CHAPTER 8 FINITE ELEMENT ANALYSIS

8.1 PURPOSE

The material presented in previous chapters has illustrated the potential of using STRUDL for the solution of structural problems. With the use of simple truss or frame members many structure systems of complicated geometries and loadings can be modelled and analyzed with reasonable accuracy. However, many complex two and three dimensional stress distribution systems simply can't be modeled satisfactorily with members alone. This modeling deficiency can be corrected with the use of the finite element capabilities available in the STRUDL systems.

The main purposes of this chapter are:

- to introduce the engineer to the different elements that are available in the STRUDL system.
- to discuss the basic concepts behind the finite element method.
- to illustrate the procedures, the pitfalls and the factors that affect the solution of the problem.
- to learn how to interpret the results of the finite element outputs.

They will be discussed and illustrated with simple example problems. The theoretical formulation of the finite element technique will not be presented. The reader who is interested in the subject should refer to the references that are listed at the end of this chapter.

8.2 PREREQUISITE

The basic understandings of the stiffness method of analysis and familiarity with the STRUDL commands are the prerequisites for a reasonable understanding of the material presented.

8.3 GENERAL

Finding a solution for the "real physical" problem is one of the main functions that an engineer faces. Generally, the solution procedure can be broken down to three basic steps. These are 1) mathematical modelling, 2) solution of the model and 3) interpretation of results.

1) Mathematical Modelling: This is the step where a "real physical" problem is reduced to a set of mathematical equations.

The "real physical" problem is generally very complex and contains many parameters that can affect its solution. In order to be able to handle the problem, an engineer uses ingenuity and

basic physical laws to simplify the problem and to derive a mathematical model. This is generally expressed in the form of a differential equation. Examples of some of these models are the beam theory, two dimensional elasticity problems of plane stress and plane strain, the thin plate theory, and three dimensional elasticity.

2) Solution of the Model: Once the model is obtained the next step is the solution of the mathematical equations inherent in the model. The complexity of the mathematical solution would depend greatly on the equations which represent the physical problem. Unfortunately, a more realistic model generally produces a more difficult set of equations to be solved. Classically, an engineer tends to derive a simple model with equations that can be solved analytically. However, engineers have been shifting toward the approximate numerical solution of equations because of the recent development of the digital computer. One of these numerical solution techniques is the finite element method. With the help of the digital computer and the finite element method, an engineer can now have a more realistic model of the "real physical" problem and solve the mathematical equations numerically in an approximate manner.

3) Interpretation of Results: After a "real physical" problem has been reduced to a simplified mathematical model and the equations solved, either analytically or numerically depending on the complexity of the equation, one has to interpret the results of the model. The solution of the model is by no means an exact solution of the "real physical" problem. The accuracy of the results would greatly depend on the validity of the assumptions made in the modelling process and the accuracy of the numerical solution of the model. These factors must be carefully evaluated before the results can be used. Generally, this is the step that most engineers overlook.

Figure 8.3.1 presents a flowchart that describes the procedure needed for the solution of a "real physical" problem.

8.4 THE FINITE ELEMENT METHOD

As discussed in the previous section, the finite element method is a general numerical technique used to solve a variety of mathematical equations of structural models in an approximate manner.

Structural engineers are interested in the effect of deformations, stresses, strains, etc. distributed on a structure. The effect of displacement depends on the forces applied to the structure or vice versa. The finite element procedure can be formulated in terms of displacement or force or a combination of both displacement and force as its primary unknown variable. STRUDL uses displacement, and this is known as a displacement formulation.

