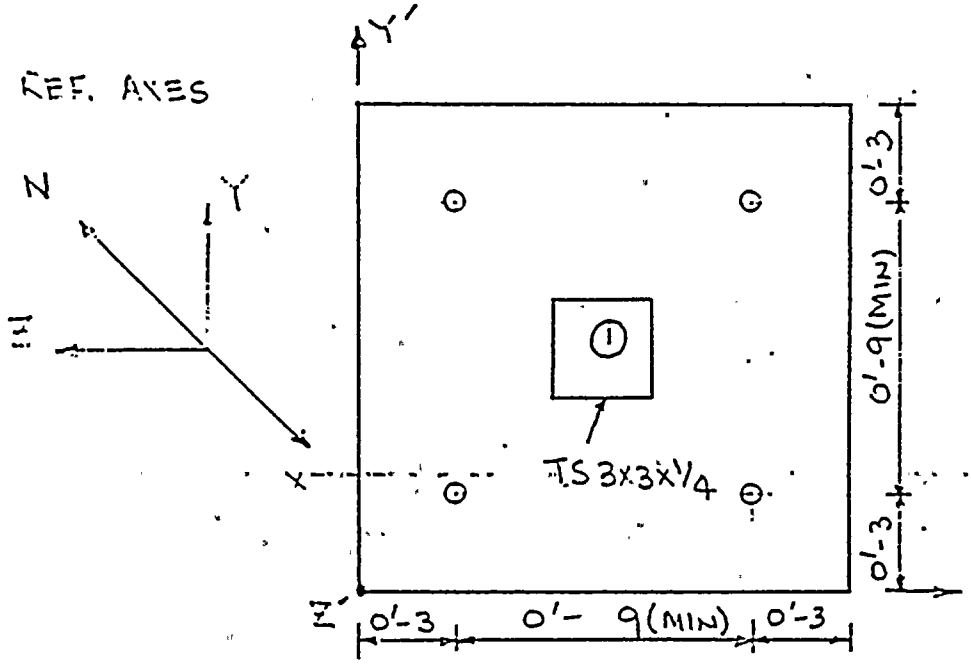
BY MZK DATE 6/29/82 ATTACHMENT A16 SHEET ___ OF ___

CHKD. BY [illegible] DATE 6/30/82 OFS NO. 2524.902 DEPT. NO. 550

CLIENT F L Φ

PROJECT ST. LUCIE # 2

SUBJECT BASE PLATE ANALYSIS - DO-18-R4



PL. 3/4 x 15" x 15"

3/4" Φ PHILLIPS WEDGE ANCHOR

FORCE IN KIP
MOMENT IN KIP-IN

APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	-0.102	0.261	0.102	-7.895	-3.086	0.0

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
0.56	0.07	3.62	11.6	14.8

COMPUTER OUTPUT: MZKAJH6 dd. 6/25/82

EBASCO SERVICES INCORPORATED
NEW YORK

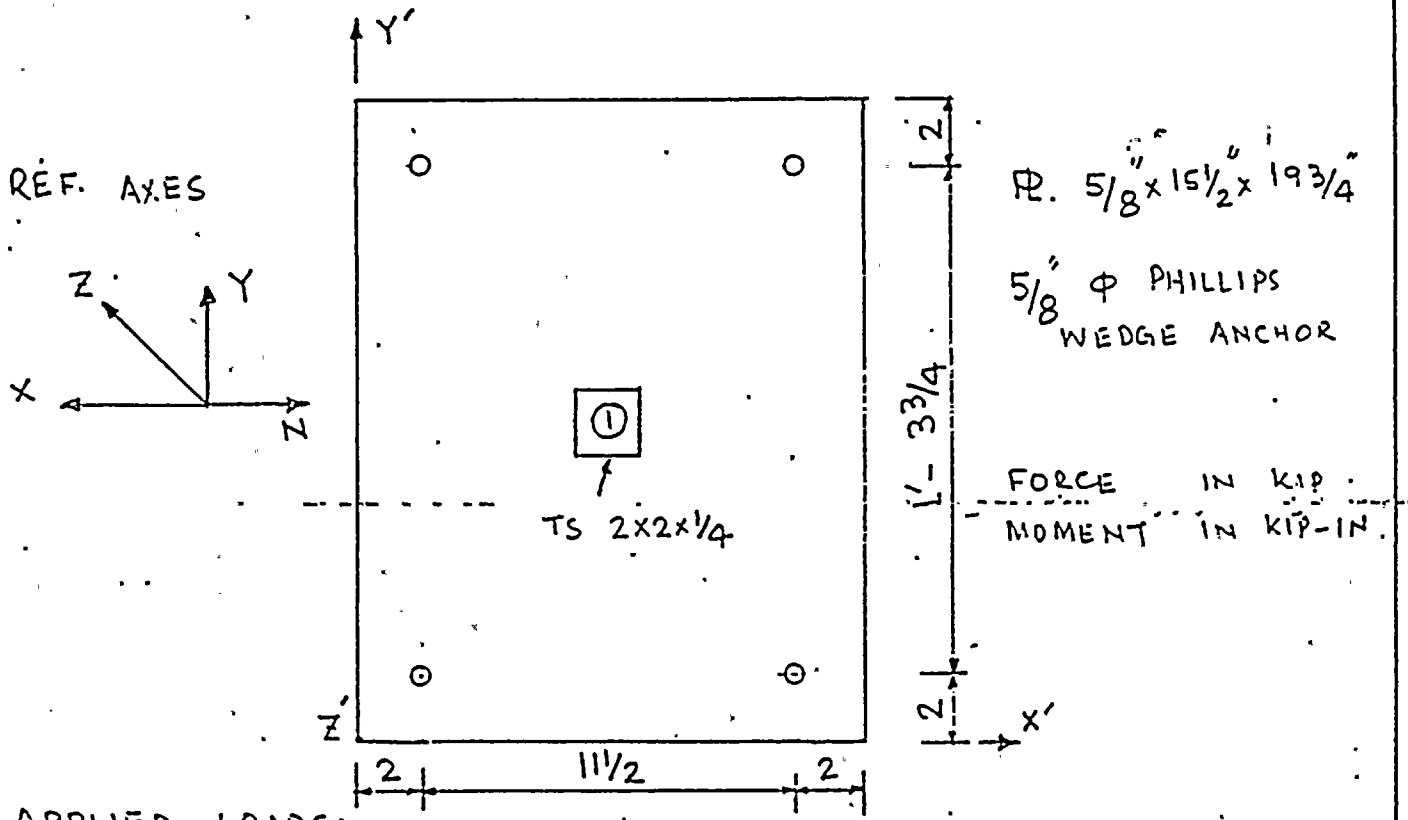
BY MZK DATE 6/30/82 ATTACHMENT A17 SHEET ___ OF ___

CHKD. BY CHS DATE 6/30/82 OFS NO. 2524.902 DEPT. NO. 550

CLIENT F L Φ

PROJECT ST. LUCIE #2

SUBJECT BASE PLATE ANALYSIS — (CC-2051-5)



APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	0.0	-0.034	0.46	0.16	0.0	0.0

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
0.13	0.01	1.91	10.3	9.6

COMPUTER OUTPUT: MZKAJ2V dt. 6/30/82

EBASCO SERVICES INCORPORATED — NEW YORK

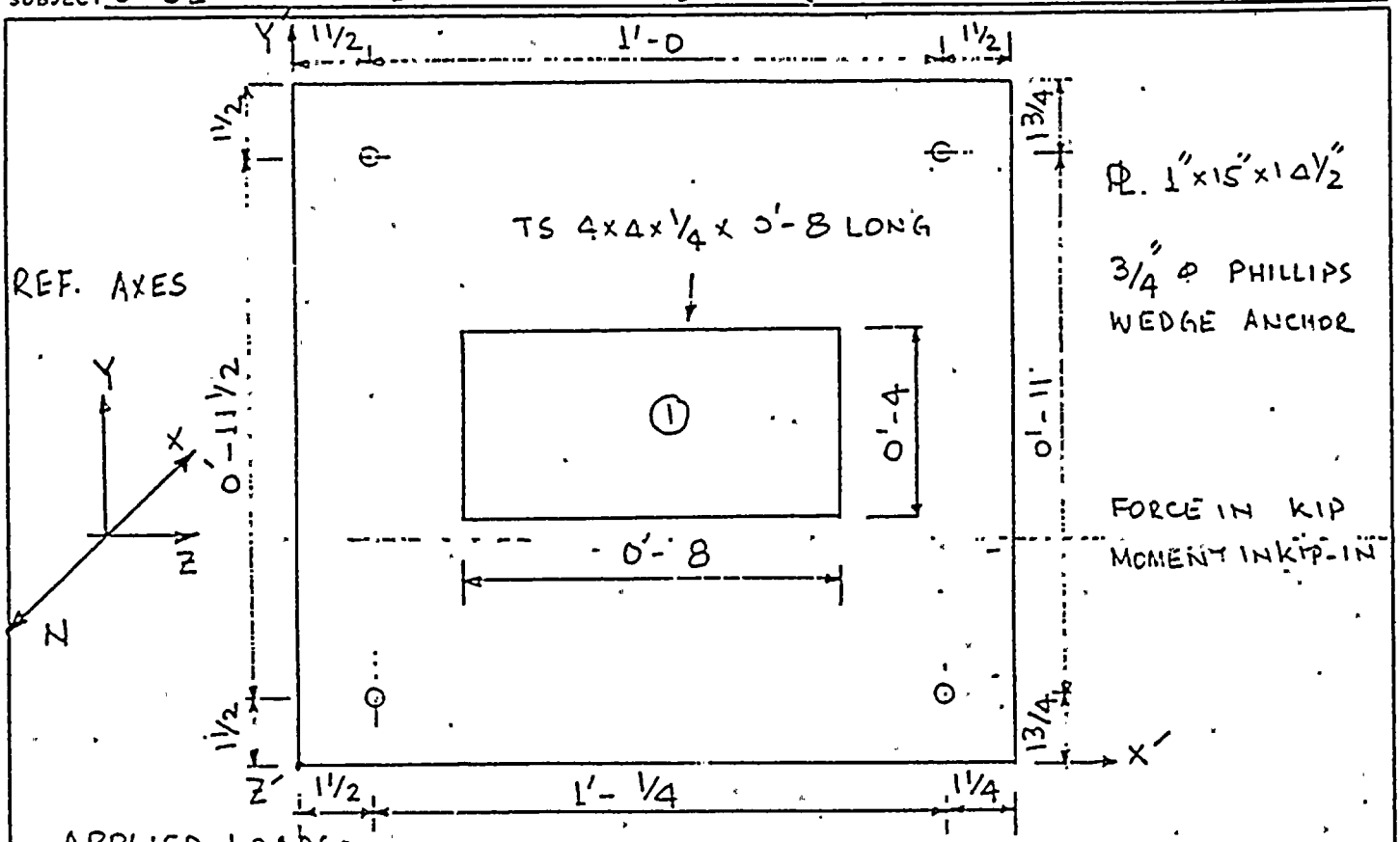
BY MZK DATE 6/30/82 — ATTACHMENT A18 — SHEET ___ OF ___

CHKD. BY CHS DATE 6/30/82 — OFS NO. 2524.902 — DEPT. NO. 550

CLIENT F L P

PROJECT ST. LUCIE #2

SUBJECT BASE PLATE ANALYSIS - (CW-3000B-8129)



APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	0.041	0.0	1.099	-13.338	-1.029	0.686

