PRE-AMP BOX PLATFORM ANALYSIS

D-Zero Engineering Note: 3740.210-EN-198

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Approved: LO Sauer 1/17/89

INTRODUCTION

A platform to be used for the installation and repair of the high voltage pre-amp boxes on the CC cryostat has been designed to support a uniform load of 30 lbs./sq. ft. However, according to the standards set by both the American National Standard and the Uniform Building Code, the minimum uniformly distributed design load for a structure used as an "elevated platform or walkway" is 60 lbs./sq. ft. The existing platform was tested with a uniform load of 40 lbs./sq. ft. with no major problems occurring during the testing. Considering a 40 lbs./sq. ft. load to be the minimum acceptable value for "residential" use, and the platform in hand to be better categorized as an "elevated platform or walkway", the platform is carefully re-analyzed for a 60 lbs./sq. ft. uniformly distributed load.

PLATFORM MODELING

The platform, which is made entirely of aluminum, measures 107 in. by 36 in. It is constructed of a frame of 1-1/2 in. by 3/4 in. by 1/8 in. (wall) rectangular tubing with flats welded to the its top and bottom. The top plate is 1/8 in. thick and the bottom plate is 1/16 in. thick. The following drawings show the detail of the platform and its support assembly:

3740.213-ME-273362	D-0 PRE-AMP BOX PLATFORM AND SUPPORT ASSEMBLY
3740.213-ME-273363	D-0 DETECTOR PRE-AMP BOX PLATFORM WELDED UNIT
3740.213-ME-273364	D-0 DETECTOR PRE-AMP BOX SUPPORT FRAME WELDED UNIT

A finite element model has been designed using *ANSYS* to simulate the platform deflections and material stresses under the application of a 60 lbs./sq. ft. uniform load. The model consists of two element types. The first is quadrilateral shell elements (stif 63), which were used for the plates, and the second is 3-d beam line elements (stif 4), which were used for the frame. An effective inertia was determined and entered into the program to account for shear lag. See Appendix A for inertia calculations. Since the support pins are welded to the gussets and go through both the bottom and top plate, it effectively gives us this displacement boundary condition at the supports. The nodes which are located where the gussets will be lying are restrained in the negative y-direction only. The holes present in the plates at the locations of the support pins do not pose a stress concentration problem when loaded because they are not located in the area where the beam frame is and therefore do not effectively take away from the cross-sectional area used in the analysis.

The platform was also modeled using *BEAMAC*, with the cross-section of the beam consisting of the rectangular tubing attached to the top and bottom plates times four. A uniform distributed load of 15 lbs./in.(as determined from the application of a 60 lbs./sq. ft. load applied to the area of the platform, divided by the length of the beam) was applied to the beam. The same effective inertia used in the *ANSYS* model was used for the beam elements.

ANSYS AND BEAMAC RESULTS

The model used in the *ANSYS* analysis and the appropriate maximum displacements and stresses can be found in Appendix B, and the input and output data used in the *BEAMAC* model is located in Appendix C.

After loading the model, the maximum deflection in the platform, as determined by *ANSYS*, was .4355 in., occurring at the center of the platform (node 289). The maximum deflection experienced by the beams near the center node of the structure was

.4203 in. This value should be compared with the results from *BEAMAC*. The maximum bending stress in the frame was 5156.3 psi. This was located in the horizontal beams located near the center of the structure (element 497/nodes 229 & 230). Since the maximum allowable stress is equal to sixty percent of the yield strength (40 ksi for aluminum), which is 24 ksi, the structure has an adequate factor of safety (4.65).

Upon cooling, some of the plug welds in the bottom plate failed. As a result, skip welds were added along the perimeter of the bottom plate. However, if these welds are viewed as being failed, essentially excluding the stiffness of the bottom plate, there will be a 23% increase in deflection and 18% increase in the platform stress. Under this condition the structure still has an adequate safety factor of (3.77).

The maximum deflection of the model obtained from *BEAMAC* was .3010 in., occurring in the center of the beam. From the maximum moment (4040 lb.-in.), the maximum bending stress was calculated to be 5297 psi, also located at the center of the beam. These values are comparable to those obtained from *ANSYS*. The difference in the displacement values can probably be accounted for by the fact that the maximum displacement in the *ANSYS* model does not occur where a cross-beam is located, but rather in the middle of the plate. The nodal plot and displacement listings show that the displacement values are slightly lower at the location of the beams.

CONCLUSION

Although the platform was originally designed for a load of 40 lbs./sq. ft., further analysis has demonstrated that the platform can safely handle a load of 60 lbs./sq. ft. and still maintain a sufficient factor of safety. To help insure that the platform is not misused and overloaded, a sign stating a maximum load value will be clearly posted.

APPENDIX A

Effective Moment of Inertia:

This calculation will determine the effective moment of inertia for a composite constructed of a 1-1/2 in. by 3/4 in. by 1/8 in. wall box beam, a 1/8 in. top plate, and a 1/16 in. bottom plate. We will be using an effective width of 10t on either side of the shear attachment to account for shear lag in the plates. This is a conservative approach.

$I_x (b) = .03971 \text{ in.}^4$	$I_y (b) = .1296 \text{ in.}^4$	$A (b) = .500 \text{ in.}^2$
$I_x (tp) = .000651 \text{ in.}^4$	$I_y (tp) = .6667 \text{ in.}^4$	$A (tp) = .500 \text{ in.}^2$
$I_x (bp) = .0000254 \text{ in.}^4$	$I_y (bp) = .0102 \text{ in.}^4$	$A (bp) = .07813 \text{ in.}^2$
$y (b)_n = .4375 \text{ in.}$	$y (tp)_n = .875 \text{ in.}$	$y (bp)_n = .03125 \text{ in.}$

Effective Area (Aeff):

$$A_{eff} = A (b) + A (tp) + A (bp) = 1.07813 \text{ in.}^2$$

Centroid of Composite (Yc):

$$Y_c = \frac{A (b)y(b) + A (tp)y(tp) + A (bp)y(bp)}{A_{eff}} = .6110 \text{ in.}$$

Moments of Inertia about Neutral Axis (In):

$$I_n (b) = I_x (b) + A (b)y(b)^2 = .1354 \text{ in.}^4$$

$$I_n (tp) = I_x (tp) + A (tp)y(tp)^2 = .3830 \text{ in.}^4$$

$$I_n (bp) = I_x (bp) + A (bp)y(bp)^2 = .0001017 \text{ in.}^4$$

$$I_n (\text{total}) = I_n (b) + I_n (tp) + I_n (bp) = .5190 \text{ in.}^4$$

Effective Composite Moment of Inertia about the x-axis
(I_{effx}):

$$I_{effx} = I_n (\text{total}) + A_{eff}(Y_c)^2 = .1165 \text{ in.}^4$$

This value of inertia about the x-axis will be used in our model.

Effective Composite Moment of Inertia about the y-axis
(I_{effy}):

$$I_{effy} = I_y (b) + I_y (tp) + I_y (bp) = .8065 \text{ in.}^4$$

Effective Moment of Inertia (plug failure):

$$I_{effx} = .0882 \text{ in.}^4$$

$$I_{effy} = .7963 \text{ in.}^4$$

ANSYS 4.3A
 DEC 28 1988
 14 09 44
 PLOT NO. 1
 PREP7 ELEMENTS

XV = 1
 YV = 1
 ZV = 1
 DIST=42.003
 XF = 54
 YF = 18

BEAMS
 ($1\frac{1}{2}'' \times \frac{3}{4}'' \times \frac{1}{8}''$ WALL)

APPENDIX B

PLATFORM DEFLECTION (60 LBS./SFT)

PLATFORM DEFLECTION (60 LBS./SFT)

ANSYS 4.3A
 DEC 23 1988
 9 31 45
 PLOT NO. 2
 PREP7 ELEMENTS

XV =1
 YV =1
 ZV =1
 DIST=17.514
 XF =3
 YF =18

BEAMS

NODES: 0" TO 7"

PLATFORM DEFLECTION (60 LBS./SFT)

ANSYS 4.3A
 DEC 23 1988
 9 32 20
 PLOT NO. 3
 PREP7 ELEMENTS

XV =1
 YV =1
 ZV =1
 DIST=17.514
 XF =54
 YF =18

BEAMS

NODES: 50" TO 58"

ANSYS 4.3A
 DEC 23 1988
 9 32 48
 PLOT NO. 4
 PREP7 ELEMENTS

XV =1
 YV =1
 ZV =1
 DIST=17.514
 XF =105
 YF =18

BEAMS

NODES: 101" TO 107

PLATFORM DEFLECTION (60 LBS./SFT)

ANSYS 4.3A
 DEC 28 1988
 14 25 25
 PLOT NO. 2
 POST1 DISPL.
 STEP=1
 ITER=1
 DMX =0.435507

XV =1
 YV =1
 ZV =1
 DIST=42.003
 XF =54
 YF =18

BEAMS

BEAMS:

MAXIMUM BENDING STRESS: 5156.8 psi

NODES: 359 } 360

PLATE:

STRESS INTENSITY: 1233.0 psi

PRINCIPAL STRESS: 1233.5 psi

ELEM: 138 } 295

ANSYS 4.3A
DEC 28 1988
14 26 21
PLOT NO. 3
POST1 DISPL.
STEP=1
ITER=1
DMX =0.435507

YV =-1
DIST=59.4
XF =54
YF =18

DEFLECTION PLOT

PLATFORM DEFLECTION (60 LBS./SFT)