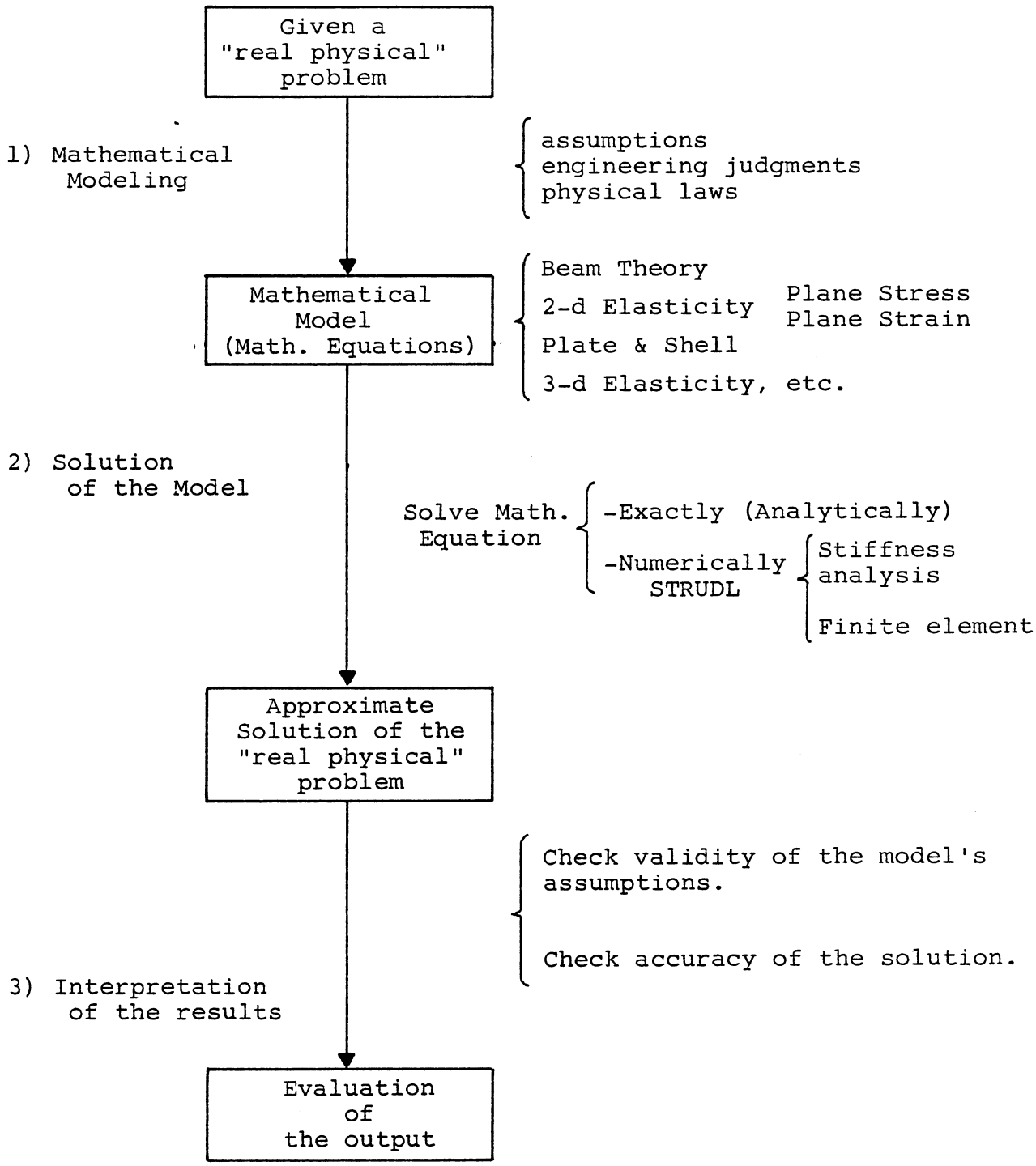
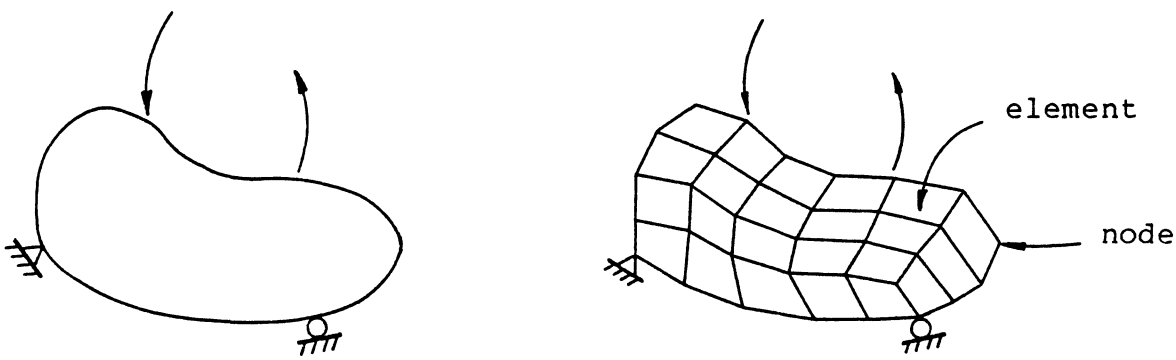


Figure 8.3.1, general flow chart for solution of engineering problem.