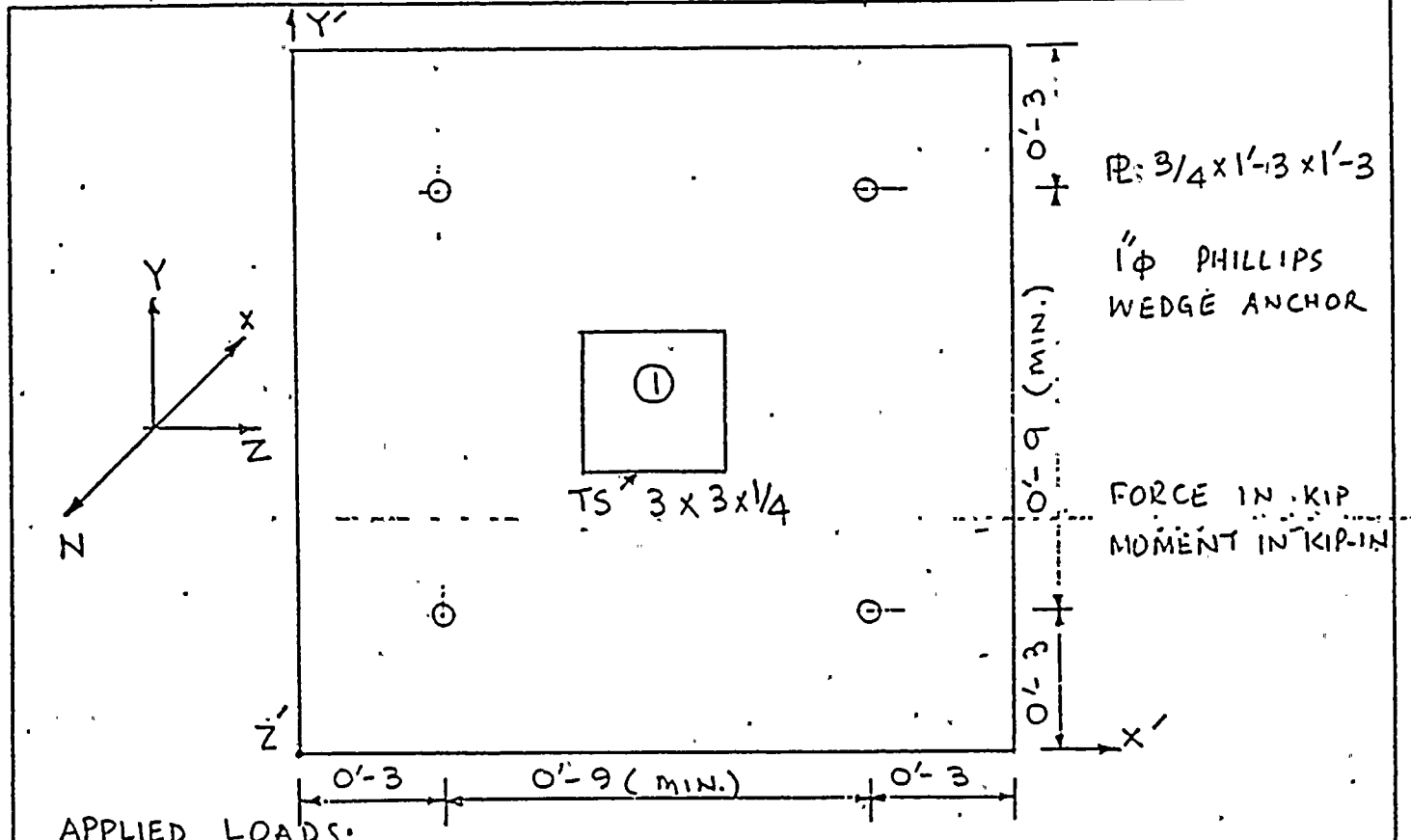
RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
0.86	0.014	2.45	11.6	14.8

COMPUTER OUTPUT: MZKAJ47 dt. 6/30/82

EBASCO SERVICES INCORPORATED
NEW YORK

BY MZK DATE 6/30/82 ATTACHMENT A19 SHEET ___ OF ___
CHKD. BY CHS DATE 6/30/82 OFS NO. 2520.902 DEPT. NO. 550
CLIENT F L P
PROJECT ST. LUCIE #2
SUBJECT BASE PLATE ANALYSIS (CH - 85-R6)



APPLIED LOADS:

LOCATION OF LOAD	FX'	FY'	FZ'	MX'	MY'	MZ'
①	0.0	−1.343	1.114	17.474	0.0	0.0

RESULTS:

MAX. BOLT LOAD (TENSION) (KIP)	MAX. BOLT SHEAR (KIP)	MAX. PL. STRESS (KSI)	ULTIMATE TENSION (KIP)	ULTIMATE SHEAR (KIP)
1.50	0.34	7.66	21.8	23.6

COMPUTER OUTPUT: MZKAJ KP dt. 6/25/82

SAMPLE PROBLEM

NO. 1

```
SJC,T100,P3,EC100.          ,SJ,CHEN,
ATTACH,LGA,EMBEDP2616,ID=SJC.
LGA.
REWIND,DATA.
ATTACH,A,R3ANSYS67ECS.
LIBRARY,A.
RFL,170000.
FILE,TAPE11,BT=C,RT=W,FO=SQ,SPR=YES,USE.
ANSYS,DATA.
REWIND,INPUT.
COPYSBF,INPUT,OUTPUT.
BASEPLATE TEST RUN---TELEDYNE TEST LOAD NO. 1
 S J CHEN
XSEG    1.25        1.125       1.125       1.5         +A1
+A1     1.5         1.125       1.125       1.25
YSEG    1.25        1.125       1.125       1.5         +A1
+A1     1.5         1.125       1.125       1.25
PLTK    0.375
FRC     5100.
ESR     29000.
ESP     29000.
NUS     0.3
NUC     0.17
BOLT    273.        2           8           2           8+A1
+A1                 2           2           8           8
FZ      8.8
AHSEG   0.25        4     4     6     4
AHSEG   0.25        6     4     6     6
AHSEG   0.25        4     4     4     6
AHSEG   0.25        4     6     6     6
OPT                                 1
END
```

BASEPLATE TEST RUN---TELEDYNE TEST LOAD NO. 1

**** BASE PLATE MESH INFORMATION****

NO. OF GRID IN X	NO. OF GRID IN Y	X-DIMENSION	Y-DIMENSION
9	9	10.000	10.000

X-COORD.=	0.000	1.250	2.375	3.500	5.000	6.500	7.625	8.750	10.000
Y-COORD.=	0.000	1.250	2.375	3.500	5.000	6.500	7.625	8.750	10.000

**** MATERIAL PROPERTIES ****

PLATE THK	E OF PLATE	E OF BOLT	E OF CONCRET	MU STEEL	MU OF CONCRETE
.37500E+00	.29000E+05	.29000E+05	.51000E+04	.30000E+00	.17000E+00

****RC SPRING CONSTANT AT EACH NODE****

.2257E+03	.4288E+03	.4062E+03	.4739E+03	.5416E+03	.4739E+03	.4062E+03	.4288E+03	.2257E+03
.4288E+03	.8146E+03	.7718E+03	.9004E+03	.1029E+04	.9004E+03	.7718E+03	.8146E+03	.4288E+03
.4062E+03	.7718E+03	.7311E+03	.8530E+03	.9749E+03	.8530E+03	.7311E+03	.7718E+03	.4062E+03
.4739E+03	.9004E+03	.8530E+03	.9952E+03	.1137E+04	.9952E+03	.8530E+03	.9004E+03	.4739E+03
.5416E+03	.1029E+04	.9749E+03	.1137E+04	.1300E+04	.1137E+04	.9749E+03	.1029E+04	.5416E+03
.4739E+03	.9004E+03	.8530E+03	.9952E+03	.1137E+04	.9952E+03	.8530E+03	.9004E+03	.4739E+03
.4062E+03	.7718E+03	.7311E+03	.8530E+03	.9749E+03	.8530E+03	.7311E+03	.7718E+03	.4062E+03
.4288E+03	.8146E+03	.7718E+03	.9004E+03	.1029E+04	.9004E+03	.7718E+03	.8146E+03	.4288E+03
.2257E+03	.4288E+03	.4062E+03	.4739E+03	.5416E+03	.4739E+03	.4062E+03	.4288E+03	.2257E+03