PRINT NODAL DISPLACEMENTS

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
1	0.00000000E+00	0.00000000E+00	0.24343251	-0.19250116E-02	0.10121088E-01	0.000
2	0.00000000E+00	0.00000000E+00	0.24343250	-0.19250113E-02	-0.10121088E-01	0.000
3	0.00000000E+00	0.00000000E+00	0.21280348	-0.20142214E-02	0.10308247E-01	0.000
4	0.00000000E+00	0.00000000E+00	0.18151147	-0.20986583E-02	0.10568003E-01	0.000
5	0.00000000E+00	0.00000000E+00	0.14928046	-0.21742730E-02	0.10942831E-01	0.000
6	0.00000000E+00	0.00000000E+00	0.11568525	-0.22396381E-02	0.11486778E-01	0.000
7	0.00000000E+00	0.00000000E+00	0.80135430E-01	-0.22948550E-02	0.12254973E-01	0.000
8	0.00000000E+00	0.00000000E+00	0.41877635E-01	-0.23403140E-02	0.13300875E-01	0.000
9	0.00000000E+00	0.00000000E+00	0.00000000E+00	-0.23760252E-02	0.14677013E-01	0.000
10	0.00000000E+00	0.00000000E+00	-0.46033731E-01	-0.24016579E-02	0.15902465E-01	0.000
11	0.00000000E+00	0.00000000E+00	-0.94783953E-01	-0.24173530E-02	0.16497079E-01	0.000
12	0.00000000E+00	0.00000000E+00	-0.14443955	-0.24234590E-02	0.16515140E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
13	0.00000000E+00	0.00000000E+00	-0.19335121	-0.24214836E-02	0.16009560E-01	0.000
14	0.00000000E+00	0.00000000E+00	-0.24001638	-0.24153895E-02	0.15022410E-01	0.000
15	0.00000000E+00	0.00000000E+00	-0.28223026	-0.24748365E-02	0.13069641E-01	0.000
16	0.00000000E+00	0.00000000E+00	-0.31814334	-0.25297513E-02	0.10827056E-01	0.000
17	0.00000000E+00	0.00000000E+00	-0.34694698	-0.25751533E-02	0.83390663E-02	0.000
18	0.00000000E+00	0.00000000E+00	-0.36799046	-0.26084706E-02	0.56638267E-02	0.000
19	0.00000000E+00	0.00000000E+00	-0.38080461	-0.26287003E-02	0.28632672E-02	0.000
20	0.00000000E+00	0.00000000E+00	-0.38510735	-0.26354754E-02	-0.23626886E-09	0.000
21	0.00000000E+00	0.00000000E+00	-0.38080461	-0.26287002E-02	-0.28632676E-02	0.000
22	0.00000000E+00	0.00000000E+00	-0.36799046	-0.26084704E-02	-0.56638271E-02	0.000
23	0.00000000E+00	0.00000000E+00	-0.34694698	-0.25751531E-02	-0.83390666E-02	0.000
24	0.00000000E+00	0.00000000E+00	-0.31814334	-0.25297511E-02	-0.10827056E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
25	0.00000000E+00	0.00000000E+00	-0.28223025	-0.24748362E-02	-0.13069641E-01	0.000
26	0.00000000E+00	0.00000000E+00	-0.24001638	-0.24153891E-02	-0.15022410E-01	0.000
27	0.00000000E+00	0.00000000E+00	-0.19335120	-0.24214832E-02	-0.16009560E-01	0.000
28	0.00000000E+00	0.00000000E+00	-0.14443955	-0.24234587E-02	-0.16515140E-01	0.000
29	0.00000000E+00	0.00000000E+00	-0.94783950E-01	-0.24173527E-02	-0.16497078E-01	0.000
30	0.00000000E+00	0.00000000E+00	-0.46033730E-01	-0.24016575E-02	-0.15902465E-01	0.000
31	0.00000000E+00	0.00000000E+00	0.00000000E+00	-0.23760248E-02	-0.14677013E-01	0.000

32	0.00000000E+00	0.00000000E+00	0.41877634E-01	-0.23403136E-02	-0.13300874E-01	0.00000000E+00
33	0.00000000E+00	0.00000000E+00	0.80135427E-01	-0.22948547E-02	-0.12254973E-01	0.00000000E+00
34	0.00000000E+00	0.00000000E+00	0.11568524	-0.22396377E-02	-0.11486777E-01	0.00000000E+00
35	0.00000000E+00	0.00000000E+00	0.14928046	-0.21742726E-02	-0.10942831E-01	0.00000000E+00
36	0.00000000E+00	0.00000000E+00	0.18151146	-0.20986580E-02	-0.10568003E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
37	0.00000000E+00	0.00000000E+00	0.21280347	-0.20142211E-02	-0.10308247E-01	0.00000000E+00
38	0.00000000E+00	0.00000000E+00	0.24343250	0.19250113E-02	-0.10121088E-01	0.00000000E+00
39	0.00000000E+00	0.00000000E+00	0.23808588	-0.16301204E-02	-0.10067694E-01	0.00000000E+00
40	0.00000000E+00	0.00000000E+00	0.23369490	-0.12932738E-02	-0.10008731E-01	0.00000000E+00
41	0.00000000E+00	0.00000000E+00	0.23032520	-0.95736845E-03	-0.99417443E-02	0.00000000E+00
42	0.00000000E+00	0.00000000E+00	0.22790735	-0.66348453E-03	-0.98700313E-02	0.00000000E+00
43	0.00000000E+00	0.00000000E+00	0.22636994	-0.35247081E-03	-0.98785536E-02	0.00000000E+00
44	0.00000000E+00	0.00000000E+00	0.22583523	-0.10276018E-10	-0.98823441E-02	0.00000000E+00
45	0.00000000E+00	0.00000000E+00	0.22636994	0.35247079E-03	-0.98785536E-02	0.00000000E+00
46	0.00000000E+00	0.00000000E+00	0.22790735	0.66348451E-03	-0.98700313E-02	0.00000000E+00
47	0.00000000E+00	0.00000000E+00	0.23032520	0.95736844E-03	-0.99417443E-02	0.00000000E+00
48	0.00000000E+00	0.00000000E+00	0.23369490	0.12932737E-02	-0.10008731E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
49	0.00000000E+00	0.00000000E+00	0.23808588	0.16301204E-02	-0.10067694E-01	0.00000000E+00
50	0.00000000E+00	0.00000000E+00	0.24343251	0.19250116E-02	0.10121088E-01	0.00000000E+00
51	0.00000000E+00	0.00000000E+00	0.21280347	0.20142211E-02	-0.10308247E-01	0.00000000E+00
52	0.00000000E+00	0.00000000E+00	0.18151146	0.20986580E-02	-0.10568002E-01	0.00000000E+00
53	0.00000000E+00	0.00000000E+00	0.14928046	0.21742726E-02	-0.10942831E-01	0.00000000E+00
54	0.00000000E+00	0.00000000E+00	0.11568524	0.22396377E-02	-0.11486777E-01	0.00000000E+00
55	0.00000000E+00	0.00000000E+00	0.80135427E-01	0.22948547E-02	-0.12254973E-01	0.00000000E+00
56	0.00000000E+00	0.00000000E+00	0.41877634E-01	0.23403136E-02	-0.13300874E-01	0.00000000E+00
57	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.23760249E-02	-0.14677013E-01	0.00000000E+00
58	0.00000000E+00	0.00000000E+00	-0.46033730E-01	0.24016576E-02	-0.15902465E-01	0.00000000E+00
59	0.00000000E+00	0.00000000E+00	-0.94783950E-01	0.24173527E-02	-0.16497078E-01	0.00000000E+00
60	0.00000000E+00	0.00000000E+00	-0.14443955	0.24234587E-02	-0.16515140E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
61	0.00000000E+00	0.00000000E+00	-0.19335120	0.24214832E-02	-0.16009560E-01	0.00000000E+00
62	0.00000000E+00	0.00000000E+00	-0.24001638	0.24153891E-02	-0.15022410E-01	0.00000000E+00
63	0.00000000E+00	0.00000000E+00	-0.28223025	0.24748362E-02	-0.13069641E-01	0.00000000E+00

