EN DES CALCULATIONS

TITLE	UNID SYSTEM(S)	PLANT/UNIT
EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS		All units
		SAR SECTION(S)

PREPARING ORGANIZATION		REV	(FOR MEDS USE)	MEDS ACCESSION NUMBER
CEB		R0	840229A0029	CEB '84 0227 001
APPLICABLE DESIGN DOCUMENTS: DS-C1.7.1	BRANCH/PROJECT IDENTIFIERS: CSG-85-001	R1	840613C0022	CEB '84 0522 011
		R2		B41 '85 0731 002
KEY NOUNS: Baseplates, Expansion Anchors		R3		

REV	R0	R1	R2	R3
DATE	2/24/84	5/22/84	JUL 31 1985	
PREPARED	S.B. Ramey	S.B. Ramey	[signature]	
CHECKED	E.J. Knuettel	E.J. Knuettel	[signature]	
SUBMITTED	N.H. Perry	N.H. Perry	[signature]	
APPROVED	C. Glidewell	C. Glidewell	N.A. [signature]	
ATTACHMENTS MICROFILMED:				
LIST ALL PAGES* ADDED BY THIS REV:			PAGES 40A THRU 40L	
LIST ALL PAGES* DELETED BY THIS REV:				
LIST ALL PAGES* CHANGED BY THIS REV:			PAGES 1 & 3	

STATEMENT OF PROBLEM

Civil Design Standard DS-C1.7.1 for General Anchorage to Concrete - Determination of Tensile Loads for Expansion Anchors - Evaluation of Plate Rigidity Requirement for Use of Rigid Baseplate Analysis

ABSTRACT

To evaluate the requirements for use of rigid plate analysis given in DS-C1.7.1, four sizes of plates were analyzed. The plates were sized to produce edge distances from the face of the attachment of 4- and 6-plate thicknesses. A pattern of eight expansion anchors was used on all of the plates. Two load conditions, axial load only and bi-axial moments only, were applied to the plates through a centered attachment. Analysis was performed using the CASD BAP program (a rigid analysis program) and Baseplate II (a finite element flexible analysis program). The results were compared to show the requirements for rigid baseplate analysis given in design Design Standard DS-C1.7.1 are acceptable.

Computer output on microfilm roll # 50100

R1 Clarified statement on page 2

R2 ADDITIONAL CALCULATIONS WERE ADDED FOR THE EVALUATION OF THE EFFECTS OF COMBINED AXIAL (TENSION) AND BI-AXIAL BENDING ON THE REQUIREMENTS OF RIGID PLATE ANALYSIS.

Please return originals to NHL Perry (W9B108)

TVA 10697 (ENDES-7-78) *Use revision log (form TVA 10534) if more room is required

INDEX

R2

SHEET 1 OF 40
EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS
COMPUTED TBR DATE 7/30/85
CHECKED LS DATE 7-30-85

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS DS-C1.7.1

PURPOSE

To evaluate the baseplate rigidity requirements given in Design Standard DS-C1.7.1, and to show that the requirements for baseplate analysis give acceptable anchor loads.

ASSUMPTIONS

1. An average anchor stiffness of 100 k/in was assumed for a 3/4-inch-diameter expansion anchor. A stiffness of 300 k/in was also used in the evaluation.

2. 3/4-inch-diameter self-drilling expansion anchors were used for the rigid evaluation.

DISCUSSION

The plates were sized to give the required distance between the face of the attachment and the edge of the plate. An 8-bolt pattern was selected to obtain varied spacings between the attachment and the anchors. For the smaller plates, 10-inch and 13-inch, the closer anchor spacings would be unacceptable with respect to concrete capacity but are conservative with respect to anchor load distribution. The configurations of plate size, anchor spacings, attachment size, and applied loads were used only for this evaluation and do not represent actual designs. For some of the configurations, the stress in the plate and tube section exceeds normal allowables. However, for this comparative analysis plate, stresses do not affect the results.

Table 1 summarizes the results from the evaluation. The rigid method for plates loaded with moment gives conservative anchor loads for the 4t edge distance and a Kt=100 k/in. A 4t extension with an anchor stiffness of 300 k/in only under estimates the anchor load by 4 percent.

For the axial load condition, the flexible analysis will always give higher anchor loads than a rigid plate analysis unless all anchors are equidistant from the attachment. Even a smaller edge distance of 2t as given in the NCR 79-02 Bulletin will give an underestimation of the anchor loads by a few percent. For an anchor stiffness of 100 k/in, a rigid plate analysis for a plate with a 4t extension will result in an underestimation of the anchor load by only 5 percent. | R|

CONCLUSION

Based on the above discussion, the 4t limitation for use of rigid plate analysis given in DS-C1.7.1 is acceptable for expansion anchors.

SHEET 2 OF 40
EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS
COMPUTED TBL DATE 5/22/84
CHECKED EJK DATE 5/22/84

TABLE 1

Plate Size	Edge Dist.	CASDBAP	Maximum Anchor Loadings, kips BASEPLATE II K = 100 k/in	* %	BASEPLATE II K = 300 k/in	* %
Bi-Axial Moment Loading						
10x10x3/4	4t	4.96	4.30	+15	4.78	+ 4
13x13x3/4	6t	4.46	4.44	-	4.51	- 1
16x16x1-1/2	4t	3.90	3.62	+ 8	4.06	- 4
22x22x1-1/2	6t	3.44	3.66	- 6	3.68	- 7
Axial Loading						
10x10x3/4	4t	2.50	2.62	- 5	2.82	-11
13x13x3/4	6t	2.88	3.35	-14	4.03	-29
16x16x1-1/2	4t	3.25	3.43	- 5	3.74	-13
22x22x1-1/2	6t	3.75	4.26	-12	5.03	-25
Combined Axial and Bi-axial Moment Loading						
10x10x3/4	4t	5.11	4.44	+15	4.91	+ 4
13x13x3/4	6t	3.58	3.53	+ 1	3.35	+ 7
16x16x1-1/2	4t	2.75	2.55	+ 8	2.83	- 3
22x22x1-1/2	6t	1.88	1.95	- 4	1.93	- 3

* % = ((Rigid-Flexible)/Flexible) x 100%

SHEET 3 OF 40
EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS
COMPUTED FBR DATE 7/30/85
CHECKED LS DATE 7-30-85

REFERENCES

1. TVA Civil Design Standard DS-C1.7.1, Revision 1 Concrete Anchorages.

2. TVA Computer Program "CASDBAP" rigid baseplate analysis. TVA program identification number 262256.

3. Cybernet Services computer program "BASEPLATE II" finite element flexible plate analysis. BASEPLATE II User Manual Publication number 84002770.

SHEET 4 OF 40
EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS
COMPUTED TBL DATE 2/10/84
CHECKED [illegible] DATE 2/13/84

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

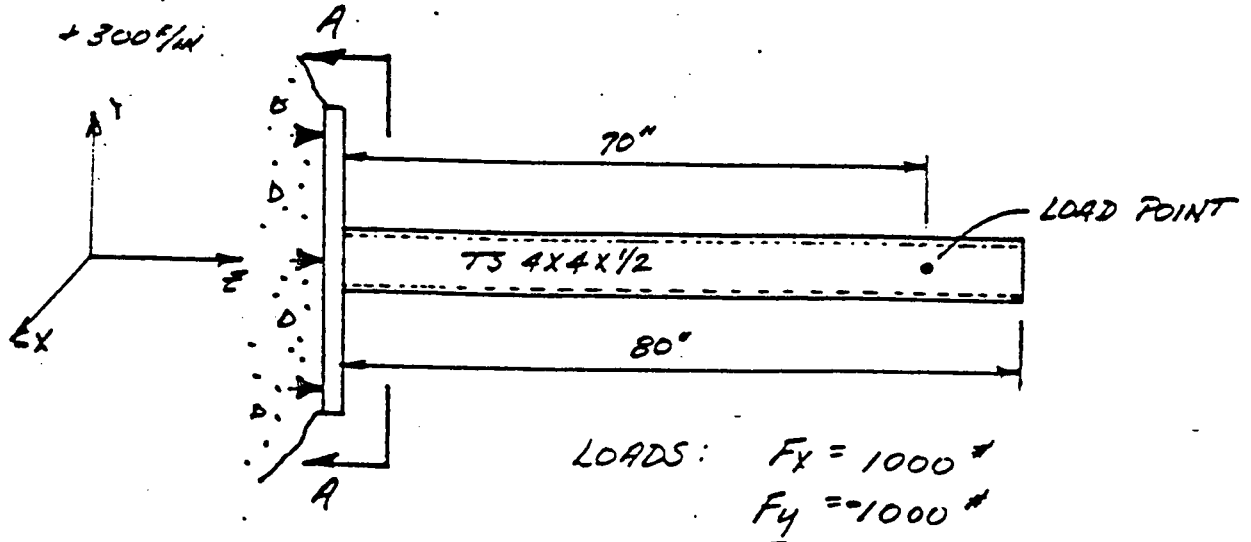
DS-C1.7.1

COMPUTED TRR DATE 1/31/84

CHECKED [illegible] DATE 1/31/84

PLATE SIZE – 10" x 10" x 3/4"

K_t = 100 #/in
+ 300 #/in



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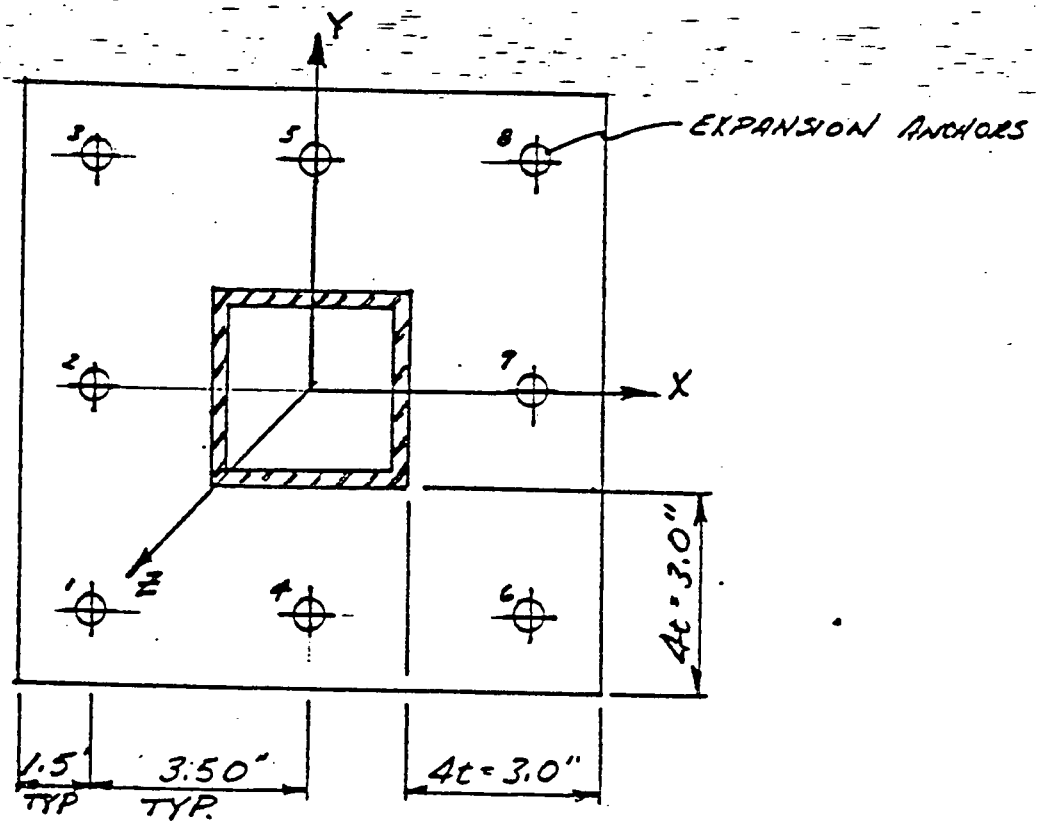
F_z = 0



SECTION A-A

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

DS-C1.7.1

COMPUTED TBR DATE 1/31/84

CHECKED [illegible] DATE 1/31/84

SUMMARY OF RESULTS FOR PLATE SIZE 10"X10"X 3/4"

ANCHOR LOADS

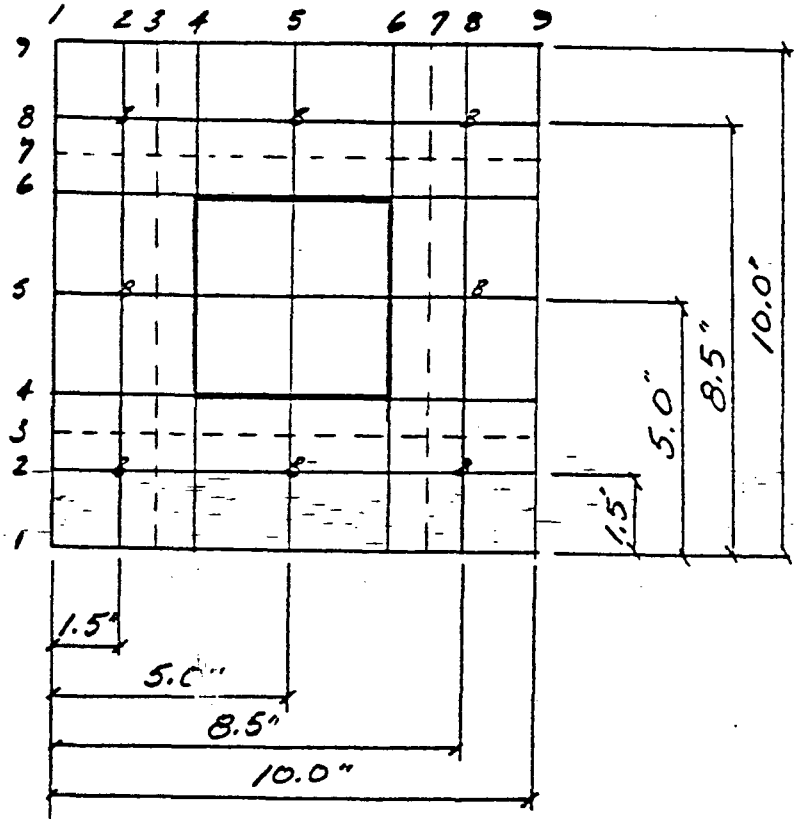
ANCHOR NUMBER	RIGID KIPS	FLEXIBLE, KIPS	
		$K_t = 100^{K}/_{IN}$	$K_t = 300^{K}/_{IN}$
1	1.22	1.55	1.36
2	3.09	3.06	3.53
3	4.96	4.30	4.78
4	0	.34	0
5	3.09	3.06	3.53
6	0	0	0
7	0	.34	0
8	1.22	1.55	1.36

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBR DATE 1/28/84
CHECKED GDL DATE 1/31/84

BASEPLATE II (FINITE ELEMENT) MODEL

2 10"X10"X 3/4"
K_t = 100 K/IN, 300 K/IN



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LIST

 84/01/21. 07.27.59.
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00110 3.9,NC,1.5
00120 10,10,1.1
00130 8
00140 SD,.75,1.5,1.5
00150 SD,.75,1.5,5.0
00160 SD,.75,1.5,8.5
00170 SD,.75,5.0,1.5
00180 SD,.75,5.0,8.5
00190 SD,.75,8.5,1.5
00200 SD,.75,8.5,5.0
00210 SD,.75,8.5,8.5
00220 4.4,5.0,5.0
00230 0,0,0,5.83,5.83,0
READY.
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SHEET 8 OF 40

EVALUATION OF ESSENTIAL EQUITY REQUIREMENTS

COMPUTED TBK DATE 1/21/84

CHECKED [illegible] DATE 1/31/84

READY.