**** SPRING CONSTANTS****

SUM OF RC SPRING	BOLT SPRING			
.5777E+05	.2730E+03	.2730E+03	.2730E+03	.2730E+03

****BOLT LOCATION****

X-COORD.=	1.250	8.750	1.250	8.750
Y-COORD.=	1.250	1.250	8.750	8.750

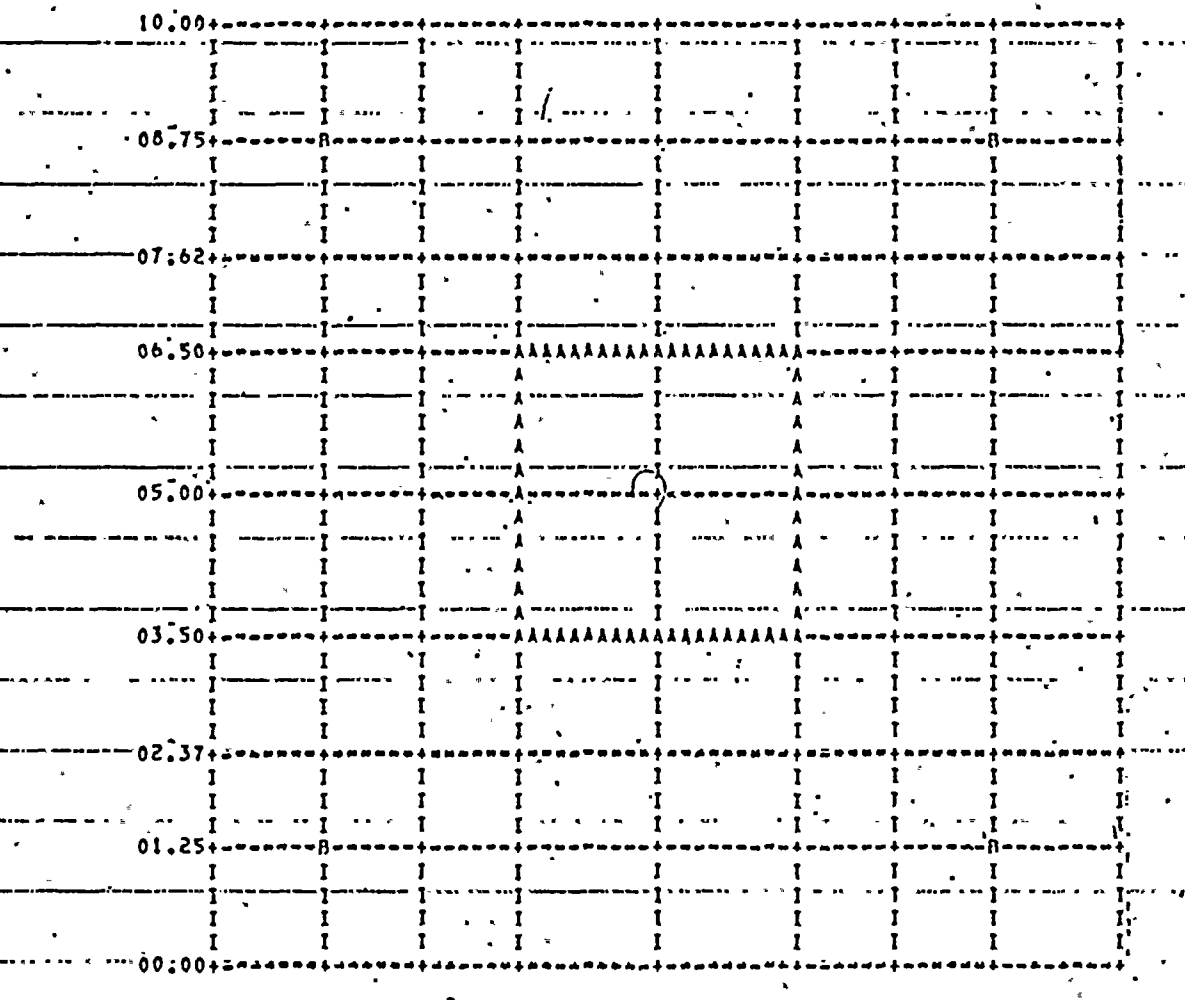
****AREA CENTER OF ATTACHMENT****

XC= 5.00YC= 5.00ZC= 3.00

****APPLIED FORCE AND MOMENT****

FORCE COMP.	NODE NO.	FORCE-MAGNITUDE
FZ	9999	6.80000

BASEPLATE TEST RUN---TELEDYNE TEST LOAD NO. 1



```
          **********ANSYS INPUT DATA LISTING (TAPE18) **********

          6    12    18    24    30    36    42    48    54    60    66    72    78
          V    V     V     V     V     V     V     V     V     V     V     V     V
  1  BASEPLATE TEST RUN---TELEDYNE TEST,LOAD NO. 1
  2  S J CHEN
  3                              99                1
  4                                                      0
  5     1 86 00  0
  6     2 10 11  0
  7     3 10 10  0
  8     4 63 00  0
  9     5  4 00  0
 10    1
 11   .3750E+00
 12   .3906E+00
 13   .7422E+00
 14   .7031E+00
 15   .8203E+00
 16   .9375E+00
 17   .8203E+00
 18   .7031E+00
 19   .7422E+00
 20   .3906E+00
 21   .7422E+00
 22   .1410E+01
 23   .1336E+01
 24   .1559E+01
 25   .1781E+01
 26   .1559E+01
 27   .1336E+01
 28   .1410E+01
 29   .7422E+00
 30   .7031E+00
 31   .1336E+01
 32   .1266E+01
 33   .1477E+01
 34   .1688E+01
 35   .1477E+01
 36   .1266E+01
 37   .1336E+01
 38   .7031E+00
 39   .8203E+00
 40   .1559E+01
 41   .1477E+01
 42   .1723E+01
 43   .1969E+01
 44   .1723E+01
 45   .1477E+01
 46   .1559E+01
 47   .8203E+00
 48   .9375E+00
 49   .1781E+01
 50   .1688E+01
      A    A    A    A    A    A    A    A    A    A    A    A    A
```

```
                6    12    18    24    30    36    42    48    54    60    66    72    78
                V     V     V     V     V     V     V     V     V     V     V     V     V
    51   .1969E+01
    52   .2250E+01
    53   .1969E+01
    54   .1688E+01
    55   .1781E+01
    56   .9375E+00
    57   .8203E+00
    58   .1559E+01
    59   .1477E+01
    60   .1723E+01
    61   .1969E+01
    62   .1723E+01
    63   .1477E+01
    64   .1559E+01
    65   .8203E+00
    66   .7031E+00
    67   .1336E+01
    68   .1266E+01
    69   .1477E+01
    70   .1688E+01
    71   .1477E+01
    72   .1266E+01
    73   .1336E+01
    74   .7031E+00
    75   .7022E+00
    76   .1410E+01
    77   .1336E+01
    78   .1559E+01
    79   .1781E+01
    80   .1559E+01
    81   .1336E+01
    82   .1410E+01
    83   .7022E+00
    84   .3906E+00
    85   .7022E+00
    86   .7031E+00
    87   .8203E+00
    88   .9375E+00
    89   .8203E+00
    90   .7031E+00
    91   .7022E+00
    92   .3906E+00
    93   .9010E-02
    94   .9010E-02
    95   .9010E-02
    96   .9010E-02
    97   .2500E+00
    98   .2500E+00
    99   .2500E+00
   100   .2500E+00
         A     A     A     A     A     A     A     A     A     A     A     A     A
```

```
 **********ANSYS INPUT DATA LISTING (TAPE10) **********

          6    12    18    24    30    36    42    48    54    60    66    72    78
          V     V     V     V     V     V     V     V     V     V     V     V     V
  101 .1000E+03 .1000E+06 .1000E+06 .1000E+01 .1000E+01
  102       -1
  103       1     2    11    10                          1     1     1
  104       2     3    12    11                          1     1     1
  105       3     4    13    12                          1     1     1
  106       4     5    14    13                          1     1     1
  107       5     6    15    14                          1     1     1
  108       6     7    16    15                          1     1     1
  109       7     8    17    16                          1     1     1
  110       8     9    18    17                          1     1     1
  111       1    82                                      2     2     2
  112       2    83                                      2     2     3
  113       3    84                                      2     2     4
  114       4    85                                      2     2     5
  115       5    86                                      2     2     6
  116       6    87                                      2     2     7
  117       7    88                                      2     2     8
  118       8    89                                      2     2     9
  119       9    90                                      2     2    10
  120      10    11    20    19                          1     1     1
  121      11    12    21    20                          1     1     1
  122      12    13    22    21                          1     1     1
  123      13    14    23    22                          1     1     1
  124      14    15    24    23                          1     1     1
  125      15    16    25    24                          1     1     1
  126      16    17    26    25                          1     1     1
  127      17    18    27    26                          1     1     1
  128      10    91                                      2     2    11
  129      11    92                                      2     2    12
  130      12    93                                      2     2    13
  131      13    94                                      2     2    14
  132      14    95                                      2     2    15
  133      15    96                                      2     2    16
  134      16    97                                      2     2    17
  135      17    98                                      2     2    18
  136      18    99                                      2     2    19
  137      19    20    29    28                          1     1     1
  138      20    21    30    29                          1     1     1
  139      21    22    31    30                          1     1     1
  140      22    23    32    31                          1     1     1
  141      23    24    33    32                          1     1     1
  142      24    25    34    33                          1     1     1
  143      25    26    35    34                          1     1     1
  144      26    27    36    35                          1     1     1
  145      19   100                                      2     2    20
  146      20   101                                      2     2    21
  147      21   102                                      2     2    22
  148      22   103                                      2     2    23
  149      23   104                                      2     2    24
  150      24   105                                      2     2    25
           A     A     A     A     A     A     A     A     A     A     A     A     A
```

	6	12	18	24	30	36	42	48	54	60	66	72	78
	V	V	V	V	V	V	V	V	V	V	V	V	V
151	25	106							2	2	26		
152	26	107							2	2	27		
153	27	108							2	2	28		
154	28	29	38	37					1	1	1		
155	29	30	39	38					1	1	1		
156	30	31	40	39					1	1	1		
157	31	32	41	40					1	1	1		
158	32	33	42	41					1	1	1		
159	33	34	43	42					1	1	1		
160	34	35	44	43					1	1	1		
161	35	36	45	44					1	1	1		
162	28	109							2	2	29		
163	29	110							2	2	30		
164	30	111							2	2	31		
165	31	112							2	2	32		
166	32	113							2	2	33		
167	33	114							2	2	34		
168	34	115							2	2	35		
169	35	116							2	2	36		
170	36	117							2	2	37		
171	37	38	47	46					1	1	1		
172	38	39	48	47					1	1	1		
173	39	40	49	48					1	1	1		
174	40	41	50	49					1	1	1		
175	41	42	51	50					1	1	1		
176	42	43	52	51					1	1	1		
177	43	44	53	52					1	1	1		
178	44	45	54	53					1	1	1		
179	37	118							2	2	38		
180	38	119							2	2	39		
181	39	120							2	2	40		
182	40	121							2	2	41		
183	41	122							2	2	42		
184	42	123							2	2	43		
185	43	124							2	2	44		
186	44	125							2	2	45		
187	45	126							2	2	46		
188	46	47	56	55					1	1	1		
189	47	48	57	56					1	1	1		
190	48	49	58	57					1	1	1		
191	49	50	59	58					1	1	1		
192	50	51	60	59					1	1	1		
193	51	52	61	60					1	1	1		
194	52	53	62	61					1	1	1		
195	53	54	63	62					1	1	1		
196	46	127							2	2	47		
197	47	128							2	2	48		
198	48	129							2	2	49		
199	49	130							2	2	50		
200	50	131							2	2	51		
	A	A	A	A	A	A	A	A	A	A	A	A	A

**********ANSYS INPUT DATA LISTING (TAPE18) **********

	6	12	18	24	30	36	42	48	54	60	66	72	78
	V	V	V	V	V	V	V	V	V	V	V	V	V
201	51	132							2	2	52		
202	52	133							2	2	53		
203	53	134							2	2	54		
204	54	135							2	2	55		
205	55	56	65	64					1	1	1		
206	56	57	66	65					1	1	1		
207	57	58	67	66					1	1	1		
208	58	59	68	67					1	1	1		
209	59	60	69	68					1	1	1		
210	60	61	70	69					1	1	1		
211	61	62	71	70					1	1	1		
212	62	63	72	71					1	1	1		
213	55	136							2	2	56		
214	56	137							2	2	57		
215	57	138							2	2	58		
216	58	139							2	2	59		
217	59	140							2	2	60		
218	60	141							2	2	61		
219	61	142							2	2	62		
220	62	143							2	2	63		
221	63	144							2	2	64		
222	64	65	74	73					1	1	1		
223	65	66	75	74					1	1	1		
224	66	67	76	75					1	1	1		
225	67	68	77	76					1	1	1		
226	68	69	78	77					1	1	1		
227	69	70	79	78					1	1	1		
228	70	71	80	79					1	1	1		
229	71	72	81	80					1	1	1		
230	64	145							2	2	65		
231	65	146							2	2	66		
232	66	147							2	2	67		
233	67	148							2	2	68		
234	68	149							2	2	69		
235	69	150							2	2	70		
236	70	151							2	2	71		
237	71	152							2	2	72		
238	72	153							2	2	73		
239	73	154							2	2	74		
240	74	155							2	2	75		
241	75	156							2	2	76		
242	76	157							2	2	77		
243	77	158							2	2	78		
244	78	159							2	2	79		
245	79	160							2	2	80		
246	80	161							2	2	81		
247	81	162							2	2	82		
248	11	92							3	3	83		
249	17	98							3	3	84		
250	65	104							3	3	85		
	A	A	A	A	A	A	A	A	A	A	A	A	A

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          **********--ANSYS INPUT DATA LISTING (TAPE16) **********

                 6    12    18    24    30    36    42    48    54    60    66    72    78
                 V     V     V     V     V     V     V     V     V     V     V     V     V
   251          71   152                                                 3     3    86
   252          31    32   194   193                                    0     0    87
   253          32    33   195   194                                    0     0    87
   254          33    42   204   195                                    0     0    88
   255          42    51   213   204                                    0     0    88
   256          31    40   202   193                                    0     0    89
   257          40    49   211   202                                    0     0    89
   258          49    50   212   211                                    0     0    90
   259          50    51   213   212                                    0     0    90
   260         193   194   275   274                                    0     0    87
   261         275   276                                                5     5    91
   262         194   195   276   275                                    0     0    87
   263         276   275                                                5     5    91
   264         195   204   285   276                                    0     0    88
   265         285   274                                                5     5    91
   266         204   213   294   285                                    0     0    88
   267         294   285                                                5     5    91
   268         193   202   283   274                                    0     0    89
   269         283   274                                                5     5    91
   270         202   211   292   283                                    0     0    89
   271         292   283                                                5     5    91
   272         211   212   293   292                                    0     0    90
   273         293   292                                                5     5    91
   274         212   213   294   293                                    0     0    90
   275         294   293                                                5     5    91
   276         293  1601                                                5     5    91
   277          -1
   278           1        0.          0.          0.
   279           2          .1250E+01 0.          0.
   280           3          .2375E+01 0.          0.
   281           4          .3500E+01 0.          0.
   282           5          .5000E+01 0.          0.
   283           6          .6500E+01 0.          0.
   284           7          .7625E+01 0.          0.
   285           8          .8750E+01 0.          0.
   286           9          .1000E+02 0.          0.
   287          10        0.          .1250E+01   0.
   288          11          .1250E+01 .1250E+01   0.
   289          12          .2375E+01 .1250E+01   0.
   290          13          .3500E+01 .1250E+01   0.
   291          14          .5000E+01 .1250E+01   0.
   292          15          .6500E+01 .1250E+01   0.
   293          16          .7625E+01 .1250E+01   0.
   294          17          .8750E+01 .1250E+01   0.
   295          18          .1000E+02 .1250E+01   0.
   296          19        0.          .2375E+01   0.
   297          20          .1250E+01 .2375E+01   0.
   298          21          .2375E+01 .2375E+01   0.
   299          22          .3500E+01 .2375E+01   0.
   300          23          .5000E+01 .2375E+01   0.
                 A     A     A     A     A     A     A     A     A     A     A     A     A
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********** ANSYS INPUT DATA LISTING (TAPE18) **********

```
     6    12    18    24    30    36    42    48    54    60    66    72    78
     V     V     V     V     V     V     V     V     V     V     V     V     V
301  28          .6500E+01   .2375E+01  0.
302  25          .7625E+01   .2375E+01  0.
303  26          .8750E+01   .2375E+01  0.
304  27          .1000E+02   .2375E+01  0.
305  28       0.             .3500E+01  0.
306  29          .1250E+01   .3500E+01  0.
307  30          .2375E+01   .3500E+01  0.
308  31          .3500E+01   .3500E+01  0.
309  32          .5000E+01   .3500E+01  0.
310  33          .6500E+01   .3500E+01  0.
311  34          .7625E+01   .3500E+01  0.
312  35          .8750E+01   .3500E+01  0.
313  36          .1000E+02   .3500E+01  0.
314  37       0.             .5000E+01  0.
315  38          .1250E+01   .5000E+01  0.
316  39          .2375E+01   .5000E+01  0.
317  40          .3500E+01   .5000E+01  0.
318  41          .5000E+01   .5000E+01  0.
319  42          .6500E+01   .5000E+01  0.
320  43          .7625E+01   .5000E+01  0.
321  44          .8750E+01   .5000E+01  0.
322  45          .1000E+02   .5000E+01  0.
323  46       0.             .6500E+01  0.
324  47          .1250E+01   .6500E+01  0.
325  48          .2375E+01   .6500E+01  0.
326  49          .3500E+01   .6500E+01  0.
327  50          .5000E+01   .6500E+01  0.
328  51          .6500E+01   .6500E+01  0.
329  52          .7625E+01   .6500E+01  0.
330  53          .8750E+01   .6500E+01  0.
331  54          .1000E+02   .6500E+01  0.
332  55       0.             .7625E+01  0.
333  56          .1250E+01   .7625E+01  0.
334  57          .2375E+01   .7625E+01  0.
335  58          .3500E+01   .7625E+01  0.
336  59          .5000E+01   .7625E+01  0.
337  60          .6500E+01   .7625E+01  0.
338  61          .7625E+01   .7625E+01  0.
339  62          .8750E+01   .7625E+01  0.
340  63          .1000E+02   .7625E+01  0.
341  64       0.             .8750E+01  0.
342  65          .1250E+01   .8750E+01  0.
343  66          .2375E+01   .8750E+01  0.
344  67          .3500E+01   .8750E+01  0.
345  68          .5000E+01   .8750E+01  0.
346  69          .6500E+01   .8750E+01  0.
347  70          .7625E+01   .8750E+01  0.
348  71          .8750E+01   .8750E+01  0.
349  72          .1000E+02   .8750E+01  0.
350  73       0.             .1000E+02  0.
     A     A     A     A     A     A     A     A     A     A     A     A     A
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**********ANSYS INPUT DATA LISTING (TAPE18)**********

          6     12     18     24     30     36     42     48     54     60     66     72     78
          V      V      V      V      V      V      V      V      V      V      V      V      V
  351     74          .1250E+01    .1000E+02  0.
  352     75          .2375E+01    .1000E+02  0.
  353     76          .3500E+01    .1000E+02  0.
  354     77          .5000E+01    .1000E+02  0.
  355     78          .6500E+01    .1000E+02  0.
  356     79          .7625E+01    .1000E+02  0.
  357     80          .8750E+01    .1000E+02  0.
  358     81          .1000E+02    .1000E+02  0.
  359     82     0.                0.         -.1000E+01
  360     83          .1250E+01    0.         -.1000E+01
  361     84          .2375E+01    0.         -.1000E+01
  362     85          .3500E+01    0.         -.1000E+01
  363     86          .5000E+01    0.         -.1000E+01
  364     87          .6500E+01    0.         -.1000E+01
  365     88          .7625E+01    0.         -.1000E+01
  366     89          .8750E+01    0.         -.1000E+01
  367     90          .1000E+02    0.         -.1000E+01
  368     91     0.                .1250E+01  -.1000E+01
  369     92          .1250E+01    .1250E+01  -.1000E+01
  370     93          .2375E+01    .1250E+01  -.1000E+01
  371     94          .3500E+01    .1250E+01  -.1000E+01
  372     95          .5000E+01    .1250E+01  -.1000E+01
  373     96          .6500E+01    .1250E+01  -.1000E+01
  374     97          .7625E+01    .1250E+01  -.1000E+01
  375     98          .8750E+01    .1250E+01  -.1000E+01
  376     99          .1000E+02    .1250E+01  -.1000E+01
  377    100     0.                .2375E+01  -.1000E+01
  378    101          .1250E+01    .2375E+01  -.1000E+01
  379    102          .2375E+01    .2375E+01  -.1000E+01
  380    103          .3500E+01    .2375E+01  -.1000E+01
  381    104          .5000E+01    .2375E+01  -.1000E+01
  382    105          .6500E+01    .2375E+01  -.1000E+01
  383    106          .7625E+01    .2375E+01  -.1000E+01
  384    107          .8750E+01    .2375E+01  -.1000E+01
  385    108          .1000E+02    .2375E+01  -.1000E+01
  386    109     0.                .3500E+01  -.1000E+01
  387    110          .1250E+01    .3500E+01  -.1000E+01
  388    111          .2375E+01    .3500E+01  -.1000E+01
  389    112          .3500E+01    .3500E+01  -.1000E+01
  390    113          .5000E+01    .3500E+01  -.1000E+01
  391    114          .6500E+01    .3500E+01  -.1000E+01
  392    115          .7625E+01    .3500E+01  -.1000E+01
  393    116          .8750E+01    .3500E+01  -.1000E+01
  394    117          .1000E+02    .3500E+01  -.1000E+01
  395    118     0.                .5000E+01  -.1000E+01
  396    119          .1250E+01    .5000E+01  -.1000E+01
  397    120          .2375E+01    .5000E+01  -.1000E+01
  398    121          .3500E+01    .5000E+01  -.1000E+01
  399    122          .5000E+01    .5000E+01  -.1000E+01
  400    123          .6500E+01    .5000E+01  -.1000E+01
          A      A      A      A      A      A      A      A      A      A      A      A      A
```