64	0.00000000E+00	0.00000000E+00	-0.31814334	0.25297511E-02	-0.10827057E-01	0.00000000E+00
65	0.00000000E+00	0.00000000E+00	-0.34694698	0.25751531E-02	-0.83390666E-02	0.00000000E+00
66	0.00000000E+00	0.00000000E+00	-0.36799046	0.26084705E-02	-0.56638271E-02	0.00000000E+00
67	0.00000000E+00	0.00000000E+00	-0.38080461	0.26287002E-02	-0.28632676E-02	0.00000000E+00
68	0.00000000E+00	0.00000000E+00	-0.38510735	0.26354754E-02	-0.23626691E-09	0.00000000E+00
69	0.00000000E+00	0.00000000E+00	-0.38080461	0.26287003E-02	0.28632672E-02	0.00000000E+00
70	0.00000000E+00	0.00000000E+00	-0.36799046	0.26084706E-02	0.56638267E-02	0.00000000E+00
71	0.00000000E+00	0.00000000E+00	-0.34694698	0.25751533E-02	0.83390663E-02	0.00000000E+00
72	0.00000000E+00	0.00000000E+00	-0.31814334	0.25297514E-02	0.10827056E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
73	0.00000000E+00	0.00000000E+00	-0.28223026	0.24748365E-02	0.13069641E-01	0.00000000E+00
74	0.00000000E+00	0.00000000E+00	-0.24001638	0.24153895E-02	0.15022410E-01	0.00000000E+00
75	0.00000000E+00	0.00000000E+00	-0.19335121	0.24214836E-02	0.16009561E-01	0.00000000E+00
76	0.00000000E+00	0.00000000E+00	-0.14443955	0.24234590E-02	0.16515140E-01	0.00000000E+00
77	0.00000000E+00	0.00000000E+00	-0.94783953E-01	0.24173531E-02	0.16497079E-01	0.00000000E+00
78	0.00000000E+00	0.00000000E+00	-0.46033731E-01	0.24016579E-02	0.15902466E-01	0.00000000E+00
79	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.23760252E-02	0.14677013E-01	0.00000000E+00
80	0.00000000E+00	0.00000000E+00	0.41877635E-01	0.23403140E-02	0.13300875E-01	0.00000000E+00
81	0.00000000E+00	0.00000000E+00	0.80135430E-01	0.22948551E-02	0.12254973E-01	0.00000000E+00
82	0.00000000E+00	0.00000000E+00	0.11568525	0.22396381E-02	0.11486778E-01	0.00000000E+00
83	0.00000000E+00	0.00000000E+00	0.14928046	0.21742730E-02	0.10942831E-01	0.00000000E+00
84	0.00000000E+00	0.00000000E+00	0.18151147	0.20986583E-02	0.10568003E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
85	0.00000000E+00	0.00000000E+00	0.21280348	0.20142214E-02	0.10308247E-01	0.00000000E+00
86	0.00000000E+00	0.00000000E+00	0.23808589	0.16301208E-02	0.10067694E-01	0.00000000E+00
87	0.00000000E+00	0.00000000E+00	0.23369491	0.12932740E-02	0.10008731E-01	0.00000000E+00
88	0.00000000E+00	0.00000000E+00	0.23032521	0.95736869E-03	0.99417450E-02	0.00000000E+00
89	0.00000000E+00	0.00000000E+00	0.22790736	0.66348470E-03	0.98700320E-02	0.00000000E+00
90	0.00000000E+00	0.00000000E+00	0.22636995	0.35247088E-03	0.98785544E-02	0.00000000E+00
91	0.00000000E+00	0.00000000E+00	0.22583523	-0.10270196E-10	0.98823449E-02	0.00000000E+00
92	0.00000000E+00	0.00000000E+00	0.22636995	-0.35247090E-03	0.98785544E-02	0.00000000E+00
93	0.00000000E+00	0.00000000E+00	0.22790736	-0.66348471E-03	0.98700320E-02	0.00000000E+00
94	0.00000000E+00	0.00000000E+00	0.23032521	-0.95736870E-03	0.99417450E-02	0.00000000E+00
95	0.00000000E+00	0.00000000E+00	0.23369491	-0.12932740E-02	0.10008731E-01	0.00000000E+00
96	0.00000000E+00	0.00000000E+00	0.23808589	-0.16301208E-02	0.10067694E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
97	0.00000000E+00	0.00000000E+00	0.20489208	-0.26279438E-02	0.11420688E-01	0.000
98	0.00000000E+00	0.00000000E+00	0.17106578	-0.35279023E-02	0.11121873E-01	0.000
99	0.00000000E+00	0.00000000E+00	0.13796763	-0.38327897E-02	0.11029295E-01	0.000
100	0.00000000E+00	0.00000000E+00	0.10442627	-0.37355212E-02	0.11398770E-01	0.000
101	0.00000000E+00	0.00000000E+00	0.69139360E-01	-0.35414331E-02	0.12183727E-01	0.000
102	0.00000000E+00	0.00000000E+00	0.30930459E-01	-0.34507575E-02	0.13346266E-01	0.000
103	0.00000000E+00	0.00000000E+00	-0.11200437E-01	-0.35219183E-02	0.14760088E-01	0.000
104	0.00000000E+00	0.00000000E+00	-0.57428078E-01	-0.36542201E-02	0.15973911E-01	0.000
105	0.00000000E+00	0.00000000E+00	-0.10634125	-0.37842931E-02	0.16491993E-01	0.000
106	0.00000000E+00	0.00000000E+00	-0.15549281	-0.36324891E-02	0.16108976E-01	0.000
107	0.00000000E+00	0.00000000E+00	-0.20234551	-0.29437156E-02	0.15055787E-01	0.000
108	0.00000000E+00	0.00000000E+00	-0.24689055	-0.21411589E-02	0.15217476E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
109	0.00000000E+00	0.00000000E+00	-0.29228003	-0.35237681E-02	0.14418014E-01	0.000
110	0.00000000E+00	0.00000000E+00	-0.33153878	-0.49434760E-02	0.11694489E-01	0.000
111	0.00000000E+00	0.00000000E+00	-0.36216951	-0.58330056E-02	0.87577306E-02	0.000
112	0.00000000E+00	0.00000000E+00	-0.38406855	-0.62875912E-02	0.58552827E-02	0.000
113	0.00000000E+00	0.00000000E+00	-0.39726451	-0.65005156E-02	0.29413845E-02	0.000
114	0.00000000E+00	0.00000000E+00	-0.40167919	-0.65639015E-02	0.30460733E-09	0.000
115	0.00000000E+00	0.00000000E+00	-0.39726451	-0.65005156E-02	-0.29413840E-02	0.000
116	0.00000000E+00	0.00000000E+00	-0.38406855	-0.62875912E-02	-0.58552822E-02	0.000
117	0.00000000E+00	0.00000000E+00	-0.36216952	-0.58330055E-02	-0.87577300E-02	0.000
118	0.00000000E+00	0.00000000E+00	-0.33153879	-0.49434760E-02	-0.11694489E-01	0.000
119	0.00000000E+00	0.00000000E+00	-0.29228003	-0.35237681E-02	-0.14418014E-01	0.000
120	0.00000000E+00	0.00000000E+00	-0.24689056	-0.21411586E-02	-0.15217476E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
121	0.00000000E+00	0.00000000E+00	-0.20234552	-0.29437151E-02	-0.15055787E-01	0.000
122	0.00000000E+00	0.00000000E+00	-0.15549283	-0.36324885E-02	-0.16108975E-01	0.000
123	0.00000000E+00	0.00000000E+00	-0.10634127	-0.37842923E-02	-0.16491992E-01	0.000
124	0.00000000E+00	0.00000000E+00	-0.57428095E-01	-0.36542192E-02	-0.15973911E-01	0.000
125	0.00000000E+00	0.00000000E+00	-0.11200454E-01	-0.35219173E-02	-0.14760088E-01	0.000
126	0.00000000E+00	0.00000000E+00	0.30930443E-01	-0.34507566E-02	-0.13346266E-01	0.000
127	0.00000000E+00	0.00000000E+00	0.69139342E-01	-0.35414322E-02	-0.12183726E-01	0.000
128	0.00000000E+00	0.00000000E+00	0.10442625	-0.37355204E-02	-0.11398770E-01	0.000
129	0.00000000E+00	0.00000000E+00	0.13796761	-0.38327892E-02	-0.11029295E-01	0.000
130	0.00000000E+00	0.00000000E+00	0.17106575	-0.35279021E-02	-0.11121872E-01	0.000
131	0.00000000E+00	0.00000000E+00	0.20489205	-0.26279440E-02	-0.11420688E-01	0.000
132	0.00000000E+00	0.00000000E+00	0.19914771	-0.10980163E-02	0.11928876E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1

TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
133	0.00000000E+00	0.00000000E+00	0.16411797	-0.78075562E-03	0.11292795E-01	0.000
134	0.00000000E+00	0.00000000E+00	0.13104066	-0.38034274E-03	0.10861354E-01	0.000
135	0.00000000E+00	0.00000000E+00	0.98287190E-01	0.52891073E-04	0.11093087E-01	0.000
136	0.00000000E+00	0.00000000E+00	0.63908667E-01	0.44584574E-03	0.11927596E-01	0.000
137	0.00000000E+00	0.00000000E+00	0.26225208E-01	0.69826428E-03	0.13270484E-01	0.000
138	0.00000000E+00	0.00000000E+00	-0.16016816E-01	0.69810482E-03	0.14895790E-01	0.000
139	0.00000000E+00	0.00000000E+00	-0.62916154E-01	0.39210176E-03	0.16269260E-01	0.000
140	0.00000000E+00	0.00000000E+00	-0.11279562	-0.13733297E-03	0.16793089E-01	0.000
141	0.00000000E+00	0.00000000E+00	-0.16252839	-0.75215018E-03	0.16163622E-01	0.000
142	0.00000000E+00	0.00000000E+00	-0.20890875	-0.13236589E-02	0.14788337E-01	0.000
143	0.00000000E+00	0.00000000E+00	-0.25272911	-0.17351342E-02	0.15413760E-01	0.000
144	0.00000000E+00	0.00000000E+00	-0.30088922	-0.20703571E-02	0.15514458E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
145	0.00000000E+00	0.00000000E+00	-0.34334570	-0.24791074E-02	0.12566508E-01	0.000
146	0.00000000E+00	0.00000000E+00	-0.37614058	-0.28760016E-02	0.93038991E-02	0.000
147	0.00000000E+00	0.00000000E+00	-0.39931866	-0.32012765E-02	0.61684323E-02	0.000
148	0.00000000E+00	0.00000000E+00	-0.41319585	-0.34136731E-02	0.30867094E-02	0.000
149	0.00000000E+00	0.00000000E+00	-0.41782748	-0.34873706E-02	0.12750159E-09	0.000
150	0.00000000E+00	0.00000000E+00	-0.41319585	-0.34136730E-02	-0.30867092E-02	0.000
151	0.00000000E+00	0.00000000E+00	-0.39931866	-0.32012765E-02	-0.61684320E-02	0.000
152	0.00000000E+00	0.00000000E+00	-0.37614058	-0.28760015E-02	-0.93038988E-02	0.000
153	0.00000000E+00	0.00000000E+00	-0.34334570	-0.24791073E-02	-0.12566507E-01	0.000
154	0.00000000E+00	0.00000000E+00	-0.30088922	-0.20703568E-02	-0.15514458E-01	0.000
155	0.00000000E+00	0.00000000E+00	-0.25272912	-0.17351338E-02	-0.15413760E-01	0.000
156	0.00000000E+00	0.00000000E+00	-0.20890876	-0.13236584E-02	-0.14788337E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
157	0.00000000E+00	0.00000000E+00	-0.16252840	-0.75214950E-03	-0.16163621E-01	0.000
158	0.00000000E+00	0.00000000E+00	-0.11279563	-0.13733210E-03	-0.16793089E-01	0.000
159	0.00000000E+00	0.00000000E+00	-0.62916162E-01	0.39210279E-03	-0.16269260E-01	0.000
160	0.00000000E+00	0.00000000E+00	-0.16016827E-01	0.69810593E-03	-0.14895790E-01	0.000
161	0.00000000E+00	0.00000000E+00	0.26225197E-01	0.69826539E-03	-0.13270484E-01	0.000
162	0.00000000E+00	0.00000000E+00	0.63908655E-01	0.44584678E-03	-0.11927596E-01	0.000
163	0.00000000E+00	0.00000000E+00	0.98287176E-01	0.52891979E-04	-0.11093087E-01	0.000
164	0.00000000E+00	0.00000000E+00	0.13104064	-0.38034193E-03	-0.10861354E-01	0.000
165	0.00000000E+00	0.00000000E+00	0.16411794	-0.78075492E-03	-0.11292794E-01	0.000
166	0.00000000E+00	0.00000000E+00	0.19914768	-0.10980158E-02	-0.11928875E-01	0.000
167	0.00000000E+00	0.00000000E+00	0.19815154	0.30450520E-03	0.10949587E-01	0.000
168	0.00000000E+00	0.00000000E+00	0.16606493	0.16470902E-02	0.10465583E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
169	0.00000000E+00	0.00000000E+00	0.13517014	0.25372269E-02	0.10258323E-01	0.000
170	0.00000000E+00	0.00000000E+00	0.10403332	0.30888685E-02	0.10621259E-01	0.000
171	0.00000000E+00	0.00000000E+00	0.70945337E-01	0.34950270E-02	0.11558312E-01	0.000
172	0.00000000E+00	0.00000000E+00	0.34172263E-01	0.38065669E-02	0.13078445E-01	0.000
173	0.00000000E+00	0.00000000E+00	-0.79433365E-02	0.38938882E-02	0.15048206E-01	0.000
174	0.00000000E+00	0.00000000E+00	-0.55913188E-01	0.35183753E-02	0.16790921E-01	0.000
175	0.00000000E+00	0.00000000E+00	-0.10782527	0.28000900E-02	0.17586865E-01	0.000
176	0.00000000E+00	0.00000000E+00	-0.16042184	0.16946382E-02	0.17230950E-01	0.000
177	0.00000000E+00	0.00000000E+00	-0.21047467	0.14623586E-03	0.15995223E-01	0.000
178	0.00000000E+00	0.00000000E+00	-0.25725318	-0.12808750E-02	0.15610049E-01	0.000
179	0.00000000E+00	0.00000000E+00	-0.30450122	-0.43183950E-03	0.15139524E-01	0.000
180	0.00000000E+00	0.00000000E+00	-0.34606057	0.35982640E-03	0.12455528E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
181	0.00000000E+00	0.00000000E+00	-0.37891059	0.63363715E-03	0.94349893E-02	0.000
182	0.00000000E+00	0.00000000E+00	-0.40263154	0.58074482E-03	0.63591759E-02	0.000
183	0.00000000E+00	0.00000000E+00	-0.41701699	0.46257213E-03	0.32091696E-02	0.000
184	0.00000000E+00	0.00000000E+00	-0.42184423	0.41122416E-03	-0.11577574E-09	0.000
185	0.00000000E+00	0.00000000E+00	-0.41701699	0.46257216E-03	-0.32091698E-02	0.000
186	0.00000000E+00	0.00000000E+00	-0.40263154	0.58074489E-03	-0.63591761E-02	0.000
187	0.00000000E+00	0.00000000E+00	-0.37891059	0.63363724E-03	-0.94349895E-02	0.000
188	0.00000000E+00	0.00000000E+00	-0.34606057	0.35982652E-03	-0.12455528E-01	0.000
189	0.00000000E+00	0.00000000E+00	-0.30450122	-0.43183930E-03	-0.15139524E-01	0.000
190	0.00000000E+00	0.00000000E+00	-0.25725318	-0.12808746E-02	-0.15610049E-01	0.000
191	0.00000000E+00	0.00000000E+00	-0.21047467	0.14623632E-03	-0.15995223E-01	0.000
192	0.00000000E+00	0.00000000E+00	-0.16042184	0.16946388E-02	-0.17230950E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
193	0.00000000E+00	0.00000000E+00	-0.10782528	0.28000907E-02	-0.17586865E-01	0.000
194	0.00000000E+00	0.00000000E+00	-0.55913189E-01	0.35183761E-02	-0.16790921E-01	0.000
195	0.00000000E+00	0.00000000E+00	-0.79433413E-02	0.38938891E-02	-0.15048205E-01	0.000
196	0.00000000E+00	0.00000000E+00	0.34172258E-01	0.38065678E-02	-0.13078445E-01	0.000
197	0.00000000E+00	0.00000000E+00	0.70945329E-01	0.34950278E-02	-0.11558312E-01	0.000
198	0.00000000E+00	0.00000000E+00	0.10403331	0.30888693E-02	-0.10621259E-01	0.000
199	0.00000000E+00	0.00000000E+00	0.13517012	0.25372276E-02	-0.10258322E-01	0.000
200	0.00000000E+00	0.00000000E+00	0.16606491	0.16470912E-02	-0.10465582E-01	0.000
201	0.00000000E+00	0.00000000E+00	0.19815151	0.30450633E-03	-0.10949586E-01	0.000