84/01/21. 07.29.30.
PROGRAM CASDOUT

WIDTH OF PLATE = 10 INCHES
LENGTH OF PLATE= 10 INCHES
MODULAR RATIO= 9

ANCHOR NUMBER	AREA IN	X ORDINATE IN	Y ORDINATE IN
1	.334	1.5	1.5
2	.334	1.5	5
3	.334	1.5	8.5
4	.334	5	1.5
5	.334	5	8.5
6	.334	8.5	1.5
7	.334	8.5	5
8	.334	8.5	8.5

LOAD CONDITION NUMBER= 1

ATTACHMENT 1
VERT LOAD= 0 KIPS LOCATION X= 5 INCHES Y= 5 INCHES
APPLIED MOMENT ABOUT Y AXIS= 5.83 KIP FEET
APPLIED MOMENT ABOUT X AXIS= 5.83 KIP FEET

SUMMATION OF APPLIED LOADS FOR 1 ATTACHMENT(S)= 0 KIP(S)
TRANSLATED MOMENT CENTERLINE ABOUT Y AXIS= 5.83 KIP FEET
TRANSLATED MOMENT CENTERLINE ABOUT X AXIS= 5.83 KIP FEET

PARTIAL PRESSURE CASE

CONCRETE PRESSURE (KSI)
C2=-1.37

CONCRETE PRESSURE FORCE,CF=-13.6 KIPS
LOCATION IN X-DIRECTION= 5.07 INCHES
LOCATION IN Y-DIRECTION= 1.93 INCHES

FRICTION SHEAR CAPACITY,SF= 6.8 KIPS

PRESSURE BULB GEOMETRY
Z3= 7.71
Z6= 7.71

ANCHOR NUMBER	STRESS GROSS AREA (KSI)	LOAD KIPS
1	3.66	1.22
2	9.26	3.09
3	14.86	4.96
5	9.28	3.09
8	3.66	1.22

SHEET 9 OF 40
EVALUATION OF EXPERT RIGIDITY REQUIREMENTS
COMPUTED TBE DATE 1/24/84
CHECKED PLL DATE 1/31/84

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

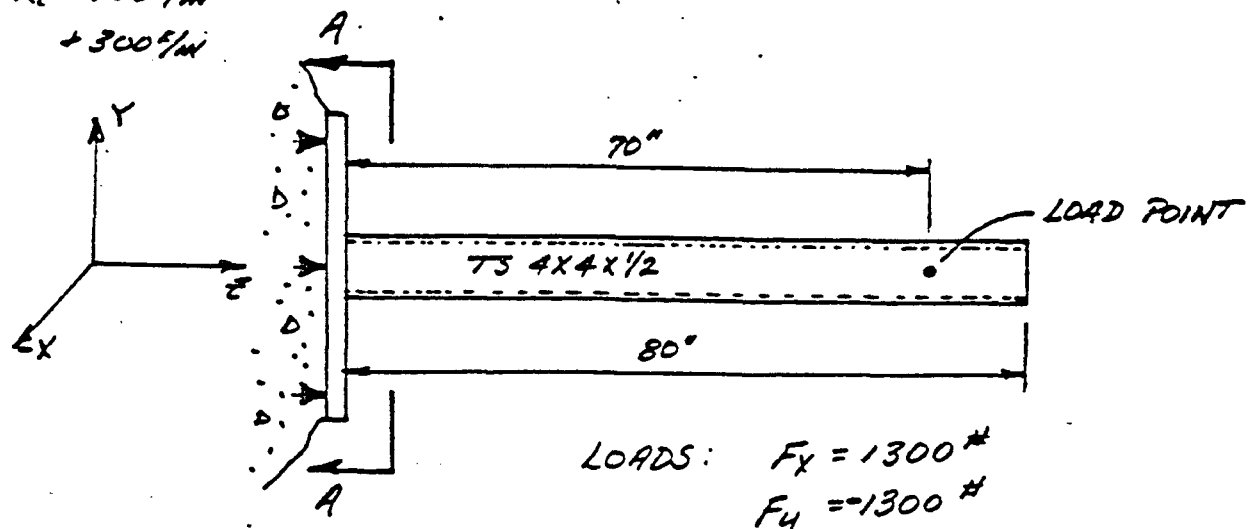
DS-C1.7.1

COMPUTED TBR DATE 1/31/84

CHECKED [illegible] DATE 1/31/84

PLATE SIZE – 13" x 13" x 3/4"

K_t = 100 K/in
+300 K/in



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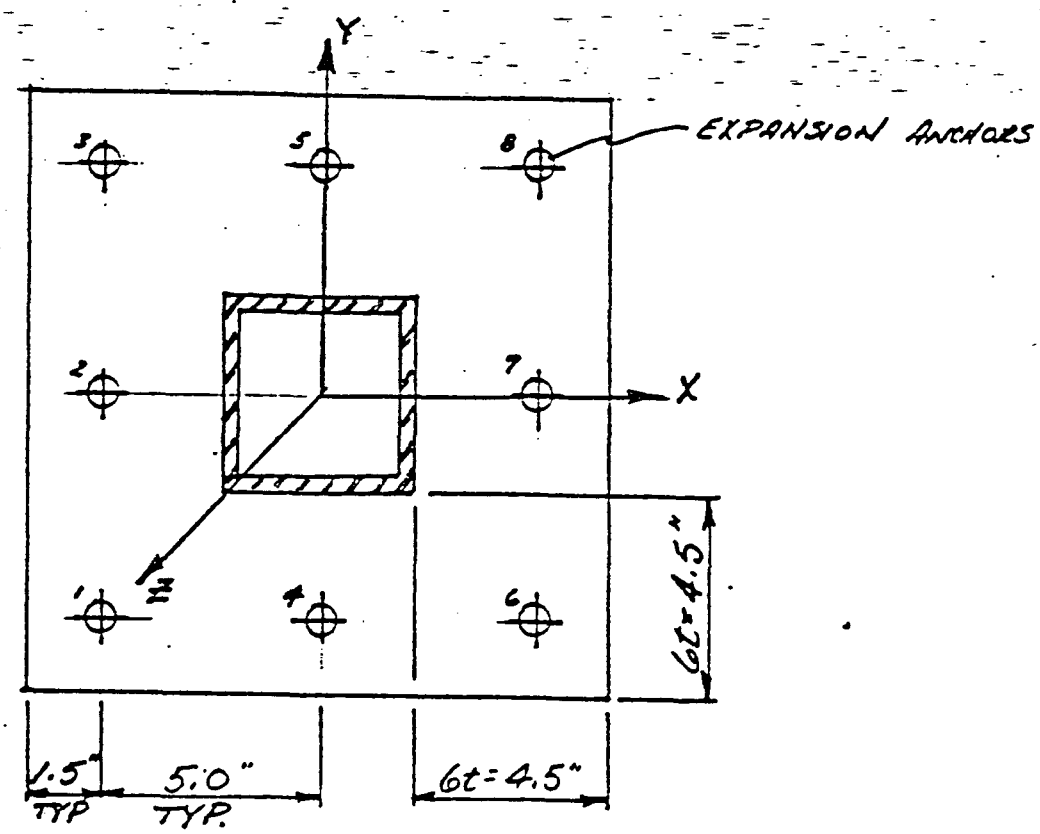
F_y = -1300 #
F_z = 0 #



SECTION A-A

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

DS-C1.7.1

COMPUTED TBR DATE 1/31/8

CHECKED EAL DATE 1/31/8

SUMMARY OF RESULTS FOR PLATE SIZE 13"X13"X3/4"

ANCHOR LOADS

ANCHOR NUMBER	RIGID KIPS	FLEXIBLE, KIPS	
		K_T = 100 K/IN	K_T = 300 K/IN
1	1.28	1.27	.98
2	2.87	3.57	4.51
3	4.46	4.44	4.23
4	0	.21	.04
5	2.87	3.57	4.51
6	0	0	0
7	0	.21	.04
8	1.28	1.27	.98

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

DS-C1.7.1

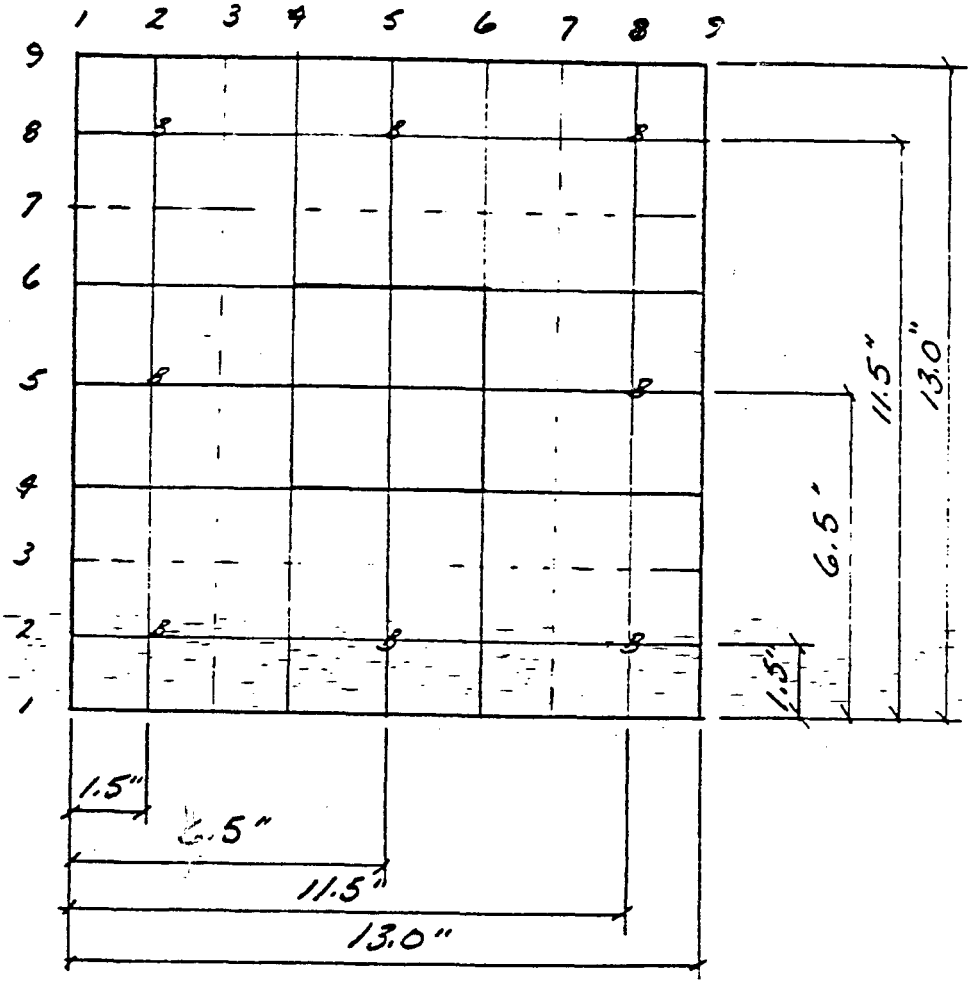
COMPUTED TSR DATE 1/20/84

CHECKED [illegible] DATE 1/31/84

BASEPLATE II (FINITE ELEMENTS) MODEL

PL 13"X13"X 3/4"

Kt= 100 K/IN, 300 K/IN



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LIS

 84/01/21. 07.37.17.
PROGRAM   BAPI3

00100 1.4.UH,0
00110 3.9.HC,1.5
00120 13,13,1,1
00130 8
00140 SD,.75,1.5,1.5
00150 SD,.75,1.5,6.5
00160 SD,.75,1.5,11.5
00170 SD,.75,6.5,1.5
00180 SD,.75,6.5,11.5
00190 SD,.75,11.5,1.5
00200 SD,.75,11.5,6.5
00210 SD,.75,11.5,11.5
00220 4,4,6.5,6.5
00230 0,0,0,7.58,7.50,0
READY.
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EVALUATION OF [illegible]
[illegible] REQUIREMENTS

COMPUTED TBR DATE 1/21/84

CHECKED [illegible] DATE 1/31/84

21/21. 07.38.18.
PROGRAM CASTOUT

WIDTH OF PLATE = 13 INCHES
LENGTH OF PLATE= 13 INCHES
MODULAR RATIO= 9

ANCHOR NUMBER	AREA IN	X ORDINATE IN	Y ORDINATE IN
1	.334	1.5	1.5
2	.334	1.5	6.5
3	.334	1.5	11.5
4	.334	6.5	1.5
5	.334	6.5	11.5
6	.334	11.5	1.5
7	.334	11.5	6.5
8	.334	11.5	11.5

LOAD CONDITION NUMBER= 1

ATTACHMENT 1
VERT LOAD= 0 KIPS LOCATION X= 6.5 INCHES Y= 6.5 INCHES
APPLIED MOMENT ABOUT Y AXIS= 7.58 KIP FEET
APPLIED MOMENT ABOUT X AXIS= 7.58 KIP FEET