********** ANSYS INPUT DATA LISTING (TAPE18) **********

	6	12	18	24	30	36	42	48	54	60	66	72	78
	V	V	V	V	V	V	V	V	V	V	V	V	V
001	128		.7625E+01		.5000E+01		-.1000E+01						
002	125		.8750E+01		.5000E+01		-.1000E+01						
003	126		.1000E+02		.5000E+01		-.1000E+01						
004	127		0.		.6500E+01		-.1000E+01						
005	128		.1250E+01		.6500E+01		-.1000E+01						
006	129		.2375E+01		.6500E+01		-.1000E+01						
007	130		.3500E+01		.6500E+01		-.1000E+01						
008	131		.5000E+01		.6500E+01		-.1000E+01						
009	132		.6500E+01		.6500E+01		-.1000E+01						
010	133		.7625E+01		.6500E+01		-.1000E+01						
011	134		.8750E+01		.6500E+01		-.1000E+01						
012	135		.1000E+02		.6500E+01		-.1000E+01						
013	136		0.		.7625E+01		-.1000E+01						
014	137		.1250E+01		.7625E+01		-.1000E+01						
015	138		.2375E+01		.7625E+01		-.1000E+01						
016	139		.3500E+01		.7625E+01		-.1000E+01						
017	140		.5000E+01		.7625E+01		-.1000E+01						
018	141		.6500E+01		.7625E+01		-.1000E+01						
019	142		.7625E+01		.7625E+01		-.1000E+01						
020	143		.8750E+01		.7625E+01		-.1000E+01						
021	144		.1000E+02		.7625E+01		-.1000E+01						
022	145		0.		.8750E+01		-.1000E+01						
023	146		.1250E+01		.8750E+01		-.1000E+01						
024	147		.2375E+01		.8750E+01		-.1000E+01						
025	148		.3500E+01		.8750E+01		-.1000E+01						
026	149		.5000E+01		.8750E+01		-.1000E+01						
027	150		.6500E+01		.8750E+01		-.1000E+01						
028	151		.7625E+01		.8750E+01		-.1000E+01						
029	152		.8750E+01		.8750E+01		-.1000E+01						
030	153		.1000E+02		.8750E+01		-.1000E+01						
031	154		0.		.1000E+02		-.1000E+01						
032	155		.1250E+01		.1000E+02		-.1000E+01						
033	156		.2375E+01		.1000E+02		-.1000E+01						
034	157		.3500E+01		.1000E+02		-.1000E+01						
035	158		.5000E+01		.1000E+02		-.1000E+01						
036	159		.6500E+01		.1000E+02		-.1000E+01						
037	160		.7625E+01		.1000E+02		-.1000E+01						
038	161		.8750E+01		.1000E+02		-.1000E+01						
039	162		.1000E+02		.1000E+02		-.1000E+01						
040	193		.3500E+01		.3500E+01		.1500E+01						
041	194		.5000E+01		.3500E+01		.1500E+01						
042	195		.6500E+01		.3500E+01		.1500E+01						
043	200		.6500E+01		.5000E+01		.1500E+01						
044	213		.6500E+01		.6500E+01		.1500E+01						
045	202		.3500E+01		.5000E+01		.1500E+01						
046	211		.3500E+01		.6500E+01		.1500E+01						
047	212		.5000E+01		.6500E+01		.1500E+01						
048	274		.3500E+01		.3500E+01		.3000E+01						
049	275		.5000E+01		.3500E+01		.3000E+01						
050	276		.6500E+01		.3500E+01		.3000E+01						
	A	A	A	A	A	A	A	A	A	A	A	A	A

```
********** ANSYS INPUT DATA LISTING (TAPE(A) **********

                6    12    18    24    30    36    42    48    54    60    66    72    78
                V     V     V     V     V     V     V     V     V     V     V     V     V
  451         285          .6500E+01   .5000E+01   .3000E+01
  452         294          .6500E+01   .6500E+01   .3000E+01
  453         283          .3500E+01   .5000E+01   .3000E+01
  454         292          .3500E+01   .6500E+01   .3000E+01
  455         293          .5000E+01   .6500E+01   .3000E+01
  456        1601          .5000E+01   .5000E+01   .3000E+01
  457          -1
  458   EX       1          .2900E+05
  459   EY       1          .2900E+05
  460   NUXY     1          .3000E+00
  461   ALPX     1       0.
  462   ALPY     1       0.
  463   DENS     1       0.
  464   EX       2          .5777E+03
  465   ALPX     2       0.
  466   DENS     2       0.
  467   EX       3          .2900E+05
  468   ALPY     3       0.
  469   DENS     3       0.
  470   EX       4          .2900E+05
  471   EY       4          .2900E+05
  472   NUXY     4          .3000E+00
  473   ALPX     4       0.
  474   ALPY     4       0.
  475   DENS     4       0.
  476   EX       5          .2900E+05
  477   ALPX     5       0.
  478   NUXY     5          .3000E+00
  479   DENS     5       0.
  480   END
  481     1   -10 10
  482
  483                                                  1
  484         1 UX      0.                    81       UY
  485        82 UX      0.                   162       UY    UZ
  486           END
  487    1601 FZ          .6800E+01
  488           -1
  489        -1
  490   FINISH
```

BASEPLATE TEST RUN---TELEDYNE TEST LOAD NO.2

SAMPLE PROBLEM NO. 2

****BASE PLATE BOLT LOCATIONS****

NO. OF BOLTS IN X-DIR	NO. OF BOLTS IN Y-DIR	X-DIRECTION Y-DIMENSION	
4	4	10.00	10.00

X-COORD.=	0.0	1.250	2.375	3.500	5.000	6.500	7.625	8.750	10.000
Y-COORD.=	0.0	1.250	2.375	3.500	5.000	6.500	7.625	8.750	10.000

****MATERIAL PROPERTIES****

PL TO PLATE	E OF PLATE	E OF BOLT	E OF CONCRETE	NU STEEL	NU OF CONCRETE
.35	29000000.	29000000.	5145.00	.30	.26

****BOLT SPRING CONSTANT AT EACH BOLT****

235.0	446.6	423.1	423.6	564.1	423.6	423.1	446.6	235.0
44.4	140.3	866.8	937.8	1071.7	937.8	803.8	943.5	446.6
42.1	1.5.8	761.5	803.8	1.13.3	943.9	761.8	803.8	423.1
423.6	937.8	803.8	1.36.5	1184.5	1.36.5	803.8	937.8	423.6
56.1	1071.7	1131.3	1184.5	1353.8	1184.5	1135.3	1071.7	564.1
45.6	937.8	1.3.4	1.36.5	1184.5	1136.5	803.8	937.8	423.6
42.1	803.8	761.5	803.8	1015.3	803.8	761.5	803.8	423.1
446.6	84.5	843.8	937.8	1071.7	937.5	803.8	943.5	446.6
235.0	446.6	423.1	423.6	564.1	423.6	423.1	446.6	235.0