The unknown displacement on a structure is described continuously at any point of the structure. Hence, the problem is one of an infinite number of unknowns. The finite element procedure would reduce the problem to one of a finite number of unknowns. This is done by dividing the structure into a suitable number of smaller regions known as elements and expressing the unknown displacements on the nodes of the boundary of the elements. These nodal displacement unknowns then become the primary unknowns of the problem. Meanwhile, the unknown displacements inside of each element are approximated using an interpolation function (generally, a low order polynomial) expressed in terms of the nodal displacement.

Hence, the basic idea behind the finite element method is to replace the structural model with an assemblage of a finite number of elements which are interconnected at their nodal points. (See Fig. 8.4.1.)



(a) (b)

Fig. 8.4.1 (a) Continuous structural model.
(b) Finite element model.

The major advantage of this method is that it only takes one formulation for the development of the element. Once the element is developed, this can be used over and over to assemble the whole region of the problem approximating complicated geometry, loading and material properties.

The element can be one, two or three dimensional, with different geometrical shapes, different order of interpolation functions, different number of unknowns per node, and designed for application in the solution of different types of mathematical models (structural problems). Table 1 presents a summary of elements that are currently available in the STRUDL library. A more detailed description of these elements are given in the STRUDL user manual appendix, section G.

TABLE I, SUMMARY OF ELEMENTS THAT ARE CURRENTLY AVAILABLE IN THE STRUDL LIBRARY

	ELEMENT NAME	SHAPE	NO. OF NODES	D. O. F.	GENERAL RIGIDITY MATRIX	ELEMENT LOAD CAPABILITY	TEMPERATURE LOAD CAPABILITY	CONSISTENT INERTIA MATRIX	LUMPED INERTIA MATRIX	OUTPUT RESULTS	
										OUTPUT LOCATION	RESULTS AVAILABLE
PLANE STRESS - PLANE STRAIN ELEMENTS	CSTG		3	U_1, U_2	X		③	X	X	Centroid	ABC FG I
	PSR		4	U_1, U_2			③	X	X	Centroid	ABC FG I
	IPLQ		4	U_1, U_2	X		③	X	X	Nodes	B G I
	PSQ1*		4	U_1, U_2	X					Centroid	B G I
	LST		6	U_1, U_2	X			X	⑦	Nodes	AB FG I
	LSR		8	U_1, U_2	X			X		Nodes	B G I
	IPQQ		8	U_1, U_2	X		③	X	X	Nodes	B G I
	IPCQ		12	U_1, U_2	X		③	X	X	Nodes	B G I
	PSRCSH		4	U_1, U_2				X	X	Centroid	ABC FG I
	IPLQCSH		4	U_1, U_2	X		③	X	X	Nodes	B G I
	PSRR		4	U_1, U_2, U_6						Nodes	J
PLATE BENDING ELEMENTS	CPT		3	U_3, U_4, U_5	X	①	④	X	X	Nodes	D H I
										Centroid	E
	BPR		4	U_3, U_4, U_5	X	①	④	X	X	Nodes	DE H I
	BPP		4	U_3, U_4, U_5	X	①	④	X	X	Nodes	DE H I
	PBQ1*		4	U_3, U_4, U_5	X	①	④			Nodes	D H I
										Centroid	E

*Not recommended because of efficiency

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CONT. OF TABLE I

	ELEMENT NAME	SHAPE	NO. OF NODES	D. O. F.	GENERAL RIGIDITY MATRIX	ELEMENT LOAD CAPABILITY	TEMPERATURE LOAD CAPABILITY	CONSISTENT INERTIA MATRIX	LUMPED INERTIA MATRIX	OUTPUT RESULTS	
										OUTPUT LOCATION	RESULTS AVAILABLE
HYBRID ELEMENTS	SBCT		3	U_1, U_2, U_3, U_4, U_5	⑨	①	⑤	X	X	Nodes	D H I
										Centroid	AB EFG
	PBST2		3	$U_1, U_2, U_3, U_4, U_5, U_6$	⑨	②	⑤ ⑥	⑧	X	Centroid	ABCDEFGH I
	PBSQ2		4	$U_1, U_2, U_3, U_4, U_5, U_6$	⑨	②	⑤ ⑥	⑧	X	Centroid	ABCDEFGH I
SOLID ELEMENTS	TRIP		6	U_1, U_2, U_3	X		③	X	X	Nodes	B G
	IPLS		8	U_1, U_2, U_3	X		③	X	X	Nodes	B G
	IPQS		20	U_1, U_2, U_3	X		③	X	X	Nodes	B G
	IPLSCSH		8	U_1, U_2, U_3	X		③	X	X	Nodes	B G
CURVED SHELL ELEMENTS	SIPQ		8	U_1, U_2, U_3 α, β		⑩	⑪	X	X	Nodes Gauss Pts.	ABCDEFG
	SIPC		12	U_1, U_2, U_3 α, β		⑩	⑪	X	X	Nodes Gauss Pts.	ABCDEFG

① SURFACE FORCE (pressure) normal to the element plane only.