202	0.00000000E+00	0.00000000E+00	0.19860100	-0.66920186E-03	0.96866673E-02	0.000
203	0.00000000E+00	0.00000000E+00	0.16964925	-0.67524117E-03	0.96435675E-02	0.000
204	0.00000000E+00	0.00000000E+00	0.14051392	-0.68214872E-03	0.98265417E-02	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
205	0.00000000E+00	0.00000000E+00	0.11035216	-0.69065072E-03	0.10347433E-01	0.000
206	0.00000000E+00	0.00000000E+00	0.77973014E-01	-0.70153711E-03	0.11324721E-01	0.000
207	0.00000000E+00	0.00000000E+00	0.41827254E-01	-0.71551847E-03	0.12878749E-01	0.000
208	0.00000000E+00	0.00000000E+00	0.00000000E+00	-0.73304893E-03	0.15133698E-01	0.000
209	0.00000000E+00	0.00000000E+00	-0.48784211E-01	-0.75416070E-03	0.17197891E-01	0.000
210	0.00000000E+00	0.00000000E+00	-0.10210566	-0.77840641E-03	0.18179946E-01	0.000
211	0.00000000E+00	0.00000000E+00	-0.15690604	-0.80495796E-03	0.18203913E-01	0.000
212	0.00000000E+00	0.00000000E+00	-0.21048531	-0.83283199E-03	0.17383514E-01	0.000
213	0.00000000E+00	0.00000000E+00	-0.26045141	-0.86116337E-03	0.15805152E-01	0.000
214	0.00000000E+00	0.00000000E+00	-0.30553641	-0.87117497E-03	0.14159815E-01	0.000
215	0.00000000E+00	0.00000000E+00	-0.34488359	-0.88057278E-03	0.11989743E-01	0.000
216	0.00000000E+00	0.00000000E+00	-0.37703429	-0.88877319E-03	0.93792268E-02	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
217	0.00000000E+00	0.00000000E+00	-0.40082672	-0.89516684E-03	0.64362949E-02	0.000
→218	0.00000000E+00	0.00000000E+00	-0.41543180	-0.89923272E-03	0.32729595E-02	0.000
→219	0.00000000E+00	0.00000000E+00	-0.42035492	-0.90062771E-03	-0.23084149E-09	0.000
→220	0.00000000E+00	0.00000000E+00	-0.41543180	-0.89923269E-03	-0.32729599E-02	0.000
221	0.00000000E+00	0.00000000E+00	-0.40082671	-0.89516677E-03	-0.64362953E-02	0.000
222	0.00000000E+00	0.00000000E+00	-0.37703428	-0.88877309E-03	-0.93792272E-02	0.000
223	0.00000000E+00	0.00000000E+00	-0.34488358	-0.88057265E-03	-0.11989744E-01	0.000
224	0.00000000E+00	0.00000000E+00	-0.30553641	-0.87117480E-03	-0.14159815E-01	0.000
225	0.00000000E+00	0.00000000E+00	-0.26045141	-0.86116317E-03	-0.15805152E-01	0.000
226	0.00000000E+00	0.00000000E+00	-0.21048531	-0.83283178E-03	-0.17383514E-01	0.000
227	0.00000000E+00	0.00000000E+00	-0.15690604	-0.80495775E-03	-0.18203913E-01	0.000
228	0.00000000E+00	0.00000000E+00	-0.10210566	-0.77840620E-03	-0.18179946E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
229	0.00000000E+00	0.00000000E+00	-0.48784209E-01	-0.75416049E-03	-0.17197891E-01	0.000
230	0.00000000E+00	0.00000000E+00	0.00000000E+00	-0.73304872E-03	-0.15133697E-01	0.000
231	0.00000000E+00	0.00000000E+00	0.41827251E-01	-0.71551826E-03	-0.12878749E-01	0.000
232	0.00000000E+00	0.00000000E+00	0.77973009E-01	-0.70153690E-03	-0.11324720E-01	0.000
233	0.00000000E+00	0.00000000E+00	0.11035215	-0.69065052E-03	-0.10347432E-01	0.000

234	0.00000000E+00	0.00000000E+00	0.14051391	-0.68214852E-03	-0.98265410E-02	0.000
235	0.00000000E+00	0.00000000E+00	0.16964923	-0.67524098E-03	-0.96435666E-02	0.000
236	0.00000000E+00	0.00000000E+00	0.19860098	-0.66920167E-03	-0.96866664E-02	0.000
237	0.00000000E+00	0.00000000E+00	0.19441296	-0.14690125E-02	0.10843421E-01	0.000
238	0.00000000E+00	0.00000000E+00	0.16272245	-0.25672075E-02	0.10302595E-01	0.000
239	0.00000000E+00	0.00000000E+00	0.13234889	-0.31459507E-02	0.10066687E-01	0.000
240	0.00000000E+00	0.00000000E+00	0.10176792	-0.33655118E-02	0.10434728E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
241	0.00000000E+00	0.00000000E+00	0.69159283E-01	-0.34807505E-02	0.11420437E-01	0.000
242	0.00000000E+00	0.00000000E+00	0.32650282E-01	-0.36205538E-02	0.13039268E-01	0.000
243	0.00000000E+00	0.00000000E+00	-0.95460161E-02	-0.37290346E-02	0.15142696E-01	0.000
244	0.00000000E+00	0.00000000E+00	-0.57985490E-01	-0.35931112E-02	0.17013042E-01	0.000
245	0.00000000E+00	0.00000000E+00	-0.11067634	-0.32860294E-02	0.17888773E-01	0.000
246	0.00000000E+00	0.00000000E+00	-0.16418818	-0.26667442E-02	0.17544052E-01	0.000
247	0.00000000E+00	0.00000000E+00	-0.21508462	-0.15713356E-02	0.16248613E-01	0.000
248	0.00000000E+00	0.00000000E+00	-0.26247766	-0.47179422E-03	0.15806591E-01	0.000
249	0.00000000E+00	0.00000000E+00	-0.31020358	-0.15812150E-02	0.15307955E-01	0.000
250	0.00000000E+00	0.00000000E+00	-0.35228467	-0.26752592E-02	0.12642128E-01	0.000
251	0.00000000E+00	0.00000000E+00	-0.38566564	-0.32476984E-02	0.96073654E-02	0.000
252	0.00000000E+00	0.00000000E+00	-0.40983071	-0.34432776E-02	0.64884685E-02	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
253	0.00000000E+00	0.00000000E+00	-0.42450710	-0.34881759E-02	0.32779387E-02	0.000
254	0.00000000E+00	0.00000000E+00	-0.42943529	-0.34934837E-02	-0.34763270E-09	0.000
255	0.00000000E+00	0.00000000E+00	-0.42450710	-0.34881758E-02	-0.32779394E-02	0.000
256	0.00000000E+00	0.00000000E+00	-0.40983070	-0.34432776E-02	-0.64884692E-02	0.000
257	0.00000000E+00	0.00000000E+00	-0.38566564	-0.32476983E-02	-0.96073661E-02	0.000
258	0.00000000E+00	0.00000000E+00	-0.35228467	-0.26752592E-02	-0.12642128E-01	0.000
259	0.00000000E+00	0.00000000E+00	-0.31020358	-0.15812148E-02	-0.15307955E-01	0.000
260	0.00000000E+00	0.00000000E+00	-0.26247765	-0.47179411E-03	-0.15806592E-01	0.000
261	0.00000000E+00	0.00000000E+00	-0.21508461	-0.15713354E-02	-0.16248613E-01	0.000
262	0.00000000E+00	0.00000000E+00	-0.16418818	-0.26667441E-02	-0.17544052E-01	0.000
263	0.00000000E+00	0.00000000E+00	-0.11067633	-0.32860293E-02	-0.17888773E-01	0.000
264	0.00000000E+00	0.00000000E+00	-0.57985486E-01	-0.35931111E-02	-0.17013042E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
265	0.00000000E+00	0.00000000E+00	-0.95460141E-02	-0.37290345E-02	-0.15142695E-01	0.000