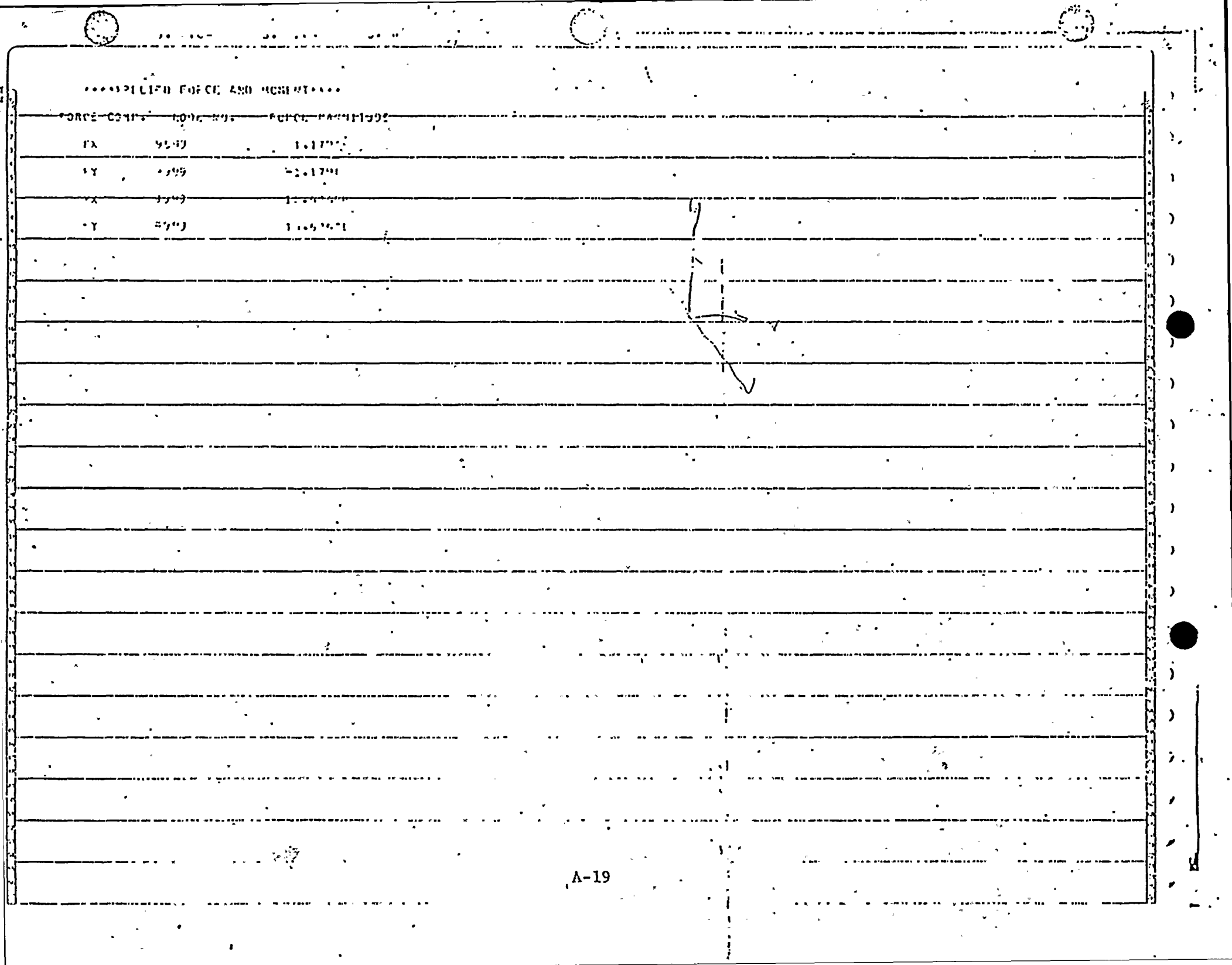
****SPRING CONSTANTS****

SUM OF BOLT SPRING	BOLT SPRING			
63167.5	273.7	273.8	273.8	273.8
	96.3	96.3	96.3	96.3

****BOLT LOCATION****

X-COORD.=	1.25	3.75	6.25	8.75
Y-COORD.=	1.25	3.75	6.25	8.75

****AREA CENTER OF ATTACHMENT****



********** ANSYS INPUT DATA LISTING (TAPE18) **********

```
                6    12    18    24    30    36    42    48    54    60    66    72    78
                V     V     V     V     V     V     V     V     V     V     V     V     V
  1  BASEPLATE TEST RUN---TELEDYNE TEST LOAD NO. 2
  2  S-J CHEN
  3                 1           99          1
  4                                                       0
  5    1 63 00  0
  6    2 10 11  0
  7    3 10 10  0
  8    4 63 00  0
  9    5  4 00  0
 10    6 14
 11    1
 12   .3750E+00
 13   .3906E+00
 14   .7422E+00
 15   .7031E+00
 16   .8203E+00
 17   .9375E+00
 18   .8203E+00
 19   .7031E+00
 20   .7422E+00
 21   .3906E+00
 22   .7422E+00
 23   .1410E+01
 24   .1336E+01
 25   .1559E+01
 26   .1781E+01
 27   .1559E+01
 28   .1336E+01
 29   .1410E+01
 30   .7422E+00
 31   .7031E+00
 32   .1336E+01
 33   .1266E+01
 34   .1477E+01
 35   .1688E+01
 36   .1477E+01
 37   .1266E+01
 38   .1336E+01
 39   .7031E+00
 40   .8203E+00
 41   .1559E+01
 42   .1477E+01
 43   .1723E+01
 44   .1969E+01
 45   .1723E+01
 46   .1477E+01
 47   .1559E+01
 48   .8203E+00
 49   .9375E+00
 50   .1781E+01
        A     A     A     A     A     A     A     A     A     A     A     A     A
```

********** ANSYS INPUT DATA LISTING (TAPE13) **********

```
                6    12    18    21    30    36    42    48    54    60    66    72    78
                V     V     V     V     V     V     V     V     V     V     V     V     V
      51   .1688E+01
      52   .1969E+01
      53   .2250E+01
      54   .1969E+01
      55   .1688E+01
      56   .1781E+01
      57   .9375E+00
      58   .5203E+00
      59   .1559E+01
      60   .1477E+01
      61   .1723E+01
      62   .1969E+01
      63   .1723E+01
      64   .1477E+01
      65   .1559E+01
      66   .8203E+00
      67   .7031E+00
      68   .1336E+01
      69   .1266E+01
      70   .1477E+01
      71   .1688E+01
      72   .1477E+01
      73   .1266E+01
      74   .1336E+01
      75   .7031E+00
      76   .7422E+00
      77   .1410E+01
      78   .1336E+01
      79   .1559E+01
      80   .1781E+01
      81   .1559E+01
      82   .1336E+01
      83   .1410E+01
      84   .7422E+00
      85   .3906E+00
      86   .7422E+00
      87   .7031E+00
      88   .8203E+00
      89   .9375E+00
      90   .8203E+00
      91   .7031E+00
      92   .7422E+00
      93   .3906E+00
      94   .9689E+02
      95   .9414E-02
      96   .9689E+02
      97   .9414E-02
      98   .9689E+02
      99   .9414E-02
     100   .9689E+02
                A     A     A     A     A     A     A     A     A     A     A     A     A
```

********** ANSYS INPUT DATA LISTING (TAPE18) **********

```
                6     12    18    24    30    36    42    48    54    60    66    72    78
                V     V     V     V     V     V     V     V     V     V     V     V     V
     101    .9414E-02
     102    .2500E+00
     103    .2500E+00
     104    .2500E+00
     105    .2500E+00
     106    .1000E+03 .1000E+06 .1000E+06 .1000E+01 .1000E+01
     107         -1
     108       1     2    11    11                          1     1     1
     109       2     3    12    11                          1     1     1
     110       3     4    13    12                          1     1     1
     111       4     5    14    13                          1     1     1
     112       5     6    15    14                          1     1     1
     113       6     7    16    15                          1     1     1
     114       7     8    17    16                          1     1     1
     115       8     9    18    17                          1     1     1
     116       1    82                                      2     2     2
     117       2    83                                      2     2     3
     118       3    84                                      2     2     4
     119       4    85                                      2     2     5
     120       5    86                                      2     2     6
     121       6    87                                      2     2     7
     122       7    88                                      2     2     8
     123       8    89                                      2     2     9
     124       9    90                                      2     2    10
     125      10    11    20    19                          1     1     1
     126      11    12    21    20                          1     1     1
     127      12    13    22    21                          1     1     1
     128      13    14    23    22                          1     1     1
     129      14    15    24    23                          1     1     1
     130      15    16    25    24                          1     1     1
     131      16    17    26    25                          1     1     1
     132      17    18    27    26                          1     1     1
     133      10    91                                      2     2    11
     134      11    92                                      2     2    12
     135      12    93                                      2     2    13
     136      13    94                                      2     2    14
     137      14    95                                      2     2    15
     138      15    96                                      2     2    16
     139      16    97                                      2     2    17
     140      17    98                                      2     2    18
     141      18    99                                      2     2    19
     142      19    20    29    28                          1     1     1
     143      20    21    30    29                          1     1     1
     144      21    22    31    30                          1     1     1
     145      22    23    32    31                          1     1     1
     146      23    24    33    32                          1     1     1
     147      24    25    34    33                          1     1     1
     148      25    26    35    34                          1     1     1
     149      26    27    36    35                          1     1     1
     150      19   100                                      2     2    20
                A     A     A     A     A     A     A     A     A     A     A     A     A
```

********** ANSYS INPUT DATA LISTING (TAPE18) *********

	6	12	18	24	30	36	42	48	54	60	66	72	78
	V	V	V	V	V	V	V	V	V	V	V	V	V
151	20	101							2	2	21		
152	21	102							2	2	22		
153	22	103							2	2	23		
154	23	104							2	2	24		
155	24	105							2	2	25		
156	25	106							2	2	26		
157	26	107							2	2	27		
158	27	108							2	2	28		
159	28	29	38	37					1	1	1		
160	29	30	39	38					1	1	1		
161	30	31	40	39					1	1	1		
162	31	32	41	40					1	1	1		
163	32	33	42	41					1	1	1		
164	33	34	43	42					1	1	1		
165	34	35	44	43					1	1	1		
166	35	36	45	44					1	1	1		
167	28	109							2	2	29		
168	29	110							2	2	30		
169	30	111							2	2	31		
170	31	112							2	2	32		
171	32	113							2	2	33		
172	33	114							2	2	34		
173	34	115							2	2	35		
174	35	116							2	2	36		
175	36	117							2	2	37		
176	37	38	47	46					1	1	1		
177	38	39	48	47					1	1	1		
178	39	40	49	48					1	1	1		
179	40	41	50	49					1	1	1		
180	41	42	51	50					1	1	1		
181	42	43	52	51					1	1	1		
182	43	44	53	52					1	1	1		
183	44	45	54	53					1	1	1		
184	37	118							2	2	38		
185	38	119							2	2	39		
186	39	120							2	2	40		
187	40	121							2	2	41		
188	41	122							2	2	42		
189	42	123							2	2	43		
190	43	124							2	2	44		
191	44	125							2	2	45		
192	45	126							2	2	46		
193	46	47	56	55					1	1	1		
194	47	48	57	56					1	1	1		
195	48	49	58	57					1	1	1		
196	49	50	59	58					1	1	1		
197	50	51	60	59					1	1	1		
198	51	52	61	60					1	1	1		
199	52	53	62	61					1	1	1		
200	53	54	63	62					1	1	1		
	A	A	A	A	A	A	A	A	A	A	A	A	A

********** ANSYS INPUT DATA LISTING (TAPE13) **********

	6	12	18	24	30	36	42	48	54	60	66	72	78
	V	V	V	V	V	V	V	V	V	V	V	V	V
201	46	127							2	2	47		
202	47	128							2	2	48		
203	48	129							2	2	49		
204	49	130							2	2	50		
205	50	131							2	2	51		
206	51	132							2	2	52		
207	52	133							2	2	53		
208	53	134							2	2	54		
209	54	135							2	2	55		
210	55	56	65	64					1	1	1		
211	56	57	66	65					1	1	1		
212	57	58	67	66					1	1	1		
213	58	59	68	67					1	1	1		
214	59	60	69	68					1	1	1		
215	60	61	70	69					1	1	1		
216	61	62	71	70					1	1	1		
217	62	63	72	71					1	1	1		
218	55	136							2	2	56		
219	56	137							2	2	57		
220	57	138							2	2	58		
221	58	139							2	2	59		
222	59	140							2	2	60		
223	60	141							2	2	61		
224	61	142							2	2	62		
225	62	143							2	2	63		
226	63	144							2	2	64		
227	64	65	74	73					1	1	1		
228	65	66	75	74					1	1	1		
229	66	67	76	75					1	1	1		
230	67	68	77	76					1	1	1		
231	68	69	78	77					1	1	1		
232	69	70	79	78					1	1	1		
233	70	71	80	79					1	1	1		
234	71	72	81	80					1	1	1		
235	64	145							2	2	65		
236	65	146							2	2	66		
237	66	147							2	2	67		
238	67	148							2	2	68		
239	68	149							2	2	69		
240	69	150							2	2	70		
241	70	151							2	2	71		
242	71	152							2	2	72		
243	72	153							2	2	73		
244	73	154							2	2	74		
245	74	155							2	2	75		
246	75	156							2	2	76		
247	76	157							2	2	77		
248	77	158							2	2	78		
249	78	159							2	2	79		
250	79	160							2	2	80		
	A	A	A	A	A	A	A	A	A	A	A	A	A

```
                6      12      18      24      30      36      42      48      54      60      66      72      78
                V       V       V       V       V       V       V       V       V       V       V       V       V
  251          80     161                                                     2       2      81
  252          81     162                                                     2       2      82
  253          11     173                                                     0       6      83
  254          11     254                                                     0       6      83
  255          11      92                                                     3       3      84
  256          17     179                                                     0       6      85
  257          17     260                                                     0       6      85
  258          17      98                                                     3       3      86
  259          55     227                                                     0       6      87
  260          55     308                                                     0       6      87
  261          65     146                                                     3       3      88
  262          71     233                                                     0       6      89
  263          71     314                                                     0       6      89
  264          71     152                                                     3       3      90
  265          31      32     194     193                                     4       4      91
  266          32      33     195     194                                     4       4      91
  267          33      42     204     195                                     4       4      92
  268          42      51     213     204                                     4       4      92
  269          31      40     202     193                                     4       4      93
  270          40      49     211     202                                     4       4      93
  271          49      50     212     211                                     4       4      94
  272          50      51     213     212                                     4       4      94
  273         193     194     275     274                                     4       4      91
  274         275     274                                                     5       5      95
  275         194     195     276     275                                     4       4      91
  276         276     275                                                     5       5      95
  277         195     204     285     276                                     4       4      92
  278         285     276                                                     5       5      95
  279         204     213     294     285                                     4       4      92
  280         294     285                                                     5       5      95
  281         193     202     283     274                                     4       4      93
  282         283     274                                                     5       5      95
  283         292     211     292     283                                     4       4      93
  284         292     283                                                     5       5      95
  285         211     212     293     292                                     4       4      94
  286         293     292                                                     5       5      95
  287         212     213     294     293                                     4       4      94
  288         294     293                                                     5       5      95
  289         293    1601                                                     5       5      95
  290          -1
  291           1          0.          0.          0.
  292           2          .1250E+01   0.          0.
  293           3          .2375E+01   0.          0.
  294           4          .3500E+01   0.          0.
  295           5          .5000E+01   0.          0.
  296           6          .6500E+01   0.          0.
  297           7          .7625E+01   0.          0.
  298           8          .8750E+01   0.          0.
  299           9          .1000E+02   0.          0.
  300          10          0.                      .1250E+01   0.
                A       A       A       A       A       A       A       A       A       A       A       A       A
```