② SURFACE FORCE (pressure) normal to and in the element plane.

③ JOINT TEMPERATURE CHANGE only (Section 7.1.2.3)

④ JOINT TEMPERATURE GRADIENT only (Section 7.1.2.3)

⑤ JOINT TEMPERATURE CHANGE and GRADIENT (Section 7.1.2.3)

⑥ Element temperature rise and element temperature differential (Section 7.1.2.2)

⑦ Zero inertia at the corner nodes.

⑧ When consistent is requested, lumped is provided along with warning message. Small rotatory inertia terms are added to avoid zeros in the inertia matrix.

⑨ Unique matrices for plane stress and plate bending rigidities are not available.

⑩ Uniform or variable PRESSURE load on element faces (Section 7.1.4.2), DEAD LOAD (Section 7.1.3.6), and CENTRIFUGAL LOAD (Section 7.1.4.5).

⑪ JOINT TEMPERATURE CHANGE and JOINT TEMPERATURE GRADIENT Z LOCAL only.

A Principal Stresses
B Normal Stresses
C Stress Resultants
D Stress Couples
E Tranverse Shears
F Principal Strains
G In-Plane Strains
H Curvatures
I Stress/Strain Contour Plots
J Forces and Moments

U_1 = x translation
U_2 = y translation
U_3 = z translation
U_4 = x rotation
U_5 = y rotation
U_6 = z rotation
α, β = rotations about nodal local axes

In general, there may be several different elements designed for the solution of the same type of problem. For example, elements 'CPT,' 'BPR,' 'BPP' and 'PBQ1' are all designed for the solution of the plate bending problem. The selection of the appropriate element for a given type of problem would depend on the geometry, the loading, the expected physical behavior and the degree of accuracy required.

8.5 PROBLEMS INHERENT IN THE FINITE ELEMENT METHOD

As an approximate method of solution the finite element technique possesses some unique problems. These problems, which will be discussed briefly in this section and later illustrated with examples, are: 1) discretization of the geometry, 2) element aspect ratio, 3) compatibility at element interfaces, 4) element asymmetry and 5) incompatibility of stresses.

8.5.1 Discretization of the Geometry

The characteristic procedure of the finite element technique which reduces the infinite number of unknowns in the region of the problem to a finite number of nodal unknowns is known as discretization. This is accomplished by assembling the whole region of the problem with a suitable number of smaller regions known as elements.

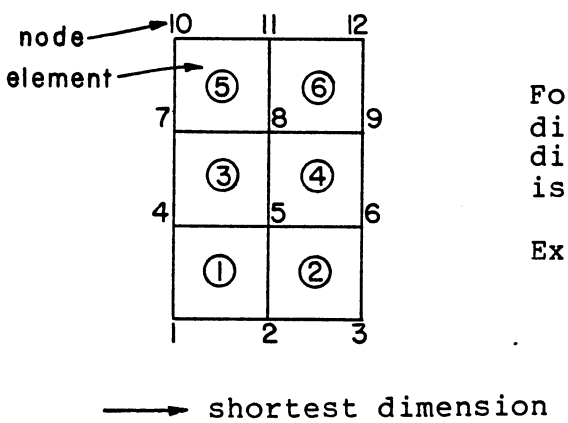
The process of discretization is one of the first problems that a user encounters. The immediate questions that one might ask are: how many elements are considered to be suitable, what shape of element must one use, where should the nodes be located, and what order of displacement interpolation function would be appropriate?

The accuracy of the finite element method greatly depends on the number of elements and the order of the displacement interpolation function. As a general rule, the greater the number of elements that is in a problem the better the accuracy of the solution, and the higher the order of the displacement interpolation function that exists in an element the less the number of elements that have to be used to achieve an accurate solution. The objective is to divide the model into small enough elements so that the relatively simple displacement interpolation function of the element can adequately approximate the deformation of the structure.

The selection of the element shape would greatly depend on the geometry of the problem. However, quadrilateral elements should be used whenever possible, except where triangular elements are needed to accommodate a grid refinement or because of the structure geometry.

The location of the nodes defines the element layout (mesh layout). This layout should be kept as close to uniform as possible. Nodes should be located at positions where there are abrupt changes in loading, geometry and material and at points where results are wanted.