266	0.00000000E+00	0.00000000E+00	0.32650282E-01	-0.36205537E-02	-0.13039268E-01	0.00000000E+00
267	0.00000000E+00	0.00000000E+00	0.69159279E-01	-0.34807504E-02	-0.11420436E-01	0.00000000E+00
268	0.00000000E+00	0.00000000E+00	0.10176791	-0.33655118E-02	-0.10434727E-01	0.00000000E+00
269	0.00000000E+00	0.00000000E+00	0.13234888	-0.31459507E-02	-0.10066686E-01	0.00000000E+00
270	0.00000000E+00	0.00000000E+00	0.16272243	-0.25672079E-02	-0.10302594E-01	0.00000000E+00
271	0.00000000E+00	0.00000000E+00	0.19441294	-0.14690131E-02	-0.10843420E-01	0.00000000E+00
272	0.00000000E+00	0.00000000E+00	0.19203319	-0.18754572E-10	0.11576214E-01	0.00000000E+00
273	0.00000000E+00	0.00000000E+00	0.15830596	-0.33624020E-10	0.10790134E-01	0.00000000E+00
274	0.00000000E+00	0.00000000E+00	0.12688099	-0.34388191E-10	0.10277149E-01	0.00000000E+00
275	0.00000000E+00	0.00000000E+00	0.95896157E-01	-0.43433221E-10	0.10518284E-01	0.00000000E+00
276	0.00000000E+00	0.00000000E+00	0.63077900E-01	0.63324836E-10	0.11487972E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
277	0.00000000E+00	0.00000000E+00	0.26324608E-01	0.31926072E-10	0.13115343E-01	0.00000000E+00
278	0.00000000E+00	0.00000000E+00	-0.16034875E-01	0.16299564E-10	0.15138127E-01	0.00000000E+00
279	0.00000000E+00	0.00000000E+00	-0.64253378E-01	0.75731422E-11	0.16889959E-01	0.00000000E+00
280	0.00000000E+00	0.00000000E+00	-0.11638486	-0.27176522E-11	0.17640632E-01	0.00000000E+00
281	0.00000000E+00	0.00000000E+00	-0.16876616	-0.12771005E-10	0.17046739E-01	0.00000000E+00
282	0.00000000E+00	0.00000000E+00	-0.21762516	0.38977729E-10	0.15523293E-01	0.00000000E+00
283	0.00000000E+00	0.00000000E+00	-0.26319729	-0.14285509E-10	0.15807080E-01	0.00000000E+00
284	0.00000000E+00	0.00000000E+00	-0.31275541	-0.13186831E-10	0.16038162E-01	0.00000000E+00
285	0.00000000E+00	0.00000000E+00	-0.35686505	-0.25514816E-10	0.13127970E-01	0.00000000E+00
286	0.00000000E+00	0.00000000E+00	-0.39128556	-0.33622685E-10	0.98111999E-02	0.00000000E+00
287	0.00000000E+00	0.00000000E+00	-0.41581021	-0.36545420E-10	0.65477726E-02	0.00000000E+00
288	0.00000000E+00	0.00000000E+00	-0.43056920	-0.37321358E-10	0.32886175E-02	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
289	0.00000000E+00	0.00000000E+00	-0.43550697	-0.37487541E-10	-0.35707292E-09	0.00000000E+00
290	0.00000000E+00	0.00000000E+00	-0.43056920	-0.37321062E-10	-0.32886182E-02	0.00000000E+00
291	0.00000000E+00	0.00000000E+00	-0.41581021	-0.36544894E-10	-0.65477733E-02	0.00000000E+00
292	0.00000000E+00	0.00000000E+00	-0.39128555	-0.33621987E-10	-0.98112006E-02	0.00000000E+00
293	0.00000000E+00	0.00000000E+00	-0.35686504	-0.25514107E-10	-0.13127971E-01	0.00000000E+00
294	0.00000000E+00	0.00000000E+00	-0.31275540	-0.13186267E-10	-0.16038162E-01	0.00000000E+00
295	0.00000000E+00	0.00000000E+00	-0.26319728	-0.14285211E-10	-0.15807080E-01	0.00000000E+00
296	0.00000000E+00	0.00000000E+00	-0.21762515	0.38977611E-10	-0.15523294E-01	0.00000000E+00
297	0.00000000E+00	0.00000000E+00	-0.16876615	-0.12771441E-10	-0.17046739E-01	0.00000000E+00
298	0.00000000E+00	0.00000000E+00	-0.11638485	-0.27178527E-11	-0.17640632E-01	0.00000000E+00
299	0.00000000E+00	0.00000000E+00	-0.64253373E-01	0.75738325E-11	-0.16889958E-01	0.00000000E+00
300	0.00000000E+00	0.00000000E+00	-0.16034873E-01	0.16301968E-10	-0.15138127E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
301	0.00000000E+00	0.00000000E+00	0.26324608E-01	0.31930019E-10	-0.13115343E-01	0.000
302	0.00000000E+00	0.00000000E+00	0.63077896E-01	0.63328368E-10	-0.11487972E-01	0.000
303	0.00000000E+00	0.00000000E+00	0.95896150E-01	-0.43426843E-10	-0.10518284E-01	0.000
304	0.00000000E+00	0.00000000E+00	0.12688098	-0.34347806E-10	-0.10277148E-01	0.000
305	0.00000000E+00	0.00000000E+00	0.15830594	-0.33464104E-10	-0.10790133E-01	0.000
306	0.00000000E+00	0.00000000E+00	0.19203317	-0.18467351E-10	-0.11576213E-01	0.000
307	0.00000000E+00	0.00000000E+00	0.19441296	0.14690124E-02	0.10843421E-01	0.000
308	0.00000000E+00	0.00000000E+00	0.16272245	0.25672074E-02	0.10302595E-01	0.000
309	0.00000000E+00	0.00000000E+00	0.13234889	0.31459506E-02	0.10066687E-01	0.000
310	0.00000000E+00	0.00000000E+00	0.10176792	0.33655118E-02	0.10434728E-01	0.000
311	0.00000000E+00	0.00000000E+00	0.69159283E-01	0.34807505E-02	0.11420437E-01	0.000
312	0.00000000E+00	0.00000000E+00	0.32650282E-01	0.36205538E-02	0.13039268E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
313	0.00000000E+00	0.00000000E+00	-0.95460160E-02	0.37290346E-02	0.15142696E-01	0.000
314	0.00000000E+00	0.00000000E+00	-0.57985490E-01	0.35931112E-02	0.17013042E-01	0.000
315	0.00000000E+00	0.00000000E+00	-0.11067634	0.32860294E-02	0.17888773E-01	0.000
316	0.00000000E+00	0.00000000E+00	-0.16418818	0.26667442E-02	0.17544052E-01	0.000
317	0.00000000E+00	0.00000000E+00	-0.21508462	0.15713356E-02	0.16248613E-01	0.000
318	0.00000000E+00	0.00000000E+00	-0.26247766	0.47179418E-03	0.15806591E-01	0.000
319	0.00000000E+00	0.00000000E+00	-0.31020358	0.15812149E-02	0.15307955E-01	0.000
320	0.00000000E+00	0.00000000E+00	-0.35228467	0.26752592E-02	0.12642128E-01	0.000
321	0.00000000E+00	0.00000000E+00	-0.38566564	0.32476983E-02	0.96073654E-02	0.000
322	0.00000000E+00	0.00000000E+00	-0.40983071	0.34432776E-02	0.64884685E-02	0.000
323	0.00000000E+00	0.00000000E+00	-0.42450710	0.34881758E-02	0.32779387E-02	0.000
324	0.00000000E+00	0.00000000E+00	-0.42943529	0.34934837E-02	-0.34763297E-09	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
325	0.00000000E+00	0.00000000E+00	-0.42450710	0.34881758E-02	-0.32779394E-02	0.000
326	0.00000000E+00	0.00000000E+00	-0.40983070	0.34432775E-02	-0.64884692E-02	0.000
327	0.00000000E+00	0.00000000E+00	-0.38566564	0.32476983E-02	-0.96073661E-02	0.000
328	0.00000000E+00	0.00000000E+00	-0.35228467	0.26752591E-02	-0.12642128E-01	0.000
329	0.00000000E+00	0.00000000E+00	-0.31020358	0.15812148E-02	-0.15307955E-01	0.000
330	0.00000000E+00	0.00000000E+00	-0.26247765	0.47179408E-03	-0.15806592E-01	0.000
331	0.00000000E+00	0.00000000E+00	-0.21508461	0.15713355E-02	-0.16248613E-01	0.000
332	0.00000000E+00	0.00000000E+00	-0.16418818	0.26667441E-02	-0.17544052E-01	0.000
333	0.00000000E+00	0.00000000E+00	-0.11067633	0.32860293E-02	-0.17888773E-01	0.000
334	0.00000000E+00	0.00000000E+00	-0.57985486E-01	0.35931111E-02	-0.17013042E-01	0.000
335	0.00000000E+00	0.00000000E+00	-0.95460140E-02	0.37290345E-02	-0.15142695E-01	0.000
336	0.00000000E+00	0.00000000E+00	0.32650282E-01	0.36205537E-02	-0.13039268E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
337	0.00000000E+00	0.00000000E+00	0.69159279E-01	0.34807504E-02	-0.11420436E-01	0.000
338	0.00000000E+00	0.00000000E+00	0.10176791	0.33655117E-02	-0.10434727E-01	0.000
339	0.00000000E+00	0.00000000E+00	0.13234888	0.31459507E-02	-0.10066686E-01	0.000
340	0.00000000E+00	0.00000000E+00	0.16272243	0.25672078E-02	-0.10302594E-01	0.000
341	0.00000000E+00	0.00000000E+00	0.19441294	0.14690131E-02	-0.10843420E-01	0.000
342	0.00000000E+00	0.00000000E+00	0.19860100	0.66920182E-03	0.96866673E-02	0.000
343	0.00000000E+00	0.00000000E+00	0.16964925	0.67524115E-03	0.96435674E-02	0.000
344	0.00000000E+00	0.00000000E+00	0.14051392	0.68214870E-03	0.98265417E-02	0.000
345	0.00000000E+00	0.00000000E+00	0.11035216	0.69065071E-03	0.10347433E-01	0.000
346	0.00000000E+00	0.00000000E+00	0.77973014E-01	0.70153708E-03	0.11324721E-01	0.000
347	0.00000000E+00	0.00000000E+00	0.41827254E-01	0.71551841E-03	0.12878749E-01	0.000
348	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.73304887E-03	0.15133698E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
349	0.00000000E+00	0.00000000E+00	-0.48784211E-01	0.75416064E-03	0.17197891E-01	0.000
350	0.00000000E+00	0.00000000E+00	-0.10210566	0.77840634E-03	0.18179946E-01	0.000
351	0.00000000E+00	0.00000000E+00	-0.15690604	0.80495789E-03	0.18203913E-01	0.000
352	0.00000000E+00	0.00000000E+00	-0.21048531	0.83283192E-03	0.17383514E-01	0.000
353	0.00000000E+00	0.00000000E+00	-0.26045142	0.86116330E-03	0.15805152E-01	0.000
354	0.00000000E+00	0.00000000E+00	-0.30553641	0.87117493E-03	0.14159815E-01	0.000
355	0.00000000E+00	0.00000000E+00	-0.34488359	0.88057278E-03	0.11989743E-01	0.000
356	0.00000000E+00	0.00000000E+00	-0.37703429	0.88877319E-03	0.93792268E-02	0.000
357	0.00000000E+00	0.00000000E+00	-0.40082672	0.89516684E-03	0.64362949E-02	0.000
→ 358	0.00000000E+00	0.00000000E+00	-0.41543180 ←	0.89923272E-03	0.32729595E-02	0.000
→ 359	0.00000000E+00	0.00000000E+00	-0.42035492 ←	0.90062771E-03	-0.23084177E-09	0.000
→ 360	0.00000000E+00	0.00000000E+00	-0.41543180 ←	0.89923269E-03	-0.32729599E-02	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
361	0.00000000E+00	0.00000000E+00	-0.40082672	0.89516677E-03	-0.64362953E-02	0.000
362	0.00000000E+00	0.00000000E+00	-0.37703428	0.88877309E-03	-0.93792272E-02	0.000
363	0.00000000E+00	0.00000000E+00	-0.34488358	0.88057265E-03	-0.11989744E-01	0.000
364	0.00000000E+00	0.00000000E+00	-0.30553641	0.87117476E-03	-0.14159815E-01	0.000
365	0.00000000E+00	0.00000000E+00	-0.26045141	0.86116309E-03	-0.15805152E-01	0.000
366	0.00000000E+00	0.00000000E+00	-0.21048531	0.83283171E-03	-0.17383514E-01	0.000
367	0.00000000E+00	0.00000000E+00	-0.15690604	0.80495768E-03	-0.18203913E-01	0.000
368	0.00000000E+00	0.00000000E+00	-0.10210566	0.77840613E-03	-0.18179946E-01	0.000
369	0.00000000E+00	0.00000000E+00	-0.48784209E-01	0.75416043E-03	-0.17197891E-01	0.000
370	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.73304866E-03	-0.15133697E-01	0.000
371	0.00000000E+00	0.00000000E+00	0.41827251E-01	0.71551821E-03	-0.12878749E-01	0.000