********** ANSYS INPUT DATA LISTING (TAPE18) **********

```
                6   12   18   24   30   36   42   48   54   60   66   72   78
                V    V    V    V    V    V    V    V    V    V    V    V    V
  301   11              .1250E+01    .1250E+01   0.
  302   12              .2375E+01    .1250E+01   0.
  303   13              .3500E+01    .1250E+01   0.
  304   14              .5000E+01    .1250E+01   0.
  305   15              .6500E+01    .1250E+01   0.
  306   16              .7625E+01    .1250E+01   0.
  307   17              .8750E+01    .1250E+01   0.
  308   18              .1000E+02    .1250E+01   0.
  309   19         0.                .2375E+01   0.
  310   20              .1250E+01    .2375E+01   0.
  311   21              .2375E+01    .2375E+01   0.
  312   22              .3500E+01    .2375E+01   0.
  313   23              .5000E+01    .2375E+01   0.
  314   24              .6500E+01    .2375E+01   0.
  315   25              .7625E+01    .2375E+01   0.
  316   26              .8750E+01    .2375E+01   0.
  317   27              .1000E+02    .2375E+01   0.
  318   28         0.                .3500E+01   0.
  319   29              .1250E+01    .3500E+01   0.
  320   30              .2375E+01    .3500E+01   0.
  321   31              .3500E+01    .3500E+01   0.
  322   32              .5000E+01    .3500E+01   0.
  323   33              .6500E+01    .3500E+01   0.
  324   34              .7625E+01    .3500E+01   0.
  325   35              .8750E+01    .3500E+01   0.
  326   36              .1000E+02    .3500E+01   0.
  327   37         0.                .5000E+01   0.
  328   38              .1250E+01    .5000E+01   0.
  329   39              .2375E+01    .5000E+01   0.
  330   40              .3500E+01    .5000E+01   0.
  331   41              .5000E+01    .5000E+01   0.
  332   42              .6500E+01    .5000E+01   0.
  333   43              .7625E+01    .5000E+01   0.
  334   44              .8750E+01    .5000E+01   0.
  335   45              .1000E+02    .5000E+01   0.
  336   46         0.                .6500E+01   0.
  337   47              .1250E+01    .6500E+01   0.
  338   48              .2375E+01    .6500E+01   0.
  339   49              .3500E+01    .6500E+01   0.
  340   50              .5000E+01    .6500E+01   0.
  341   51              .6500E+01    .6500E+01   0.
  342   52              .7625E+01    .6500E+01   0.
  343   53              .8750E+01    .6500E+01   0.
  344   54              .1000E+02    .6500E+01   0.
  345   55         0.                .7625E+01   0.
  346   56              .1250E+01    .7625E+01   0.
  347   57              .2375E+01    .7625E+01   0.
  348   58              .3500E+01    .7625E+01   0.
  349   59              .5000E+01    .7625E+01   0.
  350   60              .6500E+01    .7625E+01   0.
                A    A    A    A    A    A    A    A    A    A    A    A    A
```

	6 12 18 24 30 36 42 48 54 60 66 72 78					
	V V V V V V V V V V V V V					
351	61	.7625E+01	.7625E+01	0.		
352	62	.8750E+01	.7625E+01	0.		
353	63	.1000E+02	.7625E+01	0.		
354	64	0.	.8750E+01	0.		
355	65	.1250E+01	.8750E+01	0.		
356	66	.2375E+01	.8750E+01	0.		
357	67	.3500E+01	.8750E+01	0.		
358	68	.5000E+01	.8750E+01	0.		
359	69	.6500E+01	.8750E+01	0.		
360	70	.7625E+01	.8750E+01	0.		
361	71	.8750E+01	.8750E+01	0.		
362	72	.1000E+02	.8750E+01	0.		
363	73	0.	.1000E+02	0.		
364	74	.1250E+01	.1000E+02	0.		
365	75	.2375E+01	.1000E+02	0.		
366	76	.3500E+01	.1000E+02	0.		
367	77	.5000E+01	.1000E+02	0.		
368	78	.6500E+01	.1000E+02	0.		
369	79	.7625E+01	.1000E+02	0.		
370	80	.8750E+01	.1000E+02	0.		
371	81	.1000E+02	.1000E+02	0.		
372	82	0.	0.	-.1000E+01		
373	83	.1250E+01	0.	-.1000E+01		
374	84	.2375E+01	0.	-.1000E+01		
375	85	.3500E+01	0.	-.1000E+01		
376	86	.5000E+01	0.	-.1000E+01		
377	87	.6500E+01	0.	-.1000E+01		
378	88	.7625E+01	0.	-.1000E+01		
379	89	.8750E+01	0.	-.1000E+01		
380	90	.1000E+02	0.	-.1000E+01		
381	91	0.	.1250E+01	-.1000E+01		
382	92	.1250E+01	.1250E+01	-.1000E+01		
383	93	.2375E+01	.1250E+01	-.1000E+01		
384	94	.3500E+01	.1250E+01	-.1000E+01		
385	95	.5000E+01	.1250E+01	-.1000E+01		
386	96	.6500E+01	.1250E+01	-.1000E+01		
387	97	.7625E+01	.1250E+01	-.1000E+01		
388	98	.8750E+01	.1250E+01	-.1000E+01		
389	99	.1000E+02	.1250E+01	-.1000E+01		
390	100	0.	.2375E+01	-.1000E+01		
391	101	.1250E+01	.2375E+01	-.1000E+01		
392	102	.2375E+01	.2375E+01	-.1000E+01		
393	103	.3500E+01	.2375E+01	-.1000E+01		
394	104	.5000E+01	.2375E+01	-.1000E+01		
395	105	.6500E+01	.2375E+01	-.1000E+01		
396	106	.7625E+01	.2375E+01	-.1000E+01		
397	107	.8750E+01	.2375E+01	-.1000E+01		
398	108	.1000E+02	.2375E+01	-.1000E+01		
399	109	0.	.3500E+01	-.1000E+01		
400	110	.1250E+01	.3500E+01	-.1000E+01		
	A A A A A A A A A A A A A					

********** ANSYS INPUT DATA LISTING (TAPE13) **********

```
                    6    12    18    24    30    36    42    48    54    60    66    72    78
                    V     V     V     V     V     V     V     V     V     V     V     V     V
      401       111          .2375E+01          .3500E+01         -.1000E+01
      402       112          .3500E+01          .3500E+01         -.1000E+01
      403       113          .5000E+01          .3500E+01         -.1000E+01
      404       114          .6500E+01          .3500E+01         -.1000E+01
      405       115          .7625E+01          .3500E+01         -.1000E+01
      406       116          .8750E+01          .3500E+01         -.1000E+01
      407       117          .1000E+02          .3500E+01         -.1000E+01
      408       118          0.                 .5000E+01         -.1000E+01
      409       119          .1250E+01          .5000E+01         -.1000E+01
      410       120          .2375E+01          .5000E+01         -.1000E+01
      411       121          .3500E+01          .5000E+01         -.1000E+01
      412       122          .5000E+01          .5000E+01         -.1000E+01
      413       123          .6500E+01          .5000E+01         -.1000E+01
      414       124          .7625E+01          .5000E+01         -.1000E+01
      415       125          .8750E+01          .5000E+01         -.1000E+01
      416       126          .1000E+02          .5000E+01         -.1000E+01
      417       127          0.                 .6500E+01         -.1000E+01
      418       128          .1250E+01          .6500E+01         -.1000E+01
      419       129          .2375E+01          .6500E+01         -.1000E+01
      420       130          .3500E+01          .6500E+01         -.1000E+01
      421       131          .5000E+01          .6500E+01         -.1000E+01
      422       132          .6500E+01          .6500E+01         -.1000E+01
      423       133          .7625E+01          .6500E+01         -.1000E+01
      424       134          .8750E+01          .6500E+01         -.1000E+01
      425       135          .1000E+02          .6500E+01         -.1000E+01
      426       136          0.                 .7625E+01         -.1000E+01
      427       137          .1250E+01          .7625E+01         -.1000E+01
      428       138          .2375E+01          .7625E+01         -.1000E+01
      429       139          .3500E+01          .7625E+01         -.1000E+01
      430       140          .5000E+01          .7625E+01         -.1000E+01
      431       141          .6500E+01          .7625E+01         -.1000E+01
      432       142          .7625E+01          .7625E+01         -.1000E+01
      433       143          .8750E+01          .7625E+01         -.1000E+01
      434       144          .1000E+02          .7625E+01         -.1000E+01
      435       145          0.                 .8750E+01         -.1000E+01
      436       146          .1250E+01          .8750E+01         -.1000E+01
      437       147          .2375E+01          .8750E+01         -.1000E+01
      438       148          .3500E+01          .8750E+01         -.1000E+01
      439       149          .5000E+01          .8750E+01         -.1000E+01
      440       150          .6500E+01          .8750E+01         -.1000E+01
      441       151          .7625E+01          .8750E+01         -.1000E+01
      442       152          .8750E+01          .8750E+01         -.1000E+01
      443       153          .1000E+02          .8750E+01         -.1000E+01
      444       154          0.                 .1000E+02         -.1000E+01
      445       155          .1250E+01          .1000E+02         -.1000E+01
      446       156          .2375E+01          .1000E+02         -.1000E+01
      447       157          .3500E+01          .1000E+02         -.1000E+01
      448       158          .5000E+01          .1000E+02         -.1000E+01
      449       159          .6500E+01          .1000E+02         -.1000E+01
      450       160          .7625E+01          .1000E+02         -.1000E+01
                    A     A     A     A     A     A     A     A     A     A     A     A     A
```

********** ANSYS INPUT DATA LISTING (TAPE18) **********

```
                    6    12    18    24    30    36    42    48    54    60    66    72    78
                    V     V     V     V     V     V     V     V     V     V     V     V     V
   451      161              .8750E+01    .1000E+02   -.1000E+01
   452      162              .1000E+02    .1000E+02   -.1000E+01
   453      173              .2250E+01    .1250E+01    0.
   454      254              .1250E+01    .2250E+01    0.
   455      179              .9750E+01    .1250E+01    0.
   456      260              .8750E+01    .2250E+01    0.
   457      227              .2250E+01    .8750E+01    0.
   458      308              .1250E+01    .9750E+01    0.
   459      233              .9750E+01    .8750E+01    0.
   460      314              .8750E+01    .9750E+01    0.
   461      193              .3500E+01    .3500E+01   -.1500E+01
   462      194              .5000E+01    .3500E+01    .1500E+01
   463      195              .6500E+01    .3500E+01    .1500E+01
   464      214              .6500E+01    .5000E+01    .1500E+01
   465      213              .6500E+01    .6500E+01    .1500E+01
   466      193              .3500E+01    .3500E+01    .1500E+01
   467      292              .3500E+01    .5000E+01   -.1500E+01
   468      211              .3500E+01    .6500E+01    .1500E+01
   469      212              .5000E+01    .6500E+01    .1500E+01
   470      274              .3500E+01    .3500E+01   -.3000E+01
   471      275              .5000E+01    .3500E+01    .3000E+01
   472      276              .6500E+01    .3500E+01    .3000E+01
   473      285              .6500E+01    .5000E+01   -.3000E+01
   474      294              .6500E+01    .6500E+01    .3000E+01
   475      274              .3500E+01    .3500E+01    .3000E+01
   476      283              .3500E+01    .5000E+01   -.3000E+01
   477      292              .3500E+01    .6500E+01    .3000E+01
   478      293              .5000E+01    .6500E+01    .3000E+01
   479     1601              .5000E+01    .5000E+01   -.3000E+01
   480       -1
   481  EX    1              .2900E+05
   482  EY    1              .2900E+05
   483  NUXY  1              .3000E+00
   484  ALPX  1         0.
   485  ALPY  1         0.
   486  DENS  1         0.
   487  EX    2              .6017E+03
   488  ALPX  2         0.
   489  DENS  2         0.
   490  EX    3              .2900E+05
   491  ALPX  3         0.
   492  DENS  3         0.
   493  EX    4              .2900E+05
   494  EY    4              .2900E+05
   495  NUXY  4              .3000E+00
   496  ALPX  4         0.
   497  ALPY  4         0.
   498  DENS  4         0.
   499  EX    5              .2900E+05
   500  ALPX  5         0.
                    A     A     A     A     A     A     A     A     A     A     A     A     A
```

********** ANSYS INPUL DATA LISTING (TAPE18) **********

```
                6     12    18    24    30    36    42    48    54    60    66    72    78
                V     V     V     V     V     V     V     V     V     V     V     V     V
  501   NUXY   5        .3000E+00
  502   DENS   5        0.
  503   END
  504     1   -10 10                                                              1
  505
  506                                                    1
  507       82 UX      0.                          152       UY    UZ
  508      173 UX                                   254    81 UY    UZ
  509      179 UX                                   250    81 UY    UZ
  510      227 UX                                   306    81 UY    UZ
  511      233 UX                                   314    81 UY    UZ
  512          END
  513     1601 FX      .1179E+01
  514     1601 FY      .1179E+01
  515     1601 MX      .1061E+02
  516     1601 MY      .1061E+02
  517          -1
  518       -1
  519   FINISH
```

BASEPLATE TEST PROBLEM---TELEPHONE TEST LOAD NO. 3

SAMPLE PROBLEM NO. 3

****BASE PLATE MESH INFORMATION****

NO. OF X-GRIDS	NO. OF Y-GRIDS	X-DIRECTION Y-DIMENSION	
7	7	10.000	10.000

X-COORD.=	0.000	1.250	2.375	3.500	5.000	6.500	7.625	8.750	10.000
Y-COORD.=	0.000	1.250	2.375	3.500	5.000	6.500	7.625	8.750	10.000