SUMMATION OF APPLIED LOADS FOR 1 ATTACHMENT(S)= 0 KIP(S)
TRANSLATED MOMENT CENTERLINE ABOUT Y AXIS= 7.58 KIP FEET
TRANSLATED MOMENT CENTERLINE ABOUT X AXIS= 7.58 KIP FEET

PARTIAL PRESSURE CASE

CONCRETE PRESSURE (KSI)
C2= .95

CONCRETE PRESSURE FORCE,CF=-12.76 KIPS
LOCATION IN X-DIRECTION= 10.76 INCHES
LOCATION IN Y-DIRECTION= 8.24 INCHES

FRICTION SHEAR CAPACITY,SF= 6.38 KIPS

PRESSURE BULB GEOMETRY
Z3= 8.98
Z6= 8.98

ANCHOR NUMBER	STRESS GROSS AREA (KSI)	LOAD KIPS
1	3.83	1.28
2	8.59	2.87
3	13.38	4.46
5	8.59	2.87
8	3.83	1.28

SHEET 14 OF 40
EVALUATION OF BASEPLATE
RIGIDITY REQUIREMENTS
COMPUTED TRE DATE 1/21/84
CHECKED EJH DATE 1/24/84

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

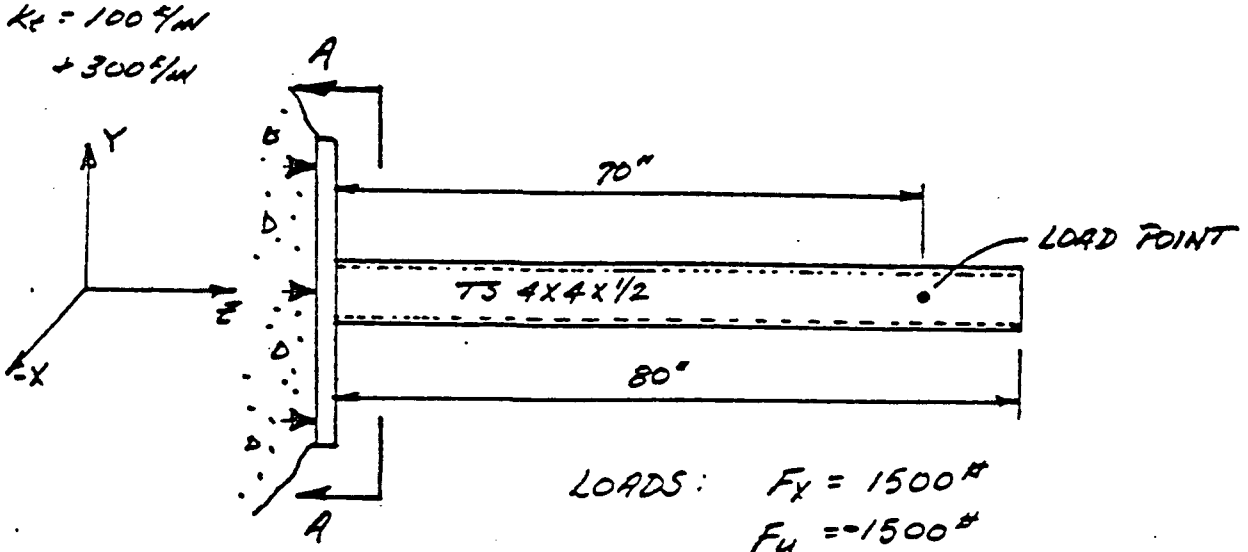
DS-C1.7.1

COMPUTED TBR DATE 1/31/84

CHECKED [illegible] DATE 1/31/84

PLATE SIZE – 16" x 16" x 1 1/2"

k_t = 100 #/in
+ 300 #/in



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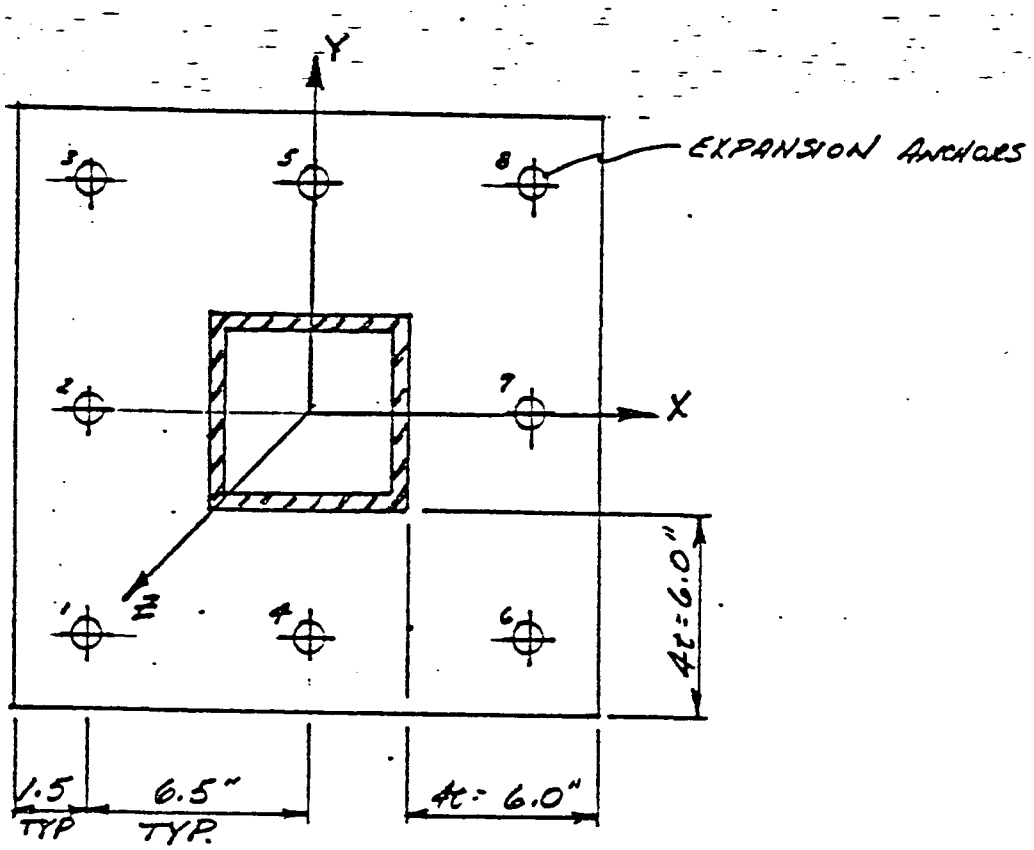


SECTION A-A

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

DS-C1.7.1

COMPUTED TBR DATE 1/31/84

CHECKED [illegible] DATE 1/31/84

SUMMARY OF RESULTS FOR PLATE SIZE 16"x16"x1 1/2"

ANCHOR LOADS

ANCHOR NUMBER	RIGID KIPS	FLEXIBLE, KIPS	
		K_T = 100 K/IN	K_T = 300 K/IN
1	1.23	1.16	1.02
2	2.56	2.56	3.09
3	3.90	3.62	4.06
4	0	.19	0
5	2.56	256	3.09
6	0	0	0
7	0	.19	0
8	1.23	1.16	1.02

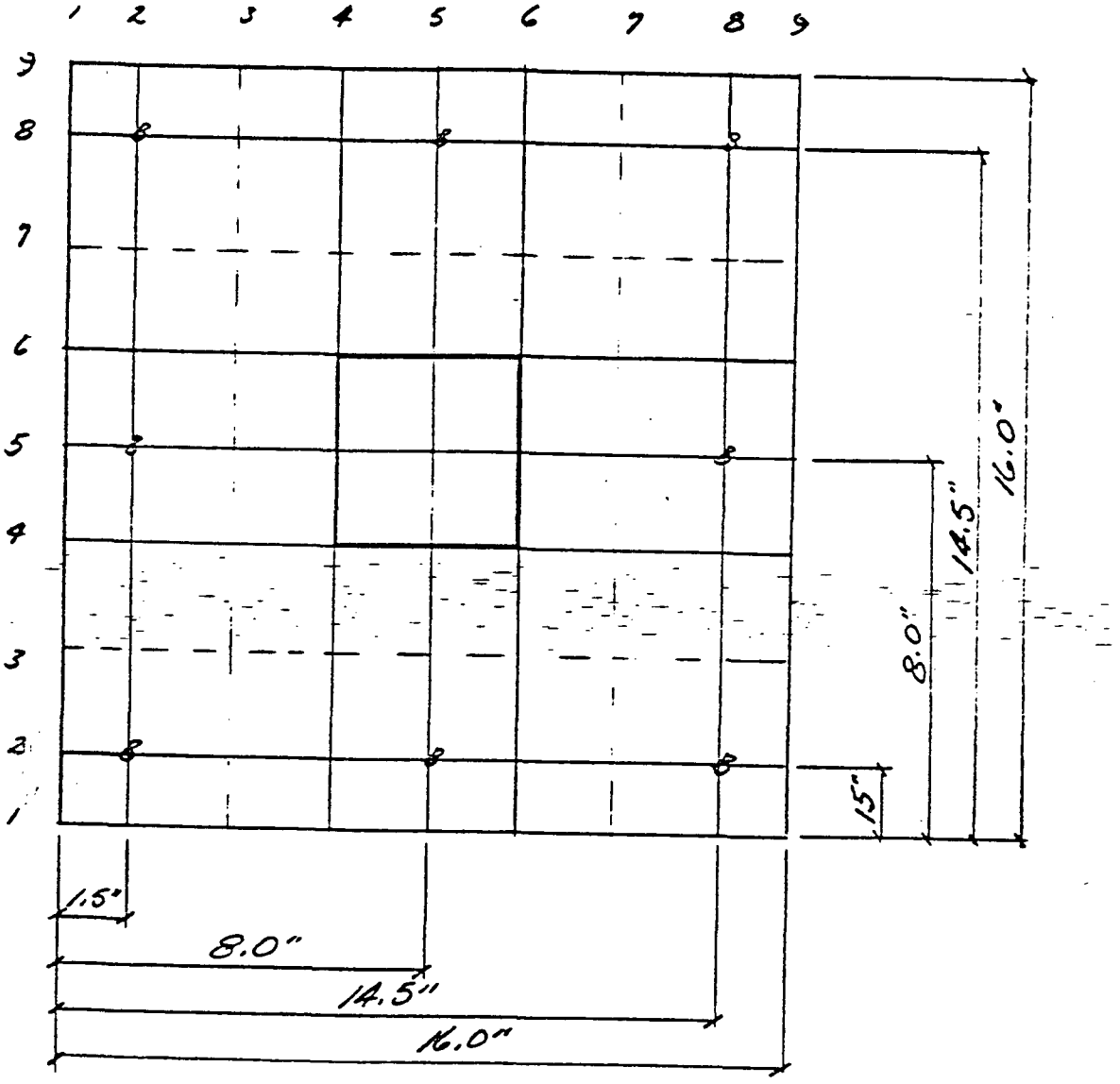
EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

DS-C1.7.1

COMPUTED TJC DATE 1/20/84

CHECKED PJH DATE 1/31/84

BASEPLATE II (FINITE ELEMENTS) MODEL
R 16"x16"x1½"
Kt= 100 K/IN, 300 K/IN



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IS

 84/01/21. 07.39.03.
PROGRAM   BAP16

00100 1,4,UN,0
00110 3,9,NC,1.5
00120 16,16,1,1
00130 8
00140 SD,.75,1.5,1.5
00150 SD,.75,1.5,8.0
00160 SD,.75,1.5,14.5
00170 SD,.75,8.0,1.5
00180 SD,.75,8.0,14.5
00190 SD,.75,14.5,1.5
00200 SD,.75,14.5,8.0
00210 SD,.75,14.5,14.5
00220 4,4,8.0,8.0
00230 0.0,0,8.75,8.75,0
READY.
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EVALUATION OF DISCRETE RIGIDITY REQUIREMENTS

COMPUTED TBE DATE 1/21/84

CHECKED [illegible] DATE 1/31/84

84/01/21. 07.40.04.
PROGRAM CASDOUT

WIDTH OF PLATE = 16 INCHES
LENGTH OF PLATE= 16 INCHES
MODULAR RATIO= 9

ANCHOR NUMBER	AREA IN	X ORDINATE IN	Y ORDINATE IN
1	.334	1.5	1.5
2	.334	1.5	8
3	.334	1.5	14.5
4	.334	8	1.5
5	.334	8	14.5
6	.334	14.5	1.5
7	.334	14.5	8
8	.334	14.5	14.5

LOAD CONDITION NUMBER= 1

ATTACHMENT 1
VERT LOAD= 0 KIPS LOCATION X= 8 INCHES Y= 8 INCHES
APPLIED MOMENT ABOUT Y AXIS= 8.75 KIP FEET
APPLIED MOMENT ABOUT X AXIS= 8.75 KIP FEET

SUMMATION OF APPLIED LOADS FOR 1 ATTACHMENT(S)= 0 KIP(S)
TRANSLATED MOMENT CENTERLINE ABOUT Y AXIS= 8.75 KIP FEET
TRANSLATED MOMENT CENTERLINE ABOUT X AXIS= 8.75 KIP FEET