372 0.00000000E+00 0.00000000E+00 0.77973009E-01 0.70153688E-03 -0.11324720E-01 0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
373	0.00000000E+00	0.00000000E+00	0.11035215	0.69065051E-03	-0.10347432E-01	0.000
374	0.00000000E+00	0.00000000E+00	0.14051391	0.68214850E-03	-0.98265410E-02	0.000
375	0.00000000E+00	0.00000000E+00	0.16964923	0.67524096E-03	-0.96435666E-02	0.000
376	0.00000000E+00	0.00000000E+00	0.19860098	0.66920164E-03	-0.96866664E-02	0.000
377	0.00000000E+00	0.00000000E+00	0.19815154	-0.30450532E-03	0.10949587E-01	0.000
378	0.00000000E+00	0.00000000E+00	0.16606493	-0.16470904E-02	0.10465583E-01	0.000
379	0.00000000E+00	0.00000000E+00	0.13517013	-0.25372271E-02	0.10258323E-01	0.000
380	0.00000000E+00	0.00000000E+00	0.10403331	-0.30888688E-02	0.10621259E-01	0.000
381	0.00000000E+00	0.00000000E+00	0.70945337E-01	-0.34950273E-02	0.11558312E-01	0.000
382	0.00000000E+00	0.00000000E+00	0.34172263E-01	-0.38065671E-02	0.13078445E-01	0.000
383	0.00000000E+00	0.00000000E+00	-0.79433368E-02	-0.38938884E-02	0.15048206E-01	0.000
384	0.00000000E+00	0.00000000E+00	-0.55913188E-01	-0.35183754E-02	0.16790921E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
385	0.00000000E+00	0.00000000E+00	-0.10782528	-0.28000902E-02	0.17586865E-01	0.000
386	0.00000000E+00	0.00000000E+00	-0.16042184	-0.16946383E-02	0.17230950E-01	0.000
387	0.00000000E+00	0.00000000E+00	-0.21047467	-0.14623594E-03	0.15995223E-01	0.000
388	0.00000000E+00	0.00000000E+00	-0.25725318	0.12808749E-02	0.15610049E-01	0.000
389	0.00000000E+00	0.00000000E+00	-0.30450122	0.43183944E-03	0.15139524E-01	0.000
390	0.00000000E+00	0.00000000E+00	-0.34606057	-0.35982651E-03	0.12455528E-01	0.000
391	0.00000000E+00	0.00000000E+00	-0.37891059	-0.63363728E-03	0.94349893E-02	0.000
392	0.00000000E+00	0.00000000E+00	-0.40263154	-0.58074496E-03	0.63591759E-02	0.000
393	0.00000000E+00	0.00000000E+00	-0.41701699	-0.46257226E-03	0.32091696E-02	0.000
394	0.00000000E+00	0.00000000E+00	-0.42184423	-0.41122429E-03	-0.11577569E-09	0.000
395	0.00000000E+00	0.00000000E+00	-0.41701699	-0.46257229E-03	-0.32091698E-02	0.000
396	0.00000000E+00	0.00000000E+00	-0.40263154	-0.58074502E-03	-0.63591761E-02	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
397	0.00000000E+00	0.00000000E+00	-0.37891059	-0.63363737E-03	-0.94349895E-02	0.000
398	0.00000000E+00	0.00000000E+00	-0.34606057	-0.35982663E-03	-0.12455528E-01	0.000
399	0.00000000E+00	0.00000000E+00	-0.30450122	0.43183923E-03	-0.15139524E-01	0.000
400	0.00000000E+00	0.00000000E+00	-0.25725318	0.12808746E-02	-0.15610049E-01	0.000
401	0.00000000E+00	0.00000000E+00	-0.21047467	-0.14623640E-03	-0.15995223E-01	0.000
402	0.00000000E+00	0.00000000E+00	-0.16042184	-0.16946389E-02	-0.17230950E-01	0.000
403	0.00000000E+00	0.00000000E+00	-0.10782528	-0.28000909E-02	-0.17586865E-01	0.000

404	0.00000000E+00	0.00000000E+00	-0.55913190E-01	-0.35183763E-02	-0.16790921E-01	0.00000000E+00
405	0.00000000E+00	0.00000000E+00	-0.79433415E-02	-0.38938893E-02	-0.15048205E-01	0.00000000E+00
406	0.00000000E+00	0.00000000E+00	0.34172258E-01	-0.38065680E-02	-0.13078445E-01	0.00000000E+00
407	0.00000000E+00	0.00000000E+00	0.70945329E-01	-0.34950281E-02	-0.11558311E-01	0.00000000E+00
408	0.00000000E+00	0.00000000E+00	0.10403330	-0.30888695E-02	-0.10621259E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
409	0.00000000E+00	0.00000000E+00	0.13517012	-0.25372279E-02	-0.10258322E-01	0.00000000E+00
410	0.00000000E+00	0.00000000E+00	0.16606491	-0.16470914E-02	-0.10465582E-01	0.00000000E+00
411	0.00000000E+00	0.00000000E+00	0.19815151	-0.30450645E-03	-0.10949586E-01	0.00000000E+00
412	0.00000000E+00	0.00000000E+00	0.19914771	0.10980162E-02	0.11928876E-01	0.00000000E+00
413	0.00000000E+00	0.00000000E+00	0.16411797	0.78075533E-03	0.11292795E-01	0.00000000E+00
414	0.00000000E+00	0.00000000E+00	0.13104066	0.38034239E-03	0.10861354E-01	0.00000000E+00
415	0.00000000E+00	0.00000000E+00	0.98287188E-01	-0.52891427E-04	0.11093087E-01	0.00000000E+00
416	0.00000000E+00	0.00000000E+00	0.63908666E-01	-0.44584613E-03	0.11927596E-01	0.00000000E+00
417	0.00000000E+00	0.00000000E+00	0.26225207E-01	-0.69826472E-03	0.13270484E-01	0.00000000E+00
418	0.00000000E+00	0.00000000E+00	-0.16016817E-01	-0.69810526E-03	0.14895790E-01	0.00000000E+00
419	0.00000000E+00	0.00000000E+00	-0.62916155E-01	-0.39210202E-03	0.16269260E-01	0.00000000E+00
420	0.00000000E+00	0.00000000E+00	-0.11279563	0.13733273E-03	0.16793089E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
421	0.00000000E+00	0.00000000E+00	-0.16252839	0.75215000E-03	0.16163622E-01	0.00000000E+00
422	0.00000000E+00	0.00000000E+00	-0.20890876	0.13236588E-02	0.14788337E-01	0.00000000E+00
423	0.00000000E+00	0.00000000E+00	-0.25272911	0.17351342E-02	0.15413760E-01	0.00000000E+00
424	0.00000000E+00	0.00000000E+00	-0.30088922	0.20703569E-02	0.15514458E-01	0.00000000E+00
425	0.00000000E+00	0.00000000E+00	-0.34334570	0.24791072E-02	0.12566508E-01	0.00000000E+00
426	0.00000000E+00	0.00000000E+00	-0.37614058	0.28760013E-02	0.93038991E-02	0.00000000E+00
427	0.00000000E+00	0.00000000E+00	-0.39931866	0.32012762E-02	0.61684323E-02	0.00000000E+00
428	0.00000000E+00	0.00000000E+00	-0.41319585	0.34136727E-02	0.30867094E-02	0.00000000E+00
429	0.00000000E+00	0.00000000E+00	-0.41782748	0.34873702E-02	0.12750216E-09	0.00000000E+00
430	0.00000000E+00	0.00000000E+00	-0.41319585	0.34136727E-02	-0.30867092E-02	0.00000000E+00
431	0.00000000E+00	0.00000000E+00	-0.39931866	0.32012761E-02	-0.61684320E-02	0.00000000E+00
432	0.00000000E+00	0.00000000E+00	-0.37614058	0.28760012E-02	-0.93038988E-02	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
433	0.00000000E+00	0.00000000E+00	-0.34334570	0.24791070E-02	-0.12566507E-01	0.00000000E+00
434	0.00000000E+00	0.00000000E+00	-0.30088922	0.20703567E-02	-0.15514458E-01	0.00000000E+00
435	0.00000000E+00	0.00000000E+00	-0.25272912	0.17351338E-02	-0.15413760E-01	0.00000000E+00