****MATERIAL PROPERTIES****

PLATE THK	E OF PLATE	E OF BOLT	E OF CONCRETE	NU STEEL	NU OF CONCRETE
.50	29000.00	29000.00	5100.00	.30	.16

****RC SPRING CONSTANT AT EACH NODE****

235.0	445.6	423.1	491.6	564.1	491.6	423.1	445.6	235.0
445.6	845.5	803.8	937.8	1071.7	937.8	803.8	845.5	445.6
423.1	803.8	761.5	889.4	1015.3	889.4	761.5	803.8	423.1
491.6	937.8	889.4	1036.5	1184.5	1036.5	889.4	937.8	491.6
564.1	1071.7	1015.3	1184.5	1353.0	1184.5	1015.3	1071.7	564.1
491.6	937.8	889.4	1036.5	1184.5	1036.5	889.4	937.8	491.6
423.1	803.8	761.5	889.4	1015.3	889.4	761.5	803.8	423.1
445.6	845.5	803.8	937.8	1071.7	937.8	803.8	845.5	445.6
235.0	445.6	423.1	491.6	564.1	491.6	423.1	445.6	235.0

****SPRING CONSTANTS****

SUM OF RC SPRING	BOLT SPRING			
6913.7	273.1	273.1	273.1	273.1
	96.9	96.9	96.9	96.9

****BOLT LOCATION****

X-COORD.=	1.250	3.750	1.250	3.750
Y-COORD.=	1.250	1.250	3.750	3.750

****AREA CLOSEST TO ATTACHMENT****

********** ANSYS INPUT DATA LISTING (TAPE18) **********

```
      6    12    18    24    30    36    42    48    54    60    66    72    78
      V     V     V     V     V     V     V     V     V     V     V     V     V
  1 BASEPLATE TEST RUN--- CLEOYNE TEST LOAD NO. 3
  2 S-J CHEN
  3           1                 99                1
  4                                                           0
  5  1 63 00  0
  6  2 10 11  0
  7  3 10 10  0
  8  4 63 00  0
  9  5  4 00  0
 10  6 14
 11  1
 12  .3750E+00
 13  .3906E+00
 14  .7422E+00
 15  .7031E+00
 16  .8203E+00
 17  .9375E+00
 18  .8203E+00
 19  .7031E+00
 20  .7422E+00
 21  .3906E+00
 22  .7422E+00
 23  .1410E+01
 24  .1336E+01
 25  .1559E+01
 26  .1781E+01
 27  .1559E+01
 28  .1336E+01
 29  .1410E+01
 30  .7422E+00
 31  .7031E+00
 32  .1336E+01
 33  .1266E+01
 34  .1477E+01
 35  .1688E+01
 36  .1477E+01
 37  .1266E+01
 38  .1336E+01
 39  .7031E+00
 40  .8203E+00
 41  .1559E+01
 42  .1477E+01
 43  .1723E+01
 44  .1969E+01
 45  .1723E+01
 46  .1477E+01
 47  .1559E+01
 48  .8203E+00
 49  .9375E+00
 50  .1781E+01
      A     A     A     A     A     A     A     A     A     A     A     A
```

********** ANSYS INPUT DATA LISTING (TAPE18) **********

```
                6    12    18    24    30    35    42    48    54    60    66    72    78
                V     V     V     V     V     V     V     V     V     V     V     V     V
      51   .1688E+01
      52   .1969E+01
      53   .2250E+01
      54   .1969E+01
      55   .1688E+01
      56   .1781E+01
      57   .9375E+00
      58   .8293E+00
      59   .1559E+01
      60   .1477E+01
      61   .1723E+01
      62   .1969E+01
      63   .1723E+01
      64   .1477E+01
      65   .1559E+01
      66   .8293E+00
      67   .7031E+00
      68   .1336E+01
      69   .1266E+01
      70   .1477E+01
      71   .1688E+01
      72   .1477E+01
      73   .1266E+01
      74   .1336E+01
      75   .7031E+00
      76   .7422E+00
      77   .1419E+01
      78   .1336E+01
      79   .1559E+01
      80   .1781E+01
      81   .1559E+01
      82   .1336E+01
      83   .1419E+01
      84   .7422E+00
      85   .3906E+00
      86   .7422E+00
      87   .7031E+00
      88   .8293E+00
      89   .9375E+00
      90   .8293E+00
      91   .7031E+00
      92   .7422E+00
      93   .3906E+00
      94   .9689E+02
      95   .9414E-02
      96   .9689E+02
      97   .9414E-02
      98   .9689E+02
      99   .9414E-02
     100   .9689E+02
                A     A     A     A     A     A     A     A     A     A     A     A     A
```

********** ANSYS INPUT DATA LISTING (TAPE13) **********

```
                6      12      18      24      30      36      42      48      54      60      66      72      78
                V       V       V       V       V       V       V       V       V       V       V       V       V
  101   .9414E-02
  102   .2530E+00
  103   .2530E+00
  104   .2530E+00
  105   .2530E+00
  106   .1000E+03 .1000E+06 .1000E+06 .1000E+01 .1000E+01
  107         -1
  108         1       2      11      10                              1       1       1
  109         2       3      12      11                              1       1       1
  110         3       4      13      12                              1       1       1
  111         4       5      14      13                              1       1       1
  112         5       6      15      14                              1       1       1
  113         6       7      16      15                              1       1       1
  114         7       8      17      16                              1       1       1
  115         8       9      18      17                              1       1       1
  116         1      82                                              2       2       2
  117         2      83                                              2       2       3
  118         3      84                                              2       2       4
  119         4      85                                              2       2       5
  120         5      86                                              2       2       6
  121         6      87                                              2       2       7
  122         7      88                                              2       2       8
  123         8      89                                              2       2       9
  124         9      90                                              2       2      10
  125        10      11      20      19                              1       1       1
  126        11      12      21      20                              1       1       1
  127        12      13      22      21                              1       1       1
  128        13      14      23      22                              1       1       1
  129        14      15      24      23                              1       1       1
  130        15      16      25      24                              1       1       1
  131        16      17      26      25                              1       1       1
  132        17      18      27      26                              1       1       1
  133        10      91                                              2       2      11
  134        11      92                                              2       2      12
  135        12      93                                              2       2      13
  136        13      94                                              2       2      14
  137        14      95                                              2       2      15
  138        15      96                                              2       2      16
  139        16      97                                              2       2      17
  140        17      98                                              2       2      18
  141        18      99                                              2       2      19
  142        19      20      29      28                              1       1       1
  143        20      21      30      29                              1       1       1
  144        21      22      31      30                              1       1       1
  145        22      23      32      31                              1       1       1
  146        23      24      33      32                              1       1       1
  147        24      25      34      33                              1       1       1
  148        25      26      35      34                              1       1       1
  149        26      27      36      35                              1       1       1
  150        19     100                                              2       2      20
                A       A       A       A       A       A       A       A       A       A       A       A       A
```

********** ANSYS INPUT DATA LISTING (TAPE18) **********

	6	12	18	24	30	36	42	48	54	60	66	72	78
	V	V	V	V	V	V	V	V	V	V	V	V	V
151	20	101							2	2	21		
152	21	102							2	2	22		
153	22	103							2	2	23		
154	23	104							2	2	24		
155	24	105							2	2	25		
156	25	106							2	2	26		
157	26	107							2	2	27		
158	27	108							2	2	28		
159	28	29	38	37					1	1	1		
160	29	30	39	38					1	1	1		
161	30	31	40	39					1	1	1		
162	31	32	41	40					1	1	1		
163	32	33	42	41					1	1	1		
164	33	34	43	42					1	1	1		
165	34	35	44	43					1	1	1		
166	35	36	45	44					1	1	1		
167	28	109							2	2	29		
168	29	110							2	2	30		
169	30	111							2	2	31		
170	31	112							2	2	32		
171	32	113							2	2	33		
172	33	114							2	2	34		
173	34	115							2	2	35		
174	35	116							2	2	36		
175	36	117							2	2	37		
176	37	38	47	46					1	1	1		
177	38	39	48	47					1	1	1		
178	39	40	49	48					1	1	1		
179	40	41	50	49					1	1	1		
180	41	42	51	50					1	1	1		
181	42	43	52	51					1	1	1		
182	43	44	53	52					1	1	1		
183	44	45	54	53					1	1	1		
184	37	118							2	2	38		
185	38	119							2	2	39		
186	39	120							2	2	40		
187	40	121							2	2	41		
188	41	122							2	2	42		
189	42	123							2	2	43		
190	43	124							2	2	44		
191	44	125							2	2	45		
192	45	126							2	2	46		
193	46	47	56	55					1	1	1		
194	47	48	57	56					1	1	1		
195	48	49	58	57					1	1	1		
196	49	50	59	58					1	1	1		
197	50	51	60	59					1	1	1		
198	51	52	61	60					1	1	1		
199	52	53	62	61					1	1	1		
200	53	54	63	62					1	1	1		
	A	A	A	A	A	A	A	A	A	A	A	A	A

	6	12	18	24	30	36	42	48	54	60	66	72	78
	V	V	V	V	V	V	V	V	V	V	V	V	V
201	46	127							2	2	47		
202	47	128							2	2	48		
203	48	129							2	2	49		
204	49	130							2	2	50		
205	50	131							2	2	51		
206	51	132							2	2	52		
207	52	133							2	2	53		
208	53	134							2	2	54		
209	54	135							2	2	55		
210	55	56	65	64					1	1	1		
211	56	57	66	65					1	1	1		
212	57	58	67	66					1	1	1		
213	58	59	68	67					1	1	1		
214	59	60	69	68					1	1	1		
215	60	61	70	69					1	1	1		
216	61	62	71	70					1	1	1		
217	62	63	72	71					1	1	1		
218	55	136							2	2	56		
219	56	137							2	2	57		
220	57	138							2	2	58		
221	58	139							2	2	59		
222	59	140							2	2	60		
223	60	141							2	2	61		
224	61	142							2	2	62		
225	62	143							2	2	63		
226	63	144							2	2	64		
227	64	65	74	73					1	1	1		
228	65	66	75	74					1	1	1		
229	66	67	76	75					1	1	1		
230	67	68	77	76					1	1	1		
231	68	69	78	77					1	1	1		
232	69	70	79	78					1	1	1		
233	70	71	80	79					1	1	1		
234	71	72	81	80					1	1	1		
235	64	145							2	2	65		
236	65	146							2	2	66		
237	66	147							2	2	67		
238	67	148							2	2	68		
239	68	149							2	2	69		
240	69	150							2	2	70		
241	70	151							2	2	71		
242	71	152							2	2	72		
243	72	153							2	2	73		
244	73	154							2	2	74		
245	74	155							2	2	75		
246	75	156							2	2	76		
247	76	157							2	2	77		
248	77	158							2	2	78		
249	78	159							2	2	79		
250	79	160							2	2	80		
	A	A	A	A	A	A	A	A	A	A	A	A	A

********** ANSYS INPUT DATA LISTING (TAPE13) **********

```
                6     12    18    24    30    35    42    48    54    60    66    72    78
                V     V     V     V     V     V     V     V     V     V     V     V     V
   251         80    161                                              2     2    81
   252         81    162                                              2     2    82
   253         11    173                                              0     6    83
   254         11    254                                              0     6    83
   255         11     92                                              3     3    84
   256         17    179                                              0     6    85
   257         17    260                                              0     6    85
   258         17     98                                              3     3    86
   259         65    227                                              0     6    87
   260         65    308                                              0     6    87
   261         65    146                                              3     3    88
   262         71    233                                              0     6    89
   263         71    314                                              0     6    89
   264         71    152                                              3     3    90
   265         31     32   194   193                                   4     4    91
   266         32     33   195   194                                   4     4    91
   267         33     42   204   195                                   4     4    92
   268         42     51   213   204                                   4     4    92
   269         31     40   202   193                                   4     4    93
   270         40     49   211   202                                   4     4    93
   271         49     50   212   211                                   4     4    94
   272         50     51   213   212                                   4     4    94
   273        193    194   275   274                                   4     4    91
   274        275    274                                              5     5    95
   275        194    195   276   275                                   4     4    91
   276        276    275                                              5     5    95
   277        195    204   285   276                                   4     4    92
   278        285    276                                              5     5    95
   279        204    213   294   285                                   4     4    92
   280        294    285                                              5     5    95
   281        193    202   283   274                                   4     4    93
   282        283    274                                              5     5    95
   283        202    211   292   283                                   4     4    93
   284        292    283                                              5     5    95
   285        211    212   293   292                                   4     4    94
   286        293    292                                              5     5    95
   287        212    213   294   293                                   4     4    94
   288        294    293                                              5     5    95
   289        293   1601                                              5     5    95
   290         -1
   291          1          0.          0.          0.
   292          2          .1250E+01   0.          0.
   293          3          .2375E+01   0.          0.
   294          4          .3500E+01   0.          0.
   295          5          .5000E+01   0.          0.
   296          6          .6500E+01   0.          0.
   297          7          .7625E+01   0.          0.
   298          8          .8750E+01   0.          0.
   299          9          .1000E+02   0.          0.
   300         10          0.                      .1210E+01   0.
                A     A     A     A     A     A     A     A     A     A     A     A     A
```