PARTIAL PRESSURE CASE

CONCRETE PRESSURE (KSI)
C2=-.68

CONCRETE PRESSURE FORCE,CF=-11.47 KIPS
LOCATION IN X-DIRECTION= 13.49 INCHES
LOCATION IN Y-DIRECTION= 2.51 INCHES

FRICTION SHEAR CAPACITY,SF= 5.74 KIPS

PRESSURE BULB GEOMETRY
Z3= 10.03
Z6= 10.03

ANCHOR NUMBER	STRESS GROSS AREA (KSI)	LOAD KIPS
1	3.67	1.23
2	7.67	2.56
3	11.67	3.9
5	7.67	2.56
8	3.67	1.23

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

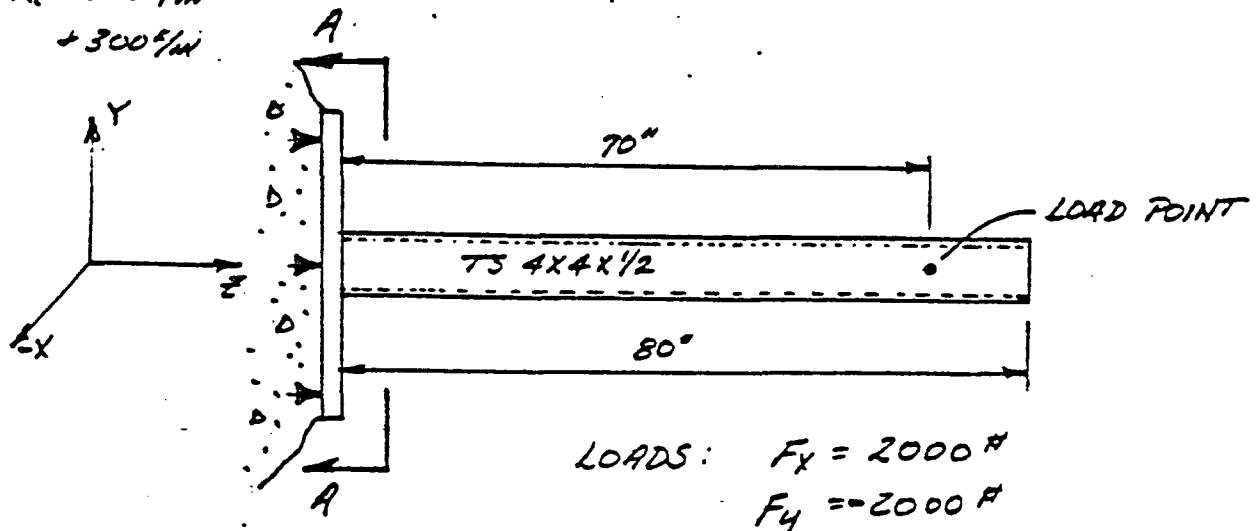
DS-C1.7.1

COMPUTED TBR DATE 1/31/84

CHECKED [signature] DATE 1/31/84

PLATE SIZE – 22" x 22" x 1 1/2"

K_z = 100 #/in
+300 #/in



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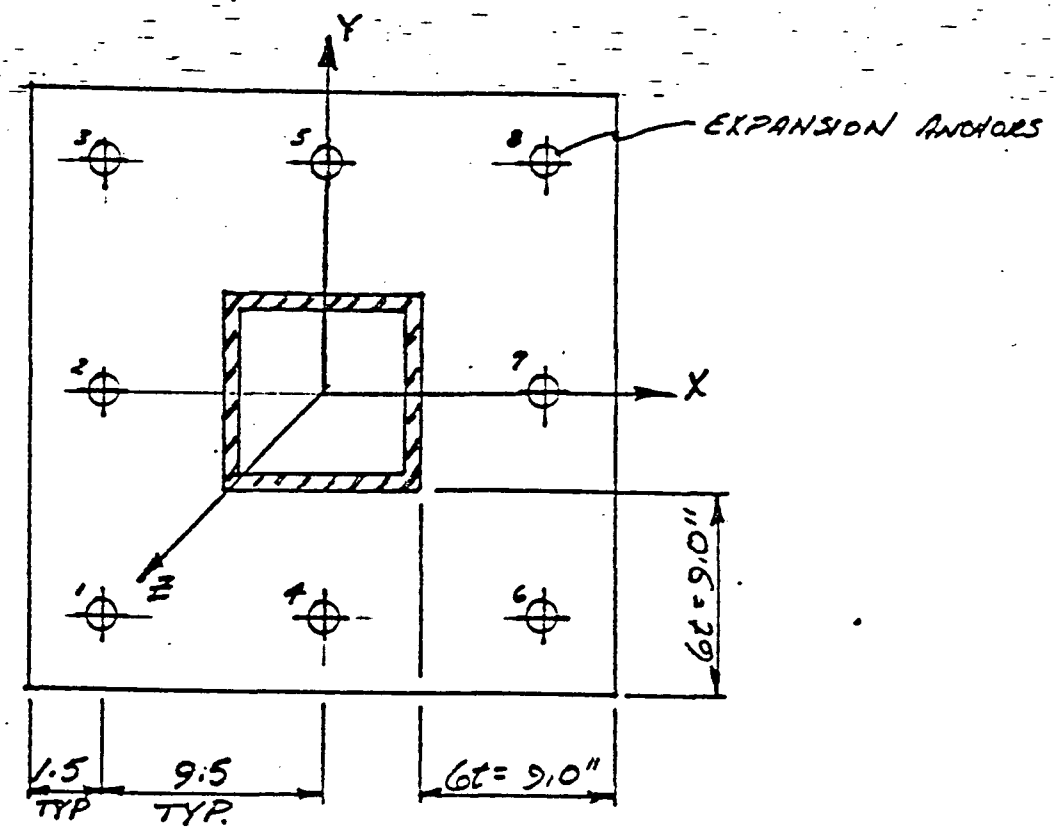
F_z = 0 #



SECTION A-A

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

DS-C1.7.1

COMPUTED TBR DATE 1/31/84

CHECKED [illegible] DATE 1/31/84

SUMMARY OF RESULTS
FOR PLATE SIZE 22"x22"x1 1/2"

ANCHOR LOADS

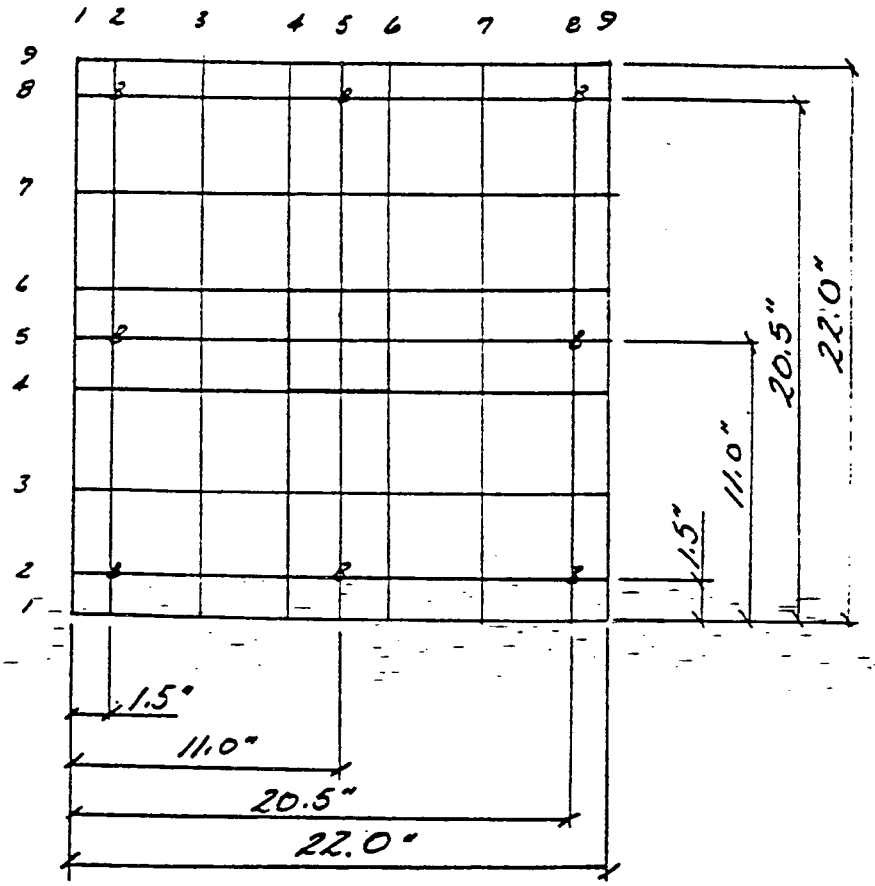
ANCHOR NUMBER	RIGID KIPS	FLEXIBLE, KIPS	
		K_f = 100 K/in	K_f = 300 K/in
1	1.20	.94	.75
2	2.32	2.77	3.56
3	3.44	3.66	3.68
4	.09	.07	0
5	2.32	2.77	3.56
6	0	0	0
7	.09	.07	0
8	1.20	.94	.75

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

DS-C.1.7.1

COMPUTED TEC DATE 1/20/84
CHECKED [illegible] DATE 1/31/84

BASEPLATE II (FINITE ELEMENTS) MODEL
R 22"x22"x 1½"
K_t = 100 K/IN, 500 K/IN



EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBR DATE 1/21/84

CHECKED [signature] DATE 1/31/84

```
LIS

 34/61/21.  07.40.45.
PROGRAM  BAP22

00160 1,4,UN,0
00110 3,9,INC,1.5
00120 22,22,1,1
00130 8
00140 SD,.75,1.5,1.5
00150 SD,.75,1.5,11.0
00160 SD,.75,1.5,20.5
00170 SD,.75,11.0,1.5
00180 SD,.75,11.0,20.5
00190 SD,.75,20.5,1.5
00200 SD,.75,20.5,11.0
00210 SD,.75,20.5,20.5
00220 4,4,11.0,11.0
00230 0,0,0,11.66,11.66,0
READY.
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.42.40.
PROGRAM CASDOUT

WIDTH OF PLATE = 22 INCHES
LENGTH OF PLATE= 22 INCHES
MODULAR RATIO= 9

ANCHOR NUMBER	AREA IN	X ORDINATE IN	Y ORDINATE IN
1	.334	1.5	1.5
2	.334	1.5	11
3	.334	1.5	20.5
4	.334	11	1.5
5	.334	11	20.5
6	.334	20.5	1.5
7	.334	20.5	11
8	.334	20.5	20.5

LOAD CONDITION NUMBER= 1

ATTACHMENT 1
VERT LOAD= 0 KIPS LOCATION X= 11 INCHES Y= 11 INCHES
APPLIED MOMENT ABOUT Y AXIS= 11.66 KIP FEET
APPLIED MOMENT ABOUT X AXIS= 11.66 KIP FEET

SUMMATION OF APPLIED LOADS FOR 1 ATTACHMENT(S)= 0 KIP(S)
TRANSLATED MOMENT CENTERLINE ABOUT Y AXIS= 11.66 KIP FEET
TRANSLATED MOMENT CENTERLINE ABOUT X AXIS= 11.66 KIP FEET

PARTIAL PRESSURE CASE

CONCRETE PRESSURE (KSI)
C2=-.45

CONCRETE PRESSURE FORCE,CF=-10.57 KIPS
LOCATION IN X-DIRECTION= 19.06 INCHES
LOCATION IN Y-DIRECTION= 2.04 INCHES

FRICTION SHEAR CAPACITY,SF= 5.53 KIPS

PRESSURE BULB GEOMETRY
Z1= 11.78
Z6= 11.78

ANCHOR NUMBER	STRESS GROSS AREA (KSI)	LOAD KIPS
1	3.61	1.2
2	6.96	2.32
3	10.31	3.44
4	.26	.09
5	6.96	2.32
7	.26	.09
8	3.61	1.2

SHEET 24 OF 40
EVALUATION OF BASCART
Equipment Requirements
COMPUTED TBR DATE 1/21/84
CHECKED DH DATE 1/31/84

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

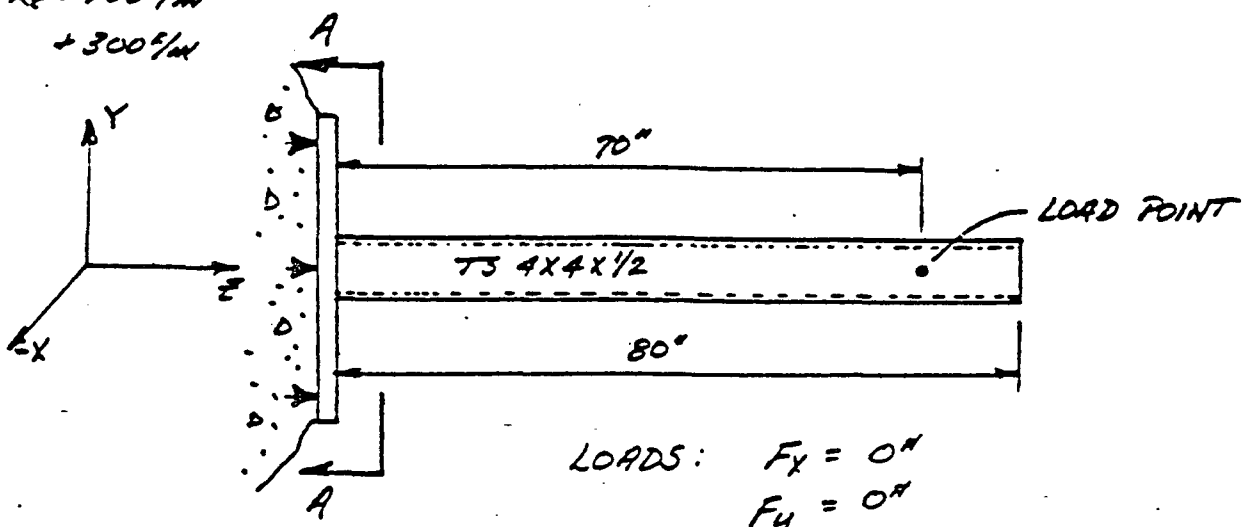
DS-C1.7.1

COMPUTED TBR DATE 1/31/84

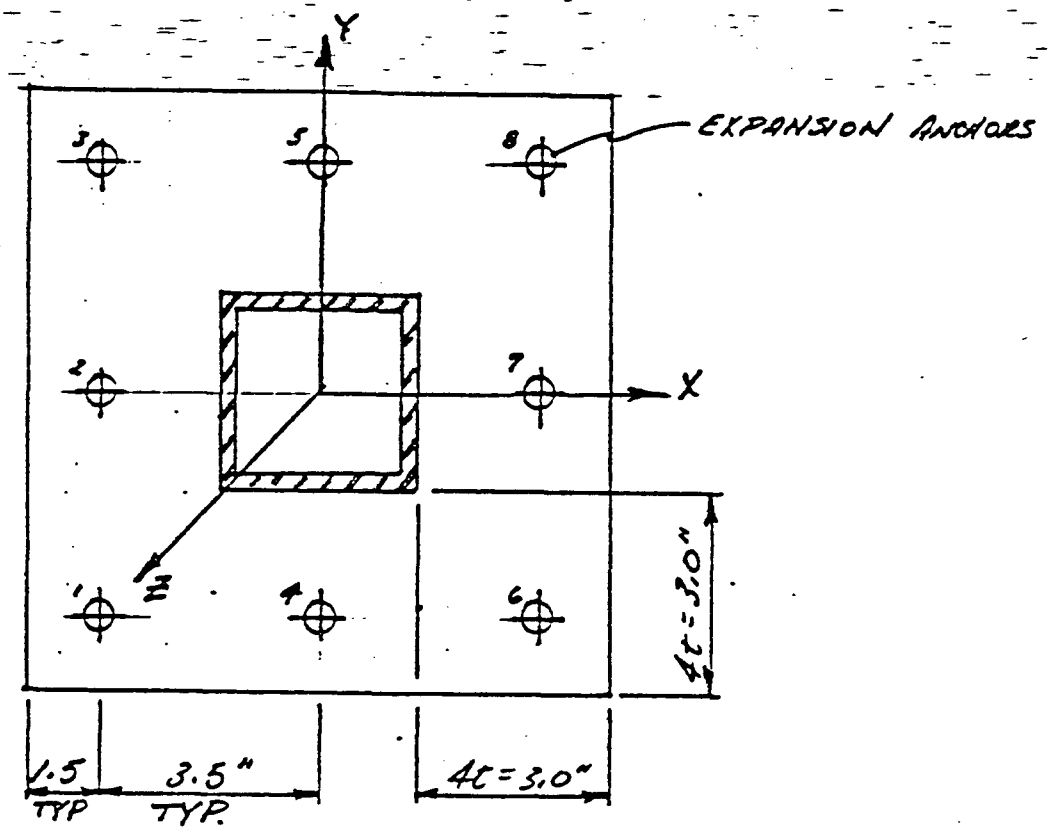
CHECKED SNL DATE 1/31/84

PLATE SIZE – 10" x 10" x 3/4"

K_z = 100 #/in
+ 300 #/in



LOADS: F_x = 0#
F_y = 0#
F_z = 20000#



SECTION A-A

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

DS-C1.7.1

COMPUTED TBR DATE 1/31/84

CHECKED PSL DATE 1/31/8

SUMMARY OF RESULTS FOR PLATE SIZE 10"X10"X 3/4"

ANCHOR LOADS

ANCHOR NUMBER	RIGID KIPS	FLEXIBLE, KIPS	
		K_f = 100 K/IN	K_f = 300 K/IN
1	2.5	2.39	2.19
2	2.5	2.61	2.81
3	2.5	2.39	2.19
4	2.5	2.62	2.82
5	2.5	2.62	2.82
6	2.5	2.39	2.18
7	2.5	2.61	2.81
8	2.5	2.39	2.18

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBR DATE 1/23/84

CHECKED [illegible] DATE 1/31/84

```
READY.
LIS

 84/01/29.  10:11:10.
PROGRAM   54P10

00100 1,4,UN,0
00110 3,9,NC,1.5
00120 10,10,1,1
00130 8
00140 SD,.75,1.5,1.5
00150 SD,.75,1.5,5.0
00160 SD,.75,1.5,8.5
00170 SD,.75,5.0,1.5
00180 SD,.75,5.0,8.5
00190 SD,.75,8.5,1.5
00200 SD,.75,8.5,5.0
00210 SD,.75,8.5,8.5
00220 4,4,5.0,5.0
00230 0,0,20,0,0,0
READY.
```

SHEET 28 OF 40

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBR DATE 1/23/84

CHECKED [illegible] DATE 1/31/84

[illegible]
LIS.F=CASDOUT
ILLEGAL COMMAND
LIS.F=CASDOUT

84/01/23. [illegible]
PROGRAM CASDOUT

WIDTH OF PLATE = 10 INCHES
LENGTH OF PLATE= 10 INCHES
MODULAR RATIO= 9

ANCHOR NUMBER	AREA IN	X ORDINATE IN	Y ORDINATE IN
1	.334	1.5	1.5
2	.334	1.5	5
3	.334	1.5	8.5
4	.334	5	1.5
5	.334	5	8.5
6	.334	8.5	1.5
7	.334	8.5	5
8	.334	8.5	8.5

LOAD CONDITION NUMBER= 1

ATTACHMENT 1
VERT LOAD= 20 KIPS LOCATION X= 5 INCHES Y= 5 INCHES
APPLIED MOMENT ABOUT Y AXIS= 0 KIP FEET
APPLIED MOMENT ABOUT X AXIS= 0 KIP FEET

SUMMATION OF APPLIED LOADS FOR 1 ATTACHMENT(S)= 20 KIP(S)
TRANSLATED MOMENT CENTERLINE ABOUT Y AXIS= 0 KIP FEET
TRANSLATED MOMENT CENTERLINE ABOUT X AXIS= 0 KIP FEET

UPLIFT CONDITION ON ANCHORS

ANCHOR NUMBER	STRESS KSI	TOTAL FORCE KIPS
1	7.49	2.5
2	7.49	2.5
3	7.49	2.5
4	7.49	2.5
5	7.49	2.5
6	7.49	2.5
7	7.49	2.5
8	7.49	2.5

READY.

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

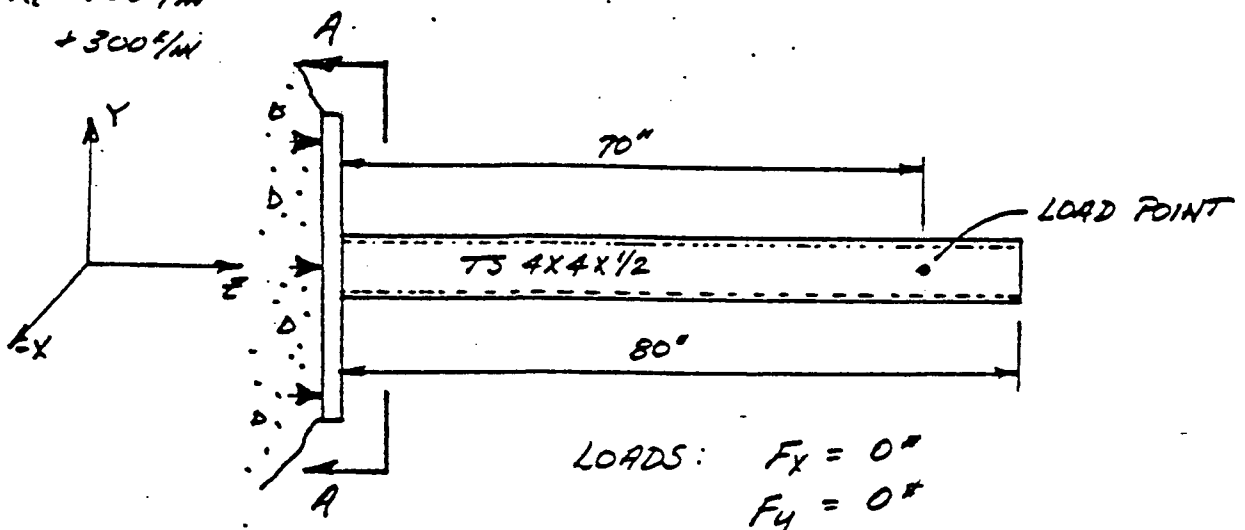
DS-C1.7.1

COMPUTED TBR DATE 1/31/84

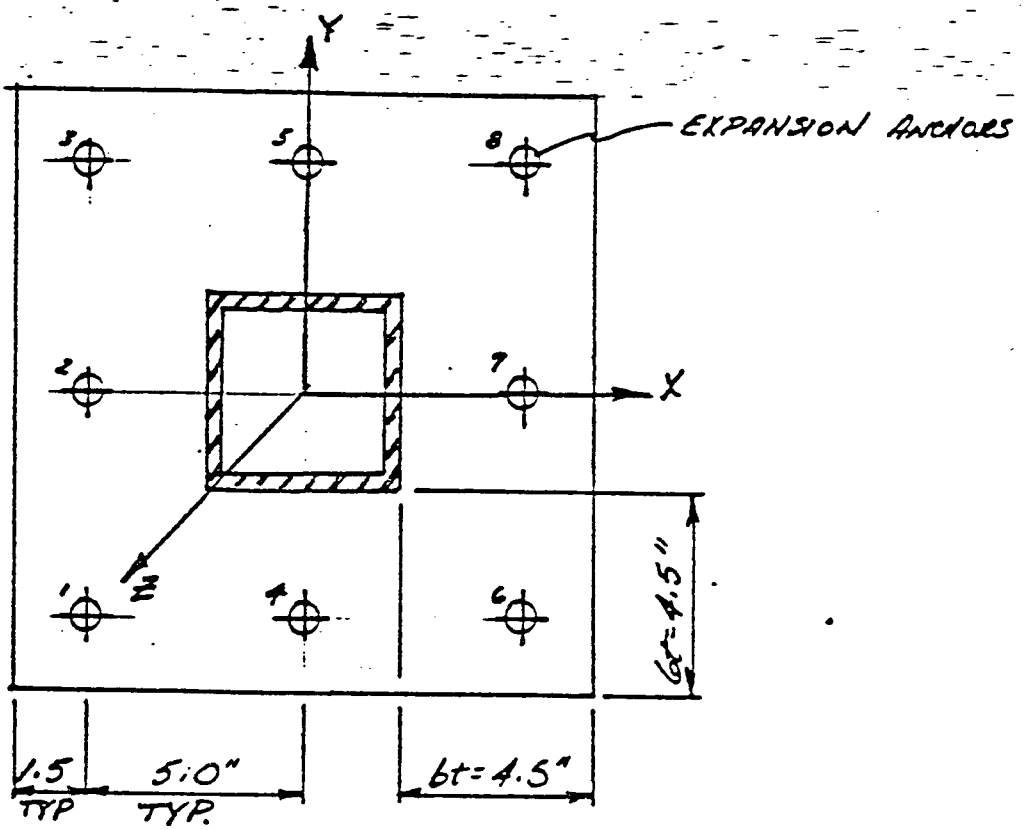
CHECKED [illegible] DATE 1/31/84

PLATE SIZE – 13" x 13" x 3/4"

K_t = 100 #/in
+300 #/in



LOADS: F_x = 0#
F_y = 0#
F_z = 23000#



SECTION A-A

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

DS-C1.7.1

COMPUTED TRR DATE 1/31/8
CHECKED [illegible] DATE 1/31/8

SUMMARY OF RESULTS
FOR PLATE SIZE 13"X13"X3/4"

ANCHOR NUMBER	ANCHOR LOADS RIGID KIPS	FLEXIBLE, KIPS $K_f = 100^K/_{IN}$	$K_f = 300^K/_{IN}$
1	2.88	2.40	1.91
2	2.88	3.35	4.02
3	2.88	2.40	1.91
4	2.88	3.35	4.03
5	2.88	3.35	4.03
6	2.88	2.40	1.91
7	2.88	3.35	4.02
8	2.88	2.40	1.91

SHEET 31 OF 40

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBR DATE 1/23/84

CHECKED [signature] DATE 1/31/84

```
JOB,BAP,3
READY.
LIOS
ILLEGAL COMMAND.
LIS

 84/01/23. 10.15.17.
PROGRAM   BAP10

00100 1,4,UN,0
00110 2,9,NC,1.5
00120 13,13,1,1
00130 8
00140 SD,.75,1.5,1.5
00150 SD,.75,1.5,6.5
00160 SD,.75,1.1,11.5
00170 SD,.75,6.5,1.5
00180 SD,.75,1.5,11.0
00190 SD,.75,11.5,1.5
00200 SD,.75,11.5,6.5
00210 SD,.75,11.5,11.5
00220 4,4,6.5,6.5
00230 0,0,23,0,0,0
READY.
```

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBR DATE 1/23/84
CHECKED [illegible] DATE 1/31/84

84/01/23. 10.16.16.
PROGRAM CASBO[illegible]

WIDTH OF PLATE = 13 INCHES
LENGTH OF PLATE= 13 INCHES
MODULAR RATIO= [illegible]

ANCHOR NUMBER	AREA IN	X ORDINATE IN	Y ORDINATE IN
1	.334	1.5	1.5
2	.334	1.5	6.5
3	.334	1.5	11.5
4	.334	6.5	1.5
5	.334	6.5	11.5
6	.334	11.5	1.5
7	.334	11.5	6.5
8	.334	11.5	11.5

LOAD CONDITION NUMBER= 1

ATTACHMENT 1
VERT LOAD= 23 KIPS   LOCATION X= 6.5 INCHES   Y= 6.5 INCHES
APPLIED MOMENT ABOUT Y AXIS= 0 KIP FEET
APPLIED MOMENT ABOUT X AXIS= 0 KIP-FEET

SUMMATION OF APPLIED LOADS FOR 1 ATTACHMENT(S)= 23 KIP(S)
TRANSLATED MOMENT CENTERLINE ABOUT Y AXIS= 0 KIP FEET
TRANSLATED MOMENT CENTERLINE ABOUT X AXIS= 0 KIP FEET

UPLIFT CONDITION ON ANCHORS

ANCHOR NUMBER	STRESS KSI	TOTAL FORCE KIPS
1	8.61	2.88
2	8.61	2.88
3	8.61	2.88
4	8.61	2.88
5	8.61	2.87
6	8.61	2.88
7	8.61	2.87
8	8.61	2.87

READY.

· EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

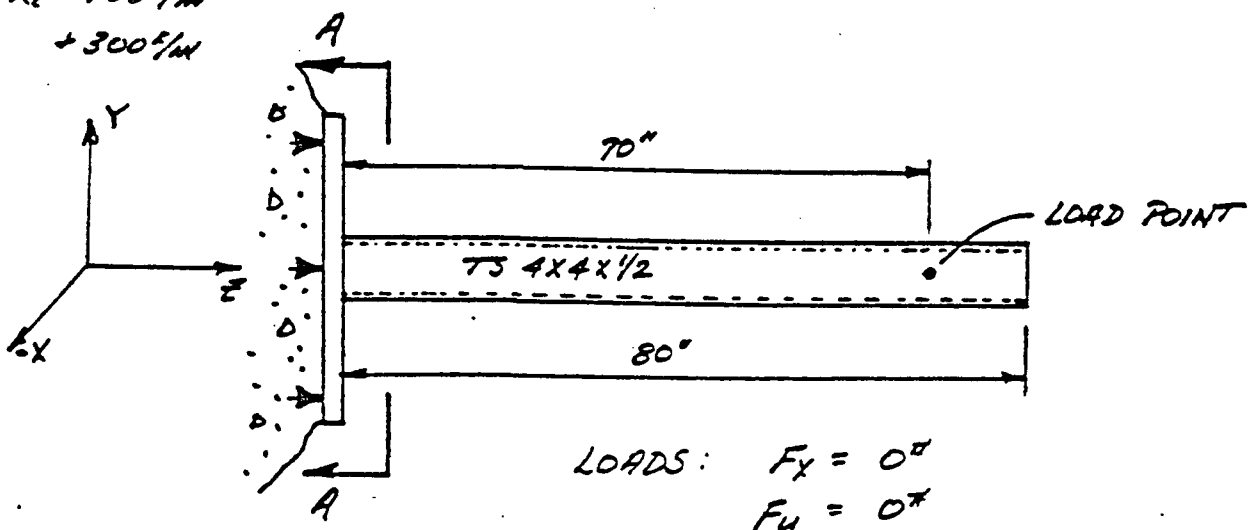
DS-C1.7.1

COMPUTED TBR DATE 1/31/84

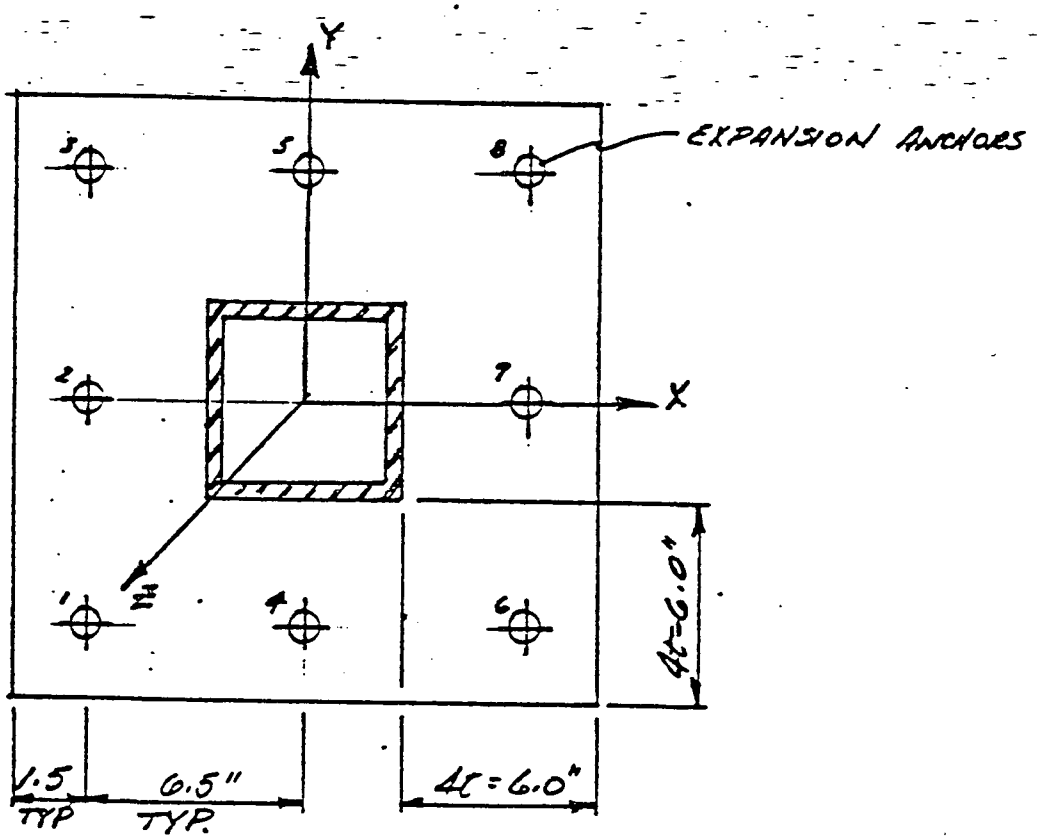
CHECKED GAL DATE 1/31/84

· PLATE SIZE – 16" x 16" x 1½"

K_t = 100 #/in
+ 300 #/in



LOADS: $F_X = 0^{\#}$
$F_Y = 0^{\#}$
$F_Z = 26{,}000^{\#}$



SECTION A-A

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

DS-C1.7.1

COMPUTED TBR DATE 1/31/84

CHECKED [illegible] DATE 1/31/84

SUMMARY OF RESULTS FOR PLATE SIZE 16"X16"X1½"

ANCHOR NUMBER	ANCHOR LOADS RIGID KIPS	FLEXIBLE, KIPS K_f = 100 K/in	FLEXIBLE, KIPS K_f = 300 K/in
1	3.25	3.08	2.77
2	3.25	3.42	3.73
3	3.25	3.08	2.77
4	3.25	3.43	3.74
5	3.25	3.43	3.74
6	3.25	3.08	2.76
7	3.25	3.42	3.73
8	3.25	3.08	2.76

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBR DATE 1/23/84

CHECKED [illegible] DATE 1/31/84

```
READY.
LIS

 84/01/23.  10.17.41.
PROGRAM    BAP16

00100 1,4,UN,0
00110 3,9,NC,1.5
00120 16,16,1,1
00130 8
00140 SD,.75,1.5,1.5
00150 SD,.75,1.5,8.0
00160 SD,.75,1.5,14.5
00170 SD,.75,8.0,1.5
00180 SD,.75,8.0,14.5
00190 SD,.75,14.5,1.5
00200 SD,.75,14.5,8.0
00210 SD,.75,14.5,14.5
00220 4,4,8.0,8.0
00230 0,0,26.0,0,0
READY.
```

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TSR DATE 1/23/84

CHECKED SH DATE 1/31/84

84/01/23. 10.1[illegible]8.
PROGRAM CASSOUT

WIDTH OF PLATE = 16 INCHES
LENGTH OF PLATE= 16 INCHES
MODULAR RATIO= 9

ANCHOR NUMBER	AREA IN	X ORDINATE IN	Y ORDINATE IN
1	.334	1.5	1.5
2	.334	1.5	8
3	.334	1.5	14.5
4	.334	8	1.5
5	.334	8	14.5
6	.334	14.5	1.5
7	.334	14.5	8
8	.334	14.5	14.5

LOAD CONDITION NUMBER= 1

ATTACHMENT 1
VERT LOAD= 26 KIPS LOCATION X= 8 INCHES Y= 8 INCHES
APPLIED MOMENT ABOUT Y AXIS= 0 KIP FEET
APPLIED MOMENT ABOUT X AXIS= 0 KIP FEET

SUMMATION OF APPLIED LOADS FOR 1 ATTACHMENT(S)= 26 KIP(S)
TRANSLATED MOMENT CENTERLINE ABOUT Y AXIS= 0 KIP FEET
TRANSLATED MOMENT CENTERLINE ABOUT X AXIS= 0 KIP FEET

UPLIFT CONDITION ON ANCHORS

ANCHOR NUMBER	STRESS KSI	TOTAL FORCE KIPS
1	9.73	3.25
2	9.73	3.25
3	9.73	3.25
4	9.73	3.25
5	9.73	3.25
6	9.73	3.25
7	9.73	3.25
8	9.73	3.25

READY.

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

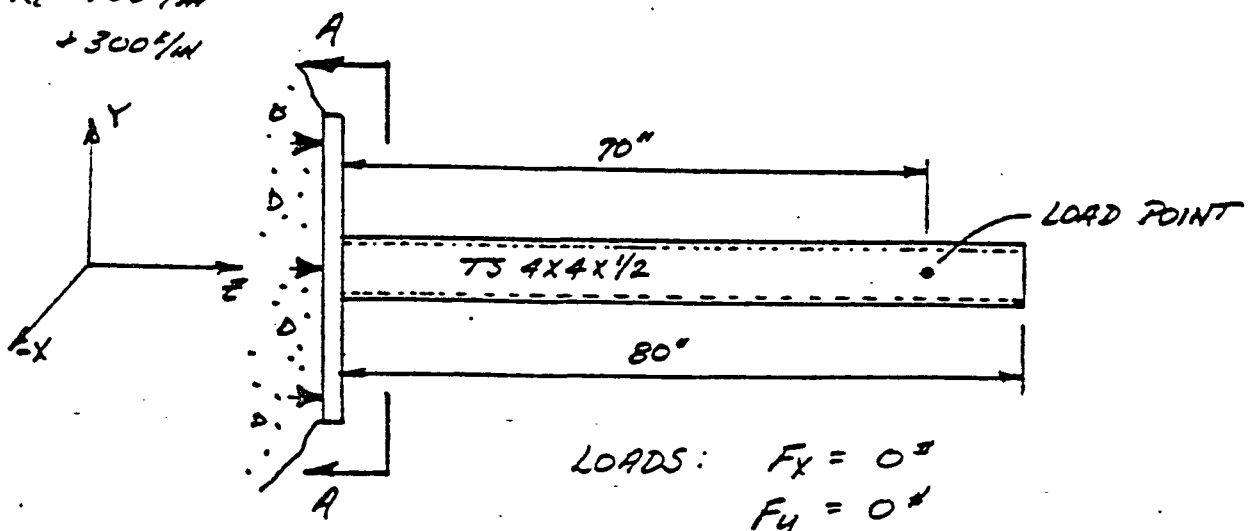
DS-C1.7.1

COMPUTED TBR DATE 1/31/8·

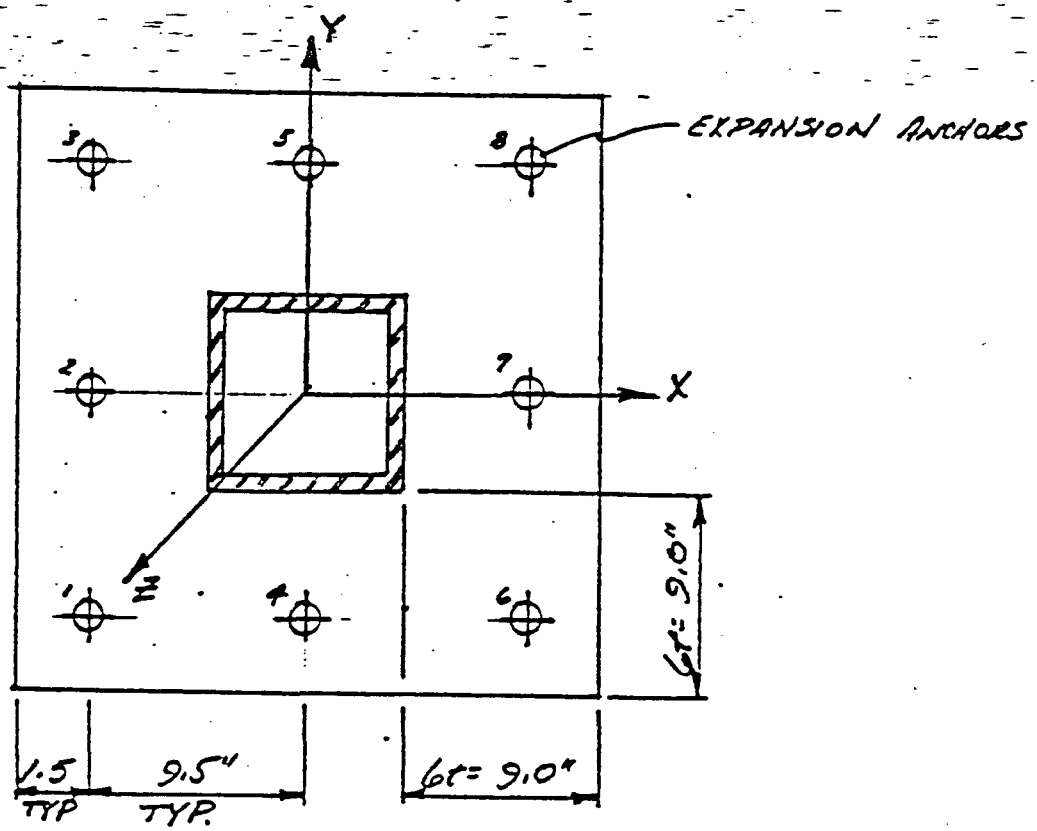
CHECKED PJM DATE 1/31/8·

PLATE SIZE – 22" x 22" x 1½"

k_t = 100 #/in
+ 300 #/in



LOADS: F_x = 0#
F_y = 0#
F_z = 30000#



SECTION A-A

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

DS-C1.7.1

COMPUTED TBL DATE 1/31/8

CHECKED PAL DATE 1/31/8

SUMMARY OF RESULTS
FOR PLATE SIZE 22"x22"x1½"

ANCHOR NUMBER	RIGID KIPS	FLEXIBLE, KIPS ANCHOR LOADS	
		K_f = 100 K/in	K_f = 300 K/in
1	3.75	3.25	2.47
2	3.75	4.25	5.02
3	3.75	3.25	2.47
4	3.75	4.26	5.03
5	3.75	4.26	5.03
6	3.75	3.25	2.47
7	3.75	4.25	5.03
8	3.75	3.25	2.47

EVALUATION OF BIKEPLATE RIGIDITY REQUIREMENTS

COMPUTED TOR DATE 1/23/84

CHECKED [illegible] DATE 1/31/84

```
OLD,BAP22
READY.
LIS

 84/01/23.  10.21.04.
PROGRAM   BAP22

00100 1,4,UN,0
00110 3,9,NC,1.5
00120 22,22,1,1
00130 3
00140 SD,.75,1.5,1.5
00150 SD,.75,1.5,11.0
00160 SD,.75,1.5,20.5
00170 SD,.75,11.0,1.5
00180 SD,.75,11.0,20.5
00190 SD,.75,20.5,1.5
00200 SD,.75,20.5,11.0
00210 SD,.75,20.5,20.5
00220 4,4,11.0,11.0
00230 0,0,30,0,0,0
READY.
```

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TDL DATE 1/23/84

CHECKED [illegible] DATE 1/31/84

84/01/23. 10.20.[illegible].
PROGRAM CASEOUT

WIDTH OF PLATE = 22 INCHES
LENGTH OF PLATE= 22 INCHES
MODULAR RATIO= 9

ANCHOR NUMBER	AREA IN	X ORDINATE IN	Y ORDINATE IN
1	.334	1.5	1.5
2	.334	1.5	11
3	.334	1.5	20.5
4	.334	11	1.5
5	.334	11	20.5
6	.334	20.5	1.5
7	.334	20.5	11
8	.334	20.5	20.5

LOAD CONDITION NUMBER= 1

ATTACHMENT 1
VERT LOAD= 30 KIPS LOCATION X= 11 INCHES Y= 11 INCHES
APPLIED MOMENT ABOUT Y AXIS= 0 KIP FEET
APPLIED MOMENT ABOUT X AXIS= 0 KIP FEET

SUMMATION OF APPLIED LOADS FOR 1 ATTACHMENT(S)= 30 KIP(S)
TRANSLATED MOMENT CENTERLINE ABOUT Y AXIS= 0 KIP FEET
TRANSLATED MOMENT CENTERLINE ABOUT X AXIS= 0 KIP FEET

UPLIFT CONDITION ON ANCHORS

ANCHOR NUMBER	STRESS KSI	TOTAL FORCE KIPS
1	11.23	3.75
2	11.23	3.75
3	11.23	3.75
4	11.23	3.75
5	11.23	3.75
6	11.23	3.75
7	11.23	3.75
8	11.23	3.75

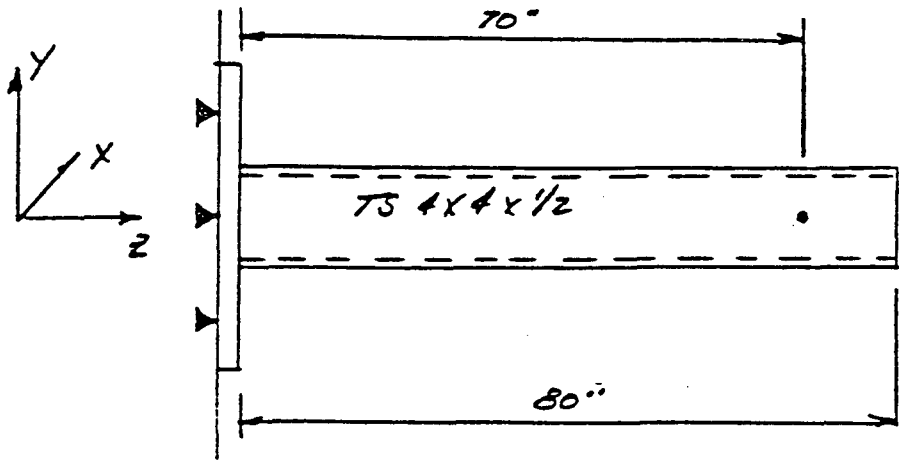
READY.

DS-C1.7.1

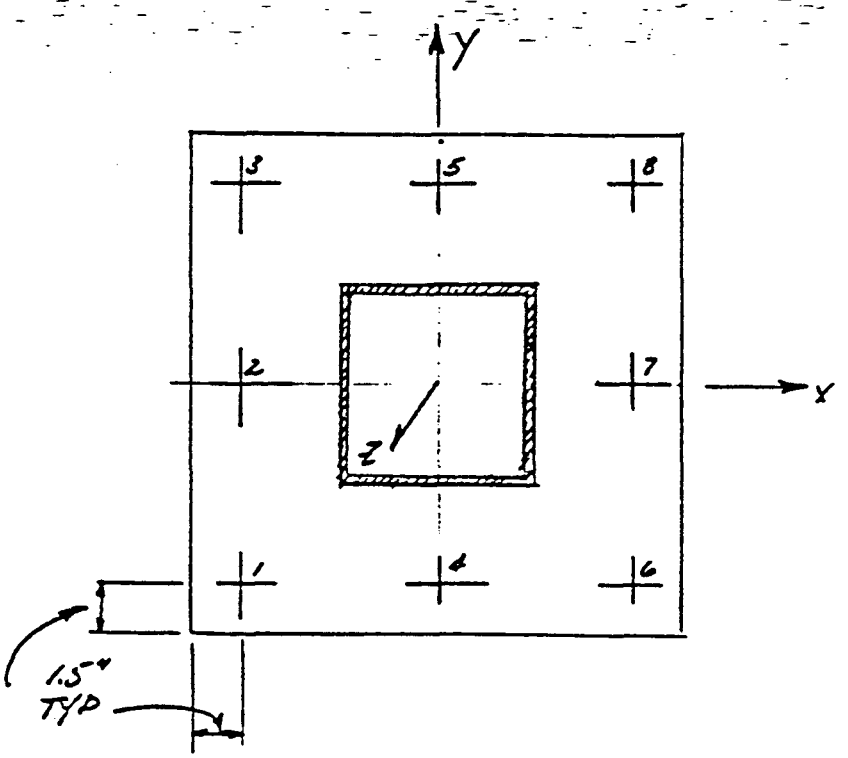
EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED BK DATE 7/19/8
CHECKED LS DATE 7-30-8

PLATE SIZE 10X10 X 3/4 W/ 8- 3/4" ϕ 550 ANCHORS LS.
K_L = 100 K/IN & 300 K/IN



LOADS
F_x = 1000 lb
F_y = -1000 lb
F_z = 1000 lb



TVA 11030 (WM-7-75)

85/07/19. 10.15.35.
PROGRAM CASDOUT

PROGRAM CASDBAP ID 262256 REV. 1 04/84

DATE = 85/07/19. TIME = 10.15.07.
FILE = BAP10

SHEET 108 OF 110
Baseplate Rigidity
PREPARED [illegible] DATE 7/12/85
CHECKED [illegible] DATE 7-30-85

ANCHORS TAKE NO COMPRESSION
WIDTH OF PLATE = 10 INCHES
LENGTH OF PLATE= 10 INCHES
MODULAR RATIO= 9

ANCHOR NUMBER	AREA IN	X ORDINATE IN	Y ORDINATE IN
1	.334	1.5	1.5
2	.334	1.5	5
3	.334	1.5	8.5
4	.334	5	1.5
5	.334	5	8.5
6	.334	8.5	1.5
7	.334	8.5	5
8	.334	8.5	8.5

LOAD CONDITION NUMBER= 1

ATTACHMENT 1
VERT LOAD= 1 KIPS LOCATION X= 5 INCHES Y= 5 INCHES
APPLIED MOMENT ABOUT Y AXIS= 5.83 KIP FEET
APPLIED MOMENT ABOUT X AXIS= 5.83 KIP FEET
.85

SUMMATION OF APPLIED LOADS FOR 1 ATTACHMENT(S)= 1 KIP(S)
TRANSLATED MOMENT CENTERLINE ABOUT Y AXIS= 5.83 KIP FEET
TRANSLATED MOMENT CENTERLINE ABOUT X AXIS= 5.83 KIP FEET

PARTIAL PRESSURE CASE

CONCRETE PRESSURE (KSI)
C2=-1.3711

CONCRETE PRESSURE FORCE,CF=-13.16 KIPS
LOCATION IN X-DIRECTION= 8.1 INCHES
LOCATION IN Y-DIRECTION= 1.9 INCHES

FRICTION SHEAR CAPACITY,SF= 6.58 KIPS

PRESSURE BULB GEOMETRY
Z3= 7.5876
Z6= 7.5876

ANCHOR NUMBER	STRESS GROSS AREA (KSI)	LOAD KIPS
1	3.9234	1.3104
[illegible]	9.6156	3.2116
[illegible]	15.3077	5.1128
5	9.6156	3.2116
8	3.9234	1.3104

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBL DATE 7/19/85
CHECKED LS DATE 7-30-85

SUMMARY OF RESULTS
FROM PLATE SIZE 10X10X3/4

ANCHOR NUMBER	ANCHOR LOADS: RIGID ANAL. KIPS	*FLEXIBLE ANALYSIS, KIPS: K=100 K/in	K=300 K/in
1	1.31	1.62	1.42
2	3.21	3.18	3.66
3	5.11	4.44	4.91
4	0	.38	0
5	3.21	3.18	3.66
6	0	0	0
7	0	.38	0
8	1.31	1.62	1.42

*For Flexible Analysis Plate Model see sht. 7 LL.

DS-C1.7.1

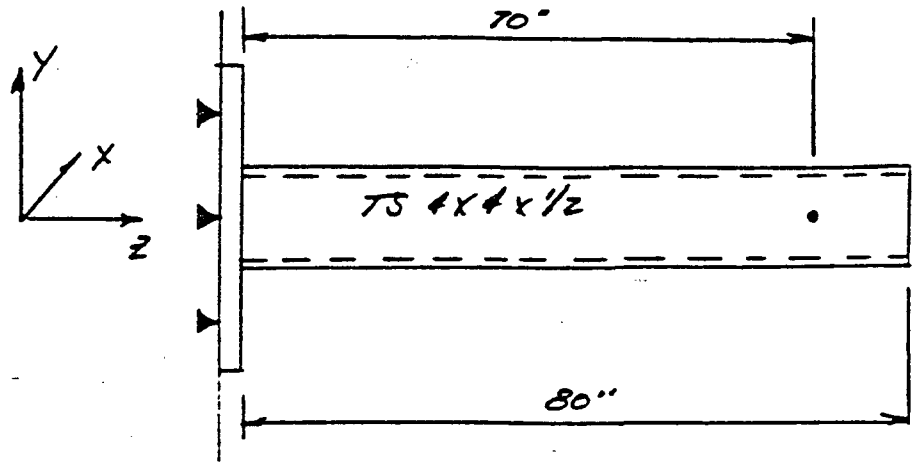
EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBK DATE 7/17/85

CHECKED LS DATE 7-30-85

PLATE SIZE 13 X 13 X 3/4 W/ 8- 3/4" ϕ 36D ANCHORS

K_L = 100 K/IN & 300 K/IN

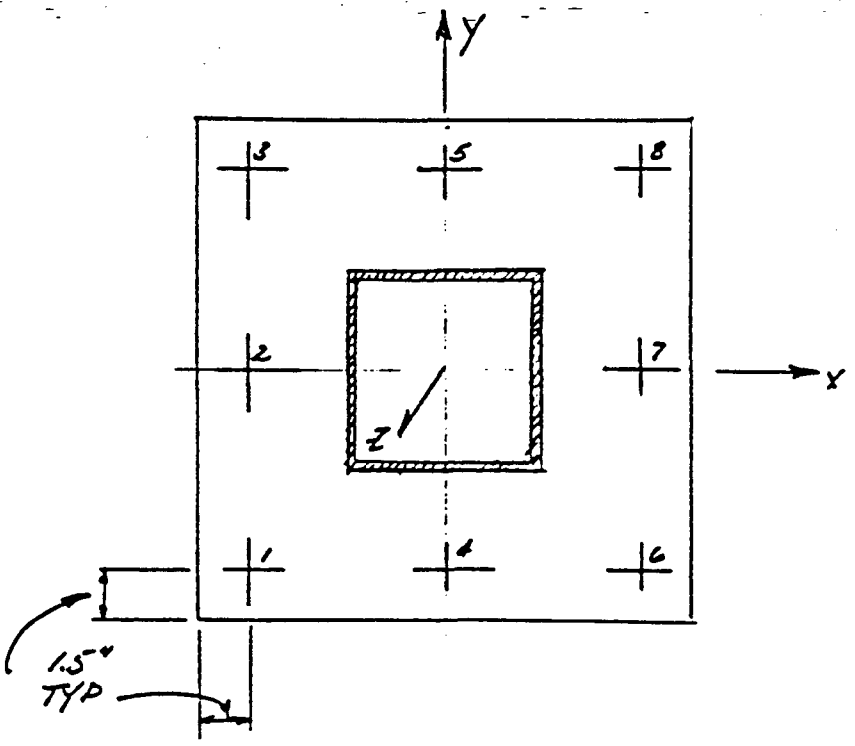


LOADS

F_X = 1000 lb

F_Y = -1000 lb

F_Z = 1000 lb



LIS.F=CASDOUT

85/07/19. 10.18.27.
PROGRAM CASDOUT

PROGRAM CASDBAP ID 262256 REV. 1 04/84

DATE = 85/07/19. TIME = 10.18.00.
FILE = BAP13

SHEET 40 OF 40
BASEPLATE RIGIDITY
PREPARED ZAE DATE 7/29/85
CHECKED LE DATE 7-30-85

ANCHORS TAKE NO COMPRESSION
WIDTH OF PLATE = 13 INCHES
LENGTH OF PLATE= 13 INCHES
MODULAR RATIO= 9

ANCHOR NUMBER	AREA IN	X ORDINATE IN	Y ORDINATE IN
1	.334	1.5	1.5
2	.334	1.5	6.5
3	.334	1.5	11.5
4	.334	6.5	1.5
5	.334	6.5	11.5
6	.334	11.5	1.5
7	.334	11.5	6.5
8	.334	11.5	11.5

LOAD CONDITION NUMBER= 1

ATTACHMENT 1
APPLIED LOAD= 1 KIPS LOCATION X= 6.5 INCHES Y= 6.5 INCHES
APPLIED MOMENT ABOUT Y AXIS= 5.83 KIP FEET
APPLIED MOMENT ABOUT X AXIS= 5.83 KIP FEET

SUMMATION OF APPLIED LOADS FOR 1 ATTACHMENT(S)= 1 KIP(S)
TRANSLATED MOMENT CENTERLINE ABOUT Y AXIS= 5.83 KIP FEET
TRANSLATED MOMENT CENTERLINE ABOUT X AXIS= 5.83 KIP FEET

PARTIAL PRESSURE CASE

CONCRETE PRESSURE (KSI)
C2=-.7333

CONCRETE PRESSURE FORCE, CF=-9.37 KIPS
LOCATION IN X-DIRECTION= 10.81 INCHES
LOCATION IN Y-DIRECTION= 2.19 INCHES

FRICTION SHEAR CAPACITY, SF= 4.69 KIPS

PRESSURE BULB GEOMETRY
Z3= 8.7574
Z6= 8.7574

ANCHOR NUMBER	STRESS GROSS AREA (KSI)	LOAD KIPS
[illegible]	3.1973	1.0679
	6.9653	2.3264
3	10.7333	3.5849
5	6.9653	2.3264
8	3.1973	1.0679

DS-C1.7.1

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBL DATE 7/19/85

CHECKED LS DATE 7-30-85

SUMMARY OF RESULTS FROM PLATE SIZE 13X13X3/4

ANCHOR NUMBER	ANCHOR LOADS RIGID ANAL. KIPS	*FLEXIBLE ANALYSIS, KIPS K=100 K/in	K=300 K/in
1	1.07	1.02	.80
2	2.33	2.85	3.61
3	3.58	3.53	3.35
4	0	.18	.07
5	2.33	2.85	3.61
6	0	0	0
7	0	.18	.07
8	1.07	1.02	.80

[* For Flexible Analysis (BASEPLT II) plate model see sheet 12. LD.]

DS-C1.7.1

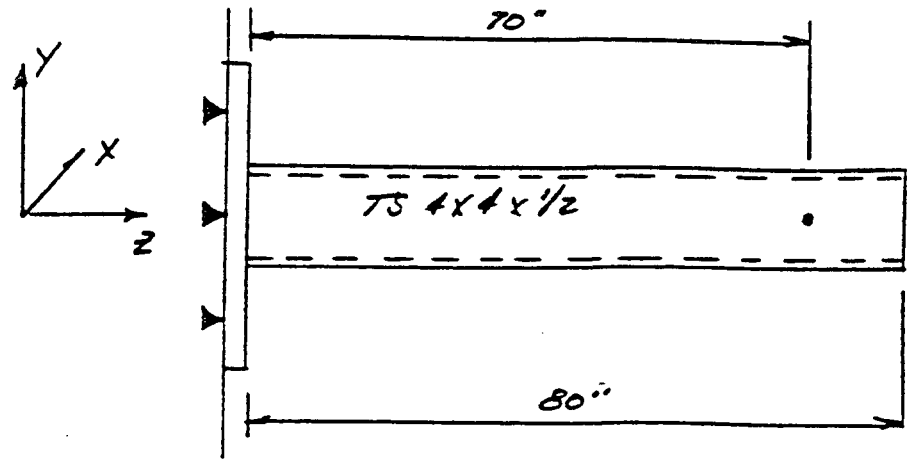
EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBC DATE 2/12/85

CHECKED LS DATE 7-30-85

PLATE SIZE 16 X 16 X 1 1/2 W/ 8 - 3/4 " ϕ SSD ANCHORS.

K_L = 100 K/IN + 300 K/IN

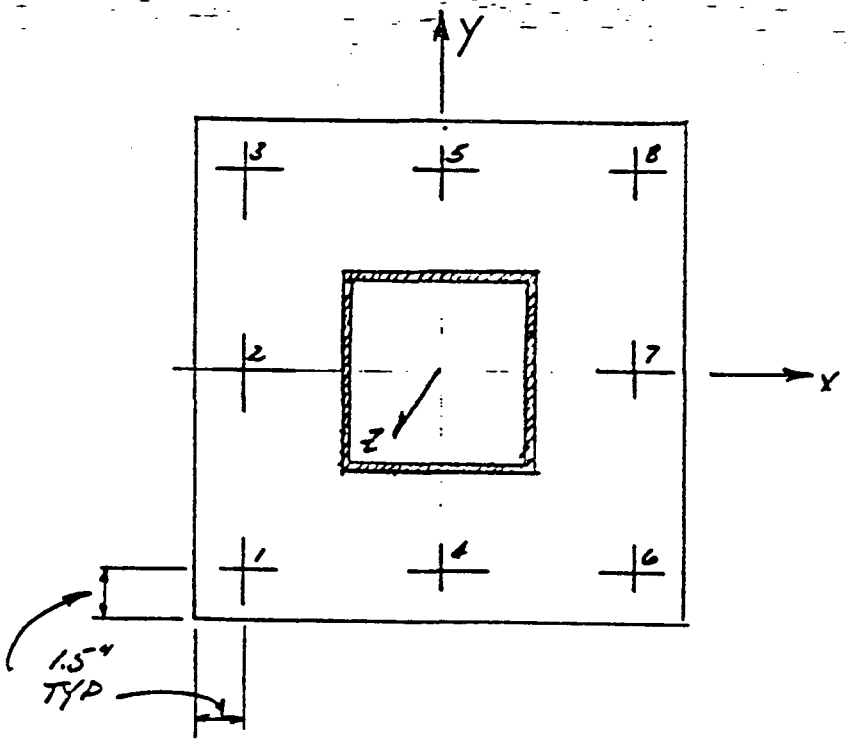


LOADS

F_X = 1000 lb

F_Y = -1000 lb

F_Z = 1000 lb



85/07/19. 10.20.50.
PROGRAM CASDOUT

PROGRAM CASDBAP ID 262256 REV. 1 04/84

DATE = 85/07/19. TIME = 10.20.22.

SHEET 40H OF 40
BASEPLATE PRIORITY
PREPARED TJC DATE 7/19/85
CHECKED GG DATE 7-30-85

ANCHORS TAKE NO COMPRESSION
WIDTH OF PLATE = 16 INCHES
LENGTH OF PLATE= 16 INCHES
MODULAR RATIO= 9

ANCHOR NUMBER	AREA IN	X ORDINATE IN	Y ORDINATE IN
1	.334	1.5	1.5
2	.334	1.5	8
3	.334	1.5	14.5
4	.334	8	1.5
5	.334	8	14.5
6	.334	14.5	1.5
7	.334	14.5	8
8	.334	14.5	14.5

LOAD CONDITION NUMBER= 1

ATTACHMENT 1
VERT LOAD= 1 KIPS LOCATION X= 8 INCHES Y= 8 INCHES
APPLIED MOMENT ABOUT Y AXIS= 5.83 KIP FEET
APPLIED MOMENT ABOUT X AXIS= 5.83 KIP FEET

SUMMATION OF APPLIED LOADS FOR 1 ATTACHMENT(S)= 1 KIP(S)
TRANSLATED MOMENT CENTERLINE ABOUT Y AXIS= 5.83 KIP FEET
TRANSLATED MOMENT CENTERLINE ABOUT X AXIS= 5.83 KIP FEET

PARTIAL PRESSURE CASE

CONCRETE PRESSURE (KSI)
C2=-.4601

CONCRETE PRESSURE FORCE,CF=-7.21 KIPS
LOCATION IN X-DIRECTION= 13.58 INCHES
LOCATION IN Y-DIRECTION= 2.42 INCHES

FRICTION SHEAR CAPACITY,SF= 3.6 KIPS

PRESSURE BULB GEOMETRY
Z3= 9.6943
Z6= 9.6943

ANCHOR NUMBER	STRESS GROSS AREA (KSI)	LOAD KIPS
1	2.6932	.8995
2	5.4695	1.8268
3	8.2457	2.7541
5	5.4695	1.8268
8	2.6932	.8995

DS-C1.7.1

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBL DATE 7/19/85

CHECKED LS DATE 7-30-85

SUMMARY OF RESULTS FROM PLATE SIZE 16 X 16 X 1 1/2

ANCHOR NUMBER	ANCHOR LOADS RIGID ANAL. KIPS	*FLEXIBLE ANALYSIS, KIPS K_1=100 K/in	K_1=300 K/in
1	.90	.84	.73
2	1.83	1.82	2.17
3	2.75	2.55	2.83
4	0	.16	0
5	1.83	1.82	2.17
6	0	0	0
7	0	.16	0
8	.90	.84	.73

* FOR FLEXIBLE ANALYSIS (BASEPLATE II) PLATE MODEL SEE SHEET 17.

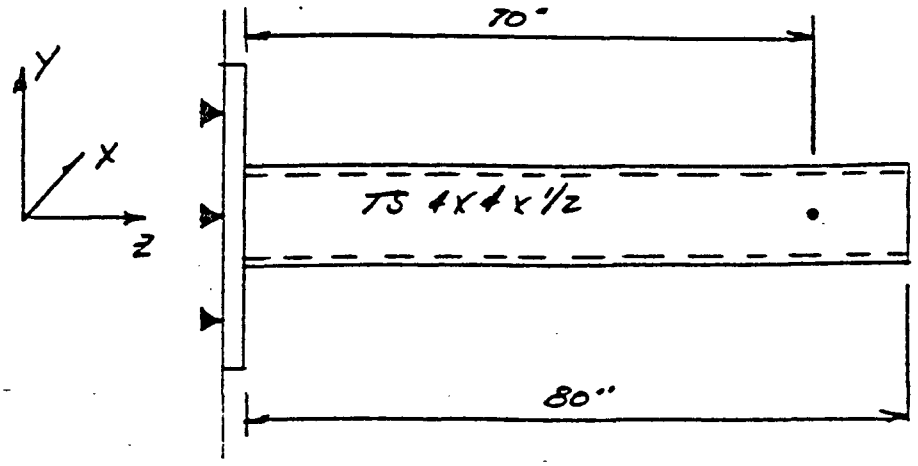
LS.

DS-C1.7.1

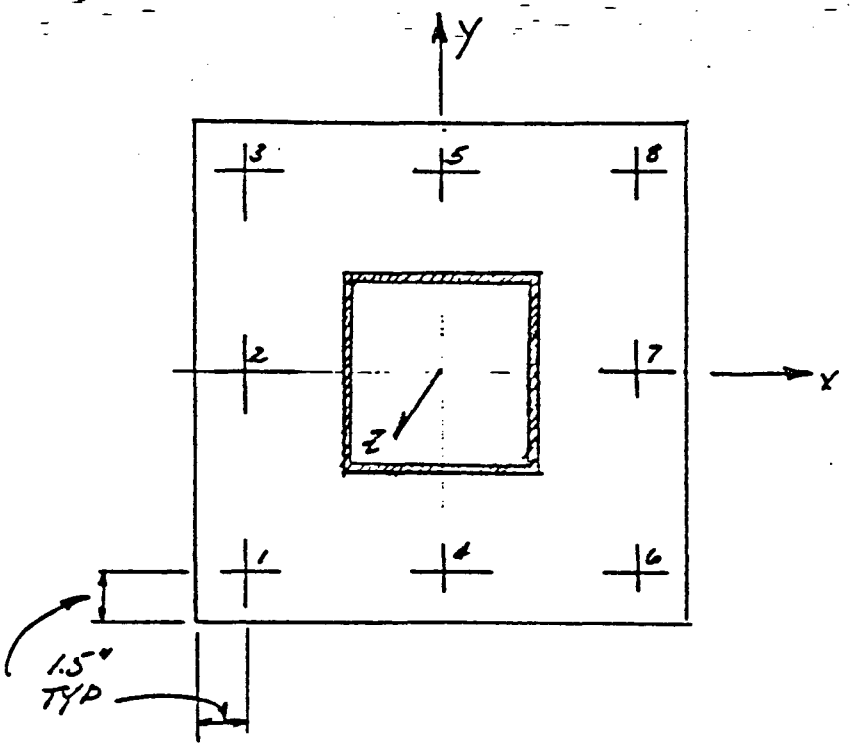
EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBL DATE 7/18/85
CHECKED LS DATE 7-30-85

PLATE SIZE 22X22X1½ W/8-¾" ϕ 350 ANCHORS.
K_L = 100 K/IN + 300 K/IN



LOADS
F_x = 1000 lb
F_y = -1000 lb
F_z = -1000 lb



TVA 11030 (WM-7-75)

85/07/19. 10.23.05.
PROGRAM CASDOUT

PROGRAM CASDBAP ID 262256 REV. 1 04/84

DATE = 85/07/19. TIME = 10.22.37.
FILE = BAP22

SHEET 40C OF 40
Baseplate Design
PREPARED ZBC DATE 2/12/85
CHECKED LS DATE 2-20-85

ANCHORS TAKE NO COMPRESSION
WIDTH OF PLATE = 22 INCHES
LENGTH OF PLATE= 22 INCHES
MODULAR RATIO= 9

ANCHOR NUMBER	AREA IN	X ORDINATE IN	Y ORDINATE IN
1	.334	1.5	1.5
2	.334	1.5	11
3	.334	1.5	20.5
4	.334	11	1.5
5	.334	11	20.5
6	.334	20.5	1.5
7	.334	20.5	11
8	.334	20.5	20.5

LOAD CONDITION NUMBER= 1

ATTACHMENT 1
VERT LOAD= 1 KIPS LOCATION X= 11 INCHES Y= 11 INCHES
APPLIED MOMENT ABOUT Y AXIS= 5.83 KIP FEET
APPLIED MOMENT ABOUT X AXIS= 5.83 KIP FEET

SUMMATION OF APPLIED LOADS FOR 1 ATTACHMENT(S)= 1 KIP(S)
TRANSLATED MOMENT CENTERLINE ABOUT Y AXIS= 5.83 KIP FEET
TRANSLATED MOMENT CENTERLINE ABOUT X AXIS= 5.83 KIP FEET

PARTIAL PRESSURE CASE

CONCRETE PRESSURE (KSI)
C2=-.2362

CONCRETE PRESSURE FORCE,CF=-4.97 KIPS
LOCATION IN X-DIRECTION= 19.19 INCHES
LOCATION IN Y-DIRECTION= 2.81 INCHES

FRICTION SHEAR CAPACITY,SF= 2.48 KIPS

PRESSURE BULB GEOMETRY
Z3=-11.2316
Z6= 11.2316

ANCHOR NUMBER	STRESS GROSS AREA (KSI)	LOAD KIPS
1	2.0378	.6806
2	3.8356	1.2811
3	5.6334	1.8816
4	.24	.0802
5	3.8356	1.2811
7	.24	.0802
8	2.0378	.6806

DS-C1.7.1

EVALUATION OF BASEPLATE RIGIDITY REQUIREMENTS

COMPUTED TBL DATE 7/19/85

CHECKED LD DATE 7-30-85

SUMMARY OF RESULTS FROM PLATE SIZE 22X22X1½

ANCHOR NUMBER	ANCHOR LOADS RIGID ANAL. KIPS	*FLEXIBLE ANALYSIS, KIPS K_1=100 K/in	K_1=300 K/in
1	.68	.52	.40
2	1.28	1.50	1.90
3	1.88	1.95	1.93
4	.08	.06	0
5	1.28	1.50	1.90
6	0	0	0
7	.08	.06	0
8	.68	.52	.40

* FOR FLEXIBLE ANALYSIS (BASE PLATE II) PLATE MODEL. SEE SHEET 22. LD.