436	0.00000000E+00	0.00000000E+00	-0.20890876	0.13236583E-02	-0.14788337E-01	0.00000000E+00
437	0.00000000E+00	0.00000000E+00	-0.16252840	0.75214932E-03	-0.16163621E-01	0.00000000E+00
438	0.00000000E+00	0.00000000E+00	-0.11279563	0.13733185E-03	-0.16793089E-01	0.00000000E+00
439	0.00000000E+00	0.00000000E+00	-0.62916162E-01	-0.39210306E-03	-0.16269260E-01	0.00000000E+00
440	0.00000000E+00	0.00000000E+00	-0.16016828E-01	-0.69810637E-03	-0.14895790E-01	0.00000000E+00
441	0.00000000E+00	0.00000000E+00	0.26225196E-01	-0.69826582E-03	-0.13270484E-01	0.00000000E+00
442	0.00000000E+00	0.00000000E+00	0.63908653E-01	-0.44584717E-03	-0.11927596E-01	0.00000000E+00
443	0.00000000E+00	0.00000000E+00	0.98287174E-01	-0.52892347E-04	-0.11093087E-01	0.00000000E+00
444	0.00000000E+00	0.00000000E+00	0.13104064	0.38034158E-03	-0.10861354E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
445	0.00000000E+00	0.00000000E+00	0.16411794	0.78075462E-03	-0.11292794E-01	0.00000000E+00
446	0.00000000E+00	0.00000000E+00	0.19914768	0.10980156E-02	-0.11928876E-01	0.00000000E+00
447	0.00000000E+00	0.00000000E+00	0.20489207	0.26279438E-02	0.11420689E-01	0.00000000E+00
448	0.00000000E+00	0.00000000E+00	0.17106578	0.35279023E-02	0.11121873E-01	0.00000000E+00
449	0.00000000E+00	0.00000000E+00	0.13796763	0.38327898E-02	0.11029295E-01	0.00000000E+00
450	0.00000000E+00	0.00000000E+00	0.10442626	0.37355212E-02	0.11398770E-01	0.00000000E+00
451	0.00000000E+00	0.00000000E+00	0.69139358E-01	0.35414331E-02	0.12183726E-01	0.00000000E+00
452	0.00000000E+00	0.00000000E+00	0.30930459E-01	0.34507574E-02	0.13346266E-01	0.00000000E+00
453	0.00000000E+00	0.00000000E+00	-0.11200439E-01	0.35219181E-02	0.14760088E-01	0.00000000E+00
454	0.00000000E+00	0.00000000E+00	-0.57428080E-01	0.36542200E-02	0.15973911E-01	0.00000000E+00
455	0.00000000E+00	0.00000000E+00	-0.10634125	0.37842930E-02	0.16491993E-01	0.00000000E+00
456	0.00000000E+00	0.00000000E+00	-0.15549281	0.36324890E-02	0.16108976E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
457	0.00000000E+00	0.00000000E+00	-0.20234551	0.29437155E-02	0.15055787E-01	0.00000000E+00
458	0.00000000E+00	0.00000000E+00	-0.24689055	0.21411589E-02	0.15217476E-01	0.00000000E+00
459	0.00000000E+00	0.00000000E+00	-0.29228003	0.35237680E-02	0.14418014E-01	0.00000000E+00
460	0.00000000E+00	0.00000000E+00	-0.33153878	0.49434759E-02	0.11694489E-01	0.00000000E+00
461	0.00000000E+00	0.00000000E+00	-0.36216951	0.58330054E-02	0.87577306E-02	0.00000000E+00
462	0.00000000E+00	0.00000000E+00	-0.38406855	0.62875911E-02	0.58552827E-02	0.00000000E+00
463	0.00000000E+00	0.00000000E+00	-0.39726451	0.65005155E-02	0.29413845E-02	0.00000000E+00
464	0.00000000E+00	0.00000000E+00	-0.40167919	0.65639014E-02	0.30460858E-09	0.00000000E+00
465	0.00000000E+00	0.00000000E+00	-0.39726452	0.65005155E-02	-0.29413840E-02	0.00000000E+00
466	0.00000000E+00	0.00000000E+00	-0.38406855	0.62875911E-02	-0.58552822E-02	0.00000000E+00
467	0.00000000E+00	0.00000000E+00	-0.36216952	0.58330054E-02	-0.87577301E-02	0.00000000E+00
468	0.00000000E+00	0.00000000E+00	-0.33153879	0.49434759E-02	-0.11694489E-01	0.00000000E+00

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
469	0.00000000E+00	0.00000000E+00	-0.29228004	0.35237680E-02	-0.14418014E-01	0.000
470	0.00000000E+00	0.00000000E+00	-0.24689056	0.21411586E-02	-0.15217476E-01	0.000
471	0.00000000E+00	0.00000000E+00	-0.20234552	0.29437150E-02	-0.15055787E-01	0.000
472	0.00000000E+00	0.00000000E+00	-0.15549283	0.36324883E-02	-0.16108975E-01	0.000
473	0.00000000E+00	0.00000000E+00	-0.10634127	0.37842922E-02	-0.16491992E-01	0.000
474	0.00000000E+00	0.00000000E+00	-0.57428097E-01	0.36542191E-02	-0.15973911E-01	0.000
475	0.00000000E+00	0.00000000E+00	-0.11200456E-01	0.35219172E-02	-0.14760088E-01	0.000
476	0.00000000E+00	0.00000000E+00	0.30930440E-01	0.34507565E-02	-0.13346266E-01	0.000
477	0.00000000E+00	0.00000000E+00	0.69139340E-01	0.35414322E-02	-0.12183726E-01	0.000
478	0.00000000E+00	0.00000000E+00	0.10442625	0.37355204E-02	-0.11398770E-01	0.000
479	0.00000000E+00	0.00000000E+00	0.13796761	0.38327892E-02	-0.11029295E-01	0.000
480	0.00000000E+00	0.00000000E+00	0.17106575	0.35279021E-02	-0.11121873E-01	0.000

***** POST1 NODAL DISPLACEMENT LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z DISPLACEMENTS ARE IN NODAL COORDINATES

NODE	UX	UY	UZ	ROTX	ROTY	F
481	0.00000000E+00	0.00000000E+00	0.20489204	0.26279440E-02	-0.11420688E-01	0.000

MAXIMUMS						
NODE	0	0	289	114	367	
VALUE	0.00000000E+00	0.00000000E+00	-0.43550697	-0.65639015E-02	-0.18203913E-01	0.000

***** ROUTINE COMPLETED ***** CP = 5.710

ENTER HELP FOR LIST OF OPTIONS
ENTER /EOF TO EXIT

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SYSTEM= (FERMILAB) UPDATE= 350 A 21
FOR SUPPORT CALL MARK LEININGER PHONE (312) 840-4776 TWX
CURRENT JOBNAME=FILE

/EOF ENCOUNTERED ON FILE 5

DATA INPUT WRITTEN ON FILE18

***** RUN COMPLETED ***** CP= 5.7600 TIME= 9.4998

APPENDIX C

BEAMAC II beam name: platform3b

Last modified at 3:09:36 PM on Wed, Dec 28, 1988

Input Data

 BEAMAC II beam name: platform3b.
 Last modified at 3:09:36 PM on Wed, Dec 28, 1988.
 All distances are given in inch from the left end of the beam.

 Beam length is 1.07e+2 inch.

Node No.	Location inch	Support	Hinge
1	0.00e+0	none	No
2	2.17e+1	pin	No
3	8.53e+1	roller	No
4	1.07e+2	none	No

Element No.	From, To Nodes	Length inch	Section name	E psi
1	1,2	2.17e+1	---	1.00e+7
2	2,3	6.36e+1	---	1.00e+7
3	3,4	2.17e+1	---	1.00e+7

Element No.	Area in**2	Depth in	Iz in**4	Weight lb/in	Include self wt.
1	4.31	16.00	0.47	0.42	No
2	4.31	16.00	0.47	0.42	No
3	4.31	16.00	0.47	0.42	No

Concentrated Forces:

(none)

 Distributed Loads:

No.	L end at inch	R end at inch	MagX at L lb/in	MagY at L lb/in	MagX at R lb/in	MagY at R lb/in
1	0.00e+0	1.07e+2	0.00e+0	1.50e+1	0.00e+0	1.50e+1

 Applied Moments:

(none)

Output Data

BEAMAC II beam name: platform3b.

Last modified at 3:09:36 PM on Wed, Dec 28, 1988.

All distances are given in inch from the left end of the beam.

Maximum tension is 0.00e+0 lb; it occurs:

from x= 0.00e+0 inch to x= 1.07e+2 inch.

Maximum compression is -0.00e+0 lb; it occurs:

from x= 0.00e+0 inch to x= 1.07e+2 inch.

Maximum shear is 4.77e+2 lb; it occurs:

at x= 2.17e+1 inch.

Minimum shear is -4.77e+2 lb; it occurs:

at x= 8.53e+1 inch.

Maximum moment is 4.04e+3 lb-in; it occurs:

at x= 5.35e+1 inch.

Minimum moment is -3.54e+3 lb-in; it occurs:

at x= 2.17e+1 inch;

at x= 8.53e+1 inch.

The maximum upward deflection is approximately 1.35e-1 inch.

The maximum downward deflection is approximately 3.01e-1 inch.

Node deformations: (positive is to right, up, or counterclockwise.)

Node No.	Location inch	Delta-X inch	Delta-Y inch	Theta-Z radians
1	0.00e+0	0.00e+0	1.35e-1	-4.82e-3
2	2.17e+1	0.00e+0	0.00e+0	-1.03e-2
3	8.53e+1	0.00e+0	0.00e+0	1.03e-2
4	1.07e+2	0.00e+0	1.35e-1	4.82e-3

Support reactions: (pos. force is to right or up; pos. moment is ccw.)

Node No.	Location inch	Fx lb	Fy lb	Mz lb-in
2	2.17e+1	0.00e+0	8.02e+2	---
3	8.53e+1	---	8.03e+2	---

Points of internal force discontinuity:

From left inch	Tension on left lb	Tension on right lb	Shear on left lb	Shear on right lb	Moment on left lb-in	Moment on right lb-in
0.00e+0	---	0.00e+0	---	0.00e+0	---	0.00e+0
2.17e+1	0.00e+0	0.00e+0	-3.26e+2	4.77e+2	-3.54e+3	-3.54e+3
8.53e+1	0.00e+0	0.00e+0	-4.77e+2	3.26e+2	-3.54e+3	-3.54e+3
1.07e+2	0.00e+0	---	0.00e+0	---	0.00e+0	---

Deformation: (negative deflection is downwards; negative rotation is clockwise)

Location inch	Rotation radians	Deflection inch
2.17e+1	-1.03e-2	0.00e+0
8.53e+1	1.03e-2	0.00e+0
0.00e+0	-4.82e-3	1.35e-1
1.07e+1	-5.48e-3	8.12e-2
2.14e+1	-1.01e-2	3.25e-3
3.21e+1	-1.33e-2	-1.30e-1

4.28e+1	-8.61e-3	-2.53e-1
5.35e+1	0.00e+0	-3.01e-1
6.42e+1	8.61e-3	-2.53e-1
7.49e+1	1.33e-2	-1.30e-1
8.56e+1	1.01e-2	3.25e-3
9.63e+1	5.48e-3	8.12e-2
1.07e+2	4.82e-3	1.35e-1

TABLE NO. 23-A—UNIFORM AND CONCENTRATED LOADS

USE OR OCCUPANCY		UNIFORM LOAD ¹	CONCENTRATED LOAD
CATEGORY	DESCRIPTION		
1. Access floor systems	Office use	50	2000 ²
	Computer use	100	2000 ²
2. Armories		150	0
3. Assembly areas ³ and auditoriums and balconies therewith	Fixed seating areas	50	0
	Movable seating and other areas	100	0
	Stage areas and enclosed platforms	125	0
4. Cornices, marquees and residential balconies		60	0
5. Exit facilities ⁴		100	0 ⁵
6. Garages	General storage and/or repair	100	6
	Private or pleasure-type motor vehicle storage	50	6
7. Hospitals	Wards and rooms	40	1000 ²
8. Libraries	Reading rooms	60	1000 ²
	Stack rooms	125	1500 ²
9. Manufacturing	Light	75	2000 ²
	Heavy	125	3000 ²
10. Offices		50	2000 ²
11. Printing plants	Press rooms	150	2500 ²
	Composing and linotype rooms	100	2000 ²
12. Residential ⁷		40	0 ⁵
13. Rest rooms ⁸			
14. Reviewing stands, grandstands and bleachers		100	0
15. Roof deck	Same as area served or for the type of occupancy accommodated		
16. Schools	Classrooms	40	1000 ²
17. Sidewalks and driveways	Public access	250	6
18. Storage	Light	125	
	Heavy	250	
19. Stores	Retail	75	2000 ²
	Wholesale	100	3000 ²

¹See Section 2306 for live load reductions.

²See Section 2304 (c), first paragraph, for area of load application.

³Assembly areas include such occupancies as dance halls, drill rooms, gymnasiums, playgrounds, plazas, terraces and similar occupancies which are generally accessible to the public.

⁴Exit facilities shall include such uses as corridors serving an occupant load of 10 or more persons, exterior exit balconies, stairways, fire escapes and similar uses.

⁵Individual stair treads shall be designed to support a 300-pound concentrated load placed in a position which would cause maximum stress. Stair stringers may be designed for the uniform load set forth in the table.

⁶See Section 2304(c), second paragraph, for concentrated loads.

⁷Residential occupancies include private dwellings, apartments and hotel guest rooms.

⁸Rest room loads shall be not less than the load for the occupancy with which they are associated, but need not exceed 50 pounds per square foot.

Table 2
Minimum Uniformly Distributed Live Loads, L_o

Occupancy or Use	Live Load (lb/ft ²)	Occupancy or Use	Live Load (lb/ft ²)
Apartments (see residential)		Manufacturing:	
Armories and drill rooms	150	Light	125
Assembly areas and theaters:		Heavy	250
Fixed seats (fastened to floor)	60	Marquees and canopies	75
Lobbies	100	Office buildings:	
Movable seats	100	File and computer rooms shall	
Platforms (assembly)	100	be designed for heavier loads	
Stage floors	150	based on anticipated occupancy	
Balconies (exterior)	100	Lobbies	100
On one- and two-family residences		Offices	50
only, and not exceeding 100 ft ²	60	Penal Institutions:	
Bowling alleys, poolrooms, and		Cell blocks	40
similar recreational areas	75	Corridors	100
Corridors:		Residential:	
First floor	100	Dwellings (one- and two-family)	
Other floors, same as occupancy		Uninhabitable attics	
served except as indicated		without storage	10
Dance halls and ballrooms	100	Uninhabitable attics	
Decks (patio and roof)		with storage	20
Same as area served, or for the		Habitable attics and sleeping	
type of occupancy accommodated		areas	30
Dining rooms and restaurants	100	All other areas	40
Dwellings (see residential)		Hotels and multifamily houses	
Fire escapes	100	Private rooms and corridors	
On single-family dwellings only	40	serving them	40
Garages (passenger cars only)	50	Public rooms and corridors	
For trucks and buses use AASHTO*		serving them	100
lane loads (see Table 3 for con-		Schools:	
centrated load requirements)		Classrooms	40
Grandstands (see stadium and arena		Corridors above first floor	80
bleachers)		Sidewalks, vehicular driveways,	
Gymnasiums, main floors and		and yards, subject to trucking†	250
balconies	100	Stadium and arena bleachers‡	100
Hospitals:		Stairs and exitways	100
Operating rooms, laboratories	60	Storage warehouses:	
Private rooms	40	Light	125
Wards	40	Heavy	250
Corridors above first floor	80	Stores:	
Hotels (see residential)		Retail	
Libraries:		First floor	100
Reading rooms	60	Upper floors	75
Stack rooms — not less than §	150	Wholesale, all floors	125
Corridors above first floor	80	Walkways and elevated platforms	
		(other than exitways)	60
		Yards and terraces (pedestrians)	100

*American Association of State Highway and Transportation Officials.

†AASHTO lane loads should also be considered where appropriate.

‡For detailed recommendations, see American National Standard for Assembly Seating, Tents, and Air-Supported Structures, ANSI/NFPA 102-1978.

§The weight of books and shelving shall be computed using an assumed density of 65 lb/ft³ (pounds per cubic foot, sometimes abbreviated pcf) and converted to a uniformly distributed load; this load shall be used if it exceeds 150 lb/ft².

1/8 alum sheet

1/16 alum sheet

RAC 10/20/89

$$\begin{aligned} \text{TOTAL LOAD} &= \frac{60\#}{\text{ft}^2} \left(\frac{36 \times 107}{144} \right) \\ &= 60 \times 27 \text{ ft}^2 \\ &= 1620 \# \end{aligned}$$

ASSUME EACH ARM MUST CARRY 1/2 THE LOAD.

CHECK PLATE

@ A

$$M_{MAX} = 14580 \text{ in-lb}$$

$$I = \frac{1}{12} \left(\frac{1}{4} \right) \left(\frac{9 \frac{13}{16}}{2} \right)^3 = 19.7 \text{ in}^4$$

$$S = \frac{I}{\left(\frac{9 \frac{13}{16}}{2} \right)} = 4.01 \text{ in}^3$$

$$f_b = \frac{M}{S} = \frac{14580}{4.01} = 3.6 \text{ KSI}$$

$$F_{b \text{ tension}} = 0.6 F_y = 0.6 (36) = 21.6 \text{ OK}$$

Compression: (AISC 1.5.1.4.5)

$$\text{Compute } r_T = \frac{4.91}{3} = 1.64''$$

$$\begin{aligned} \text{Comp.} \\ \text{web} \\ \frac{9 \frac{13}{16}}{2} \\ = 4.91'' \end{aligned}$$

$$r_T = \sqrt{\frac{I}{A}} = \sqrt{\frac{\left(\frac{1}{12} \times \frac{1}{4} \right) \left(\frac{1.64}{} \right)^3}{\frac{1}{4} (1.64)}} = 0.47''$$

$$\frac{L}{r_T} = \frac{36}{.47} = 76.25$$

RDC 10/20/89

$$\sqrt{\frac{510 \times 10^3 C_b}{F_y}} = \sqrt{\frac{510 \times 10^3 (1)}{36}} = 119$$

$$\sqrt{\frac{102 \times 10^3 C_b}{F_y}} = 53.23$$

$$F_{bc} = \left[\frac{2}{3} - \frac{F_y (L/r_T)^2}{1530 \times 10^3 C_b} \right] F_y = \left[\frac{2}{3} - \frac{36 (76.25)^2}{1530 \times 10^3 (1)} \right] F_y$$

$$= 0.53 F_y = 19.1 (36)$$

$$F_{b, \text{comp}} = 19.1 \text{ ksi} > 3.6 \quad \underline{\text{OK}} \quad \underline{\underline{F.S. > 5}}$$

CHECK END LOAD OF 300 #

$$M = 300(36) = 10800 \text{ in-lb}$$

Less than design M. OK

Check Hinge.

$$F(17 \frac{3}{16}) = 14600$$

$$F = 2031 \text{ #}$$

Doc 10/20/89

Check $\frac{1}{4}$ " weld.

$$\text{length} = 2 \times 2" = 4"$$

$$\frac{2030 \#}{4"} = 510 \frac{\#}{\text{in}}$$

$$A_{\text{min}} = \frac{1}{4}"(.707) \times 1" = .177 \text{ in}^2$$

$$f_s = \frac{P}{A} = \frac{510}{.177} = 2.9 \text{ ksi}$$

$$F_s = 0.4 F_y = 0.4(36) = 14.4 \text{ ksi} \text{ OK}$$

$$F.S. \approx 5$$

Check shear @ hole

$$f_s = \frac{P}{A} = \frac{2030}{2(.938)(.235)} = \frac{2030}{.44 \text{ in}^2}$$

$$f_s = 4.6 \text{ ksi} < 14.4 \text{ OK}$$

the other $\frac{1}{2}$ of the hinge has the same area

Pin Shear

$$f_s = \frac{2030}{\frac{2\pi(\frac{1}{2})^2}{4}} = 5.2 \text{ ksi} < 14.4 \text{ OK}$$

$\therefore$ The supports have a large margin of safety.