	6	12	18	24	30	36	42	48	54	60	66	72	78
	V	V	V	V	V	V	V	V	V	V	V	V	V
301	11		.1250E+01		.1250E+01	0.							
302	12		.2375E+01		.1250E+01	0.							
303	13		.3500E+01		.1250E+01	0.							
304	14		.5000E+01		.1250E+01	0.							
305	15		.6500E+01		.1250E+01	0.							
306	16		.7625E+01		.1250E+01	0.							
307	17		.8750E+01		.1250E+01	0.							
308	18		.1000E+02		.1250E+01	0.							
309	19		0.		.2375E+01	0.							
310	20		.1250E+01		.2375E+01	0.							
311	21		.2375E+01		.2375E+01	0.							
312	22		.3500E+01		.2375E+01	0.							
313	23		.5000E+01		.2375E+01	0.							
314	24		.6500E+01		.2375E+01	0.							
315	25		.7625E+01		.2375E+01	0.							
316	26		.8750E+01		.2375E+01	0.							
317	27		.1000E+02		.2375E+01	0.							
318	28		0.		.3500E+01	0.							
319	29		.1250E+01		.3500E+01	0.							
320	30		.2375E+01		.3500E+01	0.							
321	31		.3500E+01		.3500E+01	0.							
322	32		.5000E+01		.3500E+01	0.							
323	33		.6500E+01		.3500E+01	0.							
324	34		.7625E+01		.3500E+01	0.							
325	35		.8750E+01		.3500E+01	0.							
326	36		.1000E+02		.3500E+01	0.							
327	37		0.		.5000E+01	0.							
328	38		.1250E+01		.5000E+01	0.							
329	39		.2375E+01		.5000E+01	0.							
330	40		.3500E+01		.5000E+01	0.							
331	41		.5000E+01		.5000E+01	0.							
332	42		.6500E+01		.5000E+01	0.							
333	43		.7625E+01		.5000E+01	0.							
334	44		.8750E+01		.5000E+01	0.							
335	45		.1000E+02		.5000E+01	0.							
336	46		0.		.6500E+01	0.							
337	47		.1250E+01		.6500E+01	0.							
338	48		.2375E+01		.6500E+01	0.							
339	49		.3500E+01		.6500E+01	0.							
340	50		.5000E+01		.6500E+01	0.							
341	51		.6500E+01		.6500E+01	0.							
342	52		.7625E+01		.6500E+01	0.							
343	53		.8750E+01		.6500E+01	0.							
344	54		.1000E+02		.6500E+01	0.							
345	55		0.		.7625E+01	0.							
346	56		.1250E+01		.7625E+01	0.							
347	57		.2375E+01		.7625E+01	0.							
348	58		.3500E+01		.7625E+01	0.							
349	59		.5000E+01		.7625E+01	0.							
350	60		.6500E+01		.7625E+01	0.							
	A	A	A	A	A	A	A	A	A	A	A	A	A

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                    6       12      18      24      30      36      42      48      54      60      66      72      78
                    V       V       V       V       V       V       V       V       V       V       V       V       V
      351       61                .7625E+01       .7625E+01       0.
      352       62                .8750E+01       .7625E+01       0.
      353       63                .1000E+02       .7625E+01       0.
      354       64              0.                .8750E+01       0.
      355       65                .1250E+01       .8750E+01       0.
      356       66                .2375E+01       .8750E+01       0.
      357       67                .3500E+01       .8750E+01       0.
      358       68                .5000E+01       .8750E+01       0.
      359       69                .6500E+01       .8750E+01       0.
      360       70                .7625E+01       .8750E+01       0.
      361       71                .8750E+01       .8750E+01       0.
      362       72                .1000E+02       .8750E+01       0.
      363       73              0.                .1000E+02       0.
      364       74                .1250E+01       .1000E+02       0.
      365       75                .2375E+01       .1000E+02       0.
      366       76                .3500E+01       .1000E+02       0.
      367       77                .5000E+01       .1000E+02       0.
      368       78                .6500E+01       .1000E+02       0.
      369       79                .7625E+01       .1000E+02       0.
      370       80                .8750E+01       .1000E+02       0.
      371       81                .1000E+02       .1000E+02       0.
      372       82              0.                0.              -.1000E+01
      373       83                .1250E+01       0.              -.1000E+01
      374       84                .2375E+01       0.              -.1000E+01
      375       85                .3500E+01       0.              -.1000E+01
      376       86                .5000E+01       0.              -.1000E+01
      377       87                .6500E+01       0.              -.1000E+01
      378       88                .7625E+01       0.              -.1000E+01
      379       89                .8750E+01       0.              -.1000E+01
      380       90                .1000E+02       0.              -.1000E+01
      381       91              0.                .1250E+01       -.1000E+01
      382       92                .1250E+01       .1250E+01       -.1000E+01
      383       93                .2375E+01       .1250E+01       -.1000E+01
      384       94                .3500E+01       .1250E+01       -.1000E+01
      385       95                .5000E+01       .1250E+01       -.1000E+01
      386       96                .6500E+01       .1250E+01       -.1000E+01
      387       97                .7625E+01       .1250E+01       -.1000E+01
      388       98                .8750E+01       .1250E+01       -.1000E+01
      389       99                .1000E+02       .1250E+01       -.1000E+01
      390      100              0.                .2375E+01       -.1000E+01
      391      101                .1250E+01       .2375E+01       -.1000E+01
      392      102                .2375E+01       .2375E+01       -.1000E+01
      393      103                .3500E+01       .2375E+01       -.1000E+01
      394      104                .5000E+01       .2375E+01       -.1000E+01
      395      105                .6500E+01       .2375E+01       -.1000E+01
      396      106                .7625E+01       .2375E+01       -.1000E+01
      397      107                .8750E+01       .2375E+01       -.1000E+01
      398      108                .1000E+02       .2375E+01       -.1000E+01
      399      109              0.                .3500E+01       -.1000E+01
      400      110                .1250E+01       .3500E+01       -.1000E+01
                    A       A       A       A       A       A       A       A       A       A       A       A       A
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********** ANSYS INPUT DATA LISTING (TAPE18) **********

```
                    6       12      18      24      30      36      42      48      54      60      66      72      78
                    V       V       V       V       V       V       V       V       V       V       V       V       V
      401     111                   .2375E+01       .3500E+01       -.1000E+01
      402     112                   .3500E+01       .3500E+01       -.1000E+01
      403     113                   .5000E+01       .3500E+01       -.1000E+01
      404     114                   .6500E+01       .3500E+01       -.1000E+01
      405     115                   .7625E+01       .3500E+01       -.1000E+01
      406     116                   .8750E+01       .3500E+01       -.1000E+01
      407     117                   .1000E+02       .3500E+01       -.1000E+01
      408     118           0.                      .5000E+01       -.1000E+01
      409     119                   .1250E+01       .5000E+01       -.1000E+01
      410     120                   .2375E+01       .5000E+01       -.1000E+01
      411     121                   .3500E+01       .5000E+01       -.1000E+01
      412     122                   .5000E+01       .5000E+01       -.1000E+01
      413     123                   .6500E+01       .5000E+01       -.1000E+01
      414     124                   .7625E+01       .5000E+01       -.1000E+01
      415     125                   .8750E+01       .5000E+01       -.1000E+01
      416     126                   .1000E+02       .5000E+01       -.1000E+01
      417     127           0.                      .6500E+01       -.1000E+01
      418     128                   .1250E+01       .6500E+01       -.1000E+01
      419     129                   .2375E+01       .6500E+01       -.1000E+01
      420     130                   .3500E+01       .6500E+01       -.1000E+01
      421     131                   .5000E+01       .6500E+01       -.1000E+01
      422     132                   .6500E+01       .6500E+01       -.1000E+01
      423     133                   .7625E+01       .6500E+01       -.1000E+01
      424     134                   .8750E+01       .6500E+01       -.1000E+01
      425     135                   .1000E+02       .6500E+01       -.1000E+01
      426     136           0.                      .7625E+01       -.1000E+01
      427     137                   .1250E+01       .7625E+01       -.1000E+01
      428     138                   .2375E+01       .7625E+01       -.1000E+01
      429     139                   .3500E+01       .7625E+01       -.1000E+01
      430     140                   .5000E+01       .7625E+01       -.1000E+01
      431     141                   .6500E+01       .7625E+01       -.1000E+01
      432     142                   .7625E+01       .7625E+01       -.1000E+01
      433     143                   .8750E+01       .7625E+01       -.1000E+01
      434     144                   .1000E+02       .7625E+01       -.1000E+01
      435     145           0.                      .8750E+01       -.1000E+01
      436     146                   .1250E+01       .8750E+01       -.1000E+01
      437     147                   .2375E+01       .8750E+01       -.1000E+01
      438     148                   .3500E+01       .8750E+01       -.1000E+01
      439     149                   .5000E+01       .8750E+01       -.1000E+01
      440     150                   .6500E+01       .8750E+01       -.1000E+01
      441     151                   .7625E+01       .8750E+01       -.1000E+01
      442     152                   .8750E+01       .8750E+01       -.1000E+01
      443     153                   .1000E+02       .8750E+01       -.1000E+01
      444     154           0.                      .1000E+02       -.1000E+01
      445     155                   .1250E+01       .1000E+02       -.1000E+01
      446     156                   .2375E+01       .1000E+02       -.1000E+01
      447     157                   .3500E+01       .1000E+02       -.1000E+01
      448     158                   .5000E+01       .1000E+02       -.1000E+01
      449     159                   .6500E+01       .1000E+02       -.1000E+01
      450     160                   .7625E+01       .1000E+02       -.1000E+01
                    A       A       A       A       A       A       A       A       A       A       A       A       A
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                6       12      18      24      30      36      42      48      54      60      66      72      78
                V       V       V       V       V       V       V       V       V       V       V       V       V
  451     161           .8750E+01   .1000E+02  -.1000E+01
  452     152           .1000E+02   .1000E+02  -.1000E+01
  453     173           .2250E+01   .1250E+01   0.
  454     234           .1250E+01   .2250E+01   0.
  455     179           .9750E+01   .1250E+01   0.
  456     260           .8750E+01   .2250E+01   0.
  457     227           .2250E+01   .8750E+01   0.
  458     308           .1250E+01   .9750E+01   0.
  459     233           .9750E+01   .8750E+01   0.
  460     314           .8750E+01   .9750E+01   0.
  461     193           .3500E+01   .3500E+01   .1500E+01
  462     194           .5000E+01   .3500E+01   .1500E+01
  463     195           .6500E+01   .3500E+01   .1500E+01
  464     294           .6500E+01   .5000E+01   .1500E+01
  465     213           .6500E+01   .6500E+01   .1500E+01
  466     193           .3500E+01   .3500E+01   .1500E+01
  467     202           .3500E+01   .5000E+01   .1500E+01
  468     211           .3500E+01   .6500E+01   .1500E+01
  469     212           .5000E+01   .6500E+01   .1500E+01
  470     274           .3500E+01   .3500E+01   .3000E+01
  471     275           .5000E+01   .3500E+01   .3000E+01
  472     276           .6500E+01   .3500E+01   .3000E+01
  473     285           .6500E+01   .5000E+01   .3000E+01
  474     294           .6500E+01   .6500E+01   .3000E+01
  475     274           .3500E+01   .3500E+01   .3000E+01
  476     283           .3500E+01   .5000E+01   .3000E+01
  477     292           .3500E+01   .6500E+01   .3000E+01
  478     293           .5000E+01   .6500E+01   .3000E+01
  479     1601          .5000E+01   .5000E+01   .3000E+01
  480      -1
  481  EX      1         .2900E+05
  482  EY      1         .2900E+05
  483  NUXY    1         .3000E+00
  484  ALPX    1      0.
  485  ALPY    1      0.
  486  DENS    1      0.
  487  EX      2         .6017E+03
  488  ALPX    2      0.
  489  DENS    2      0.
  490  EX      3         .2900E+05
  491  ALPX    3      0.
  492  DENS    3      0.
  493  EX      4         .2900E+05
  494  EY      4         .2900E+05
  495  NUXY    4         .3000E+00
  496  ALPX    4      0.
  497  ALPY    4      0.
  498  DENS    4      0.
  499  EX      5         .2900E+05
  500  ALPX    5      0.
                A       A       A       A       A       A       A       A       A       A       A       A       A
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********** ANSYS INPUT DATA LISTING (TAPE13) **********

```
                 6    12    18    24    30    36    42    48    54    60    66    72    78
                 V     V     V     V     V     V     V     V     V     V     V     V     V
  501   VUXY   5         .3000E+00
  502   DENS   5         1.
  503   END
  504     1   -10  10
  505                                                                                    1
  506                                                    1
  507        82 UX      0.                          152        UY    UZ
  508       172 UX                                  254    81  UY    UZ
  509       179 UX                                  260    81  UY    UZ
  510       227 UX                                  338    81  UY    UZ
  511       233 UX                                  314    81  UY    UZ
  512           END
  513      1601 FY       -.1667E+01
  514      1601 MX       .1500E+02
  515           -1
  516        -1
  517   FINISH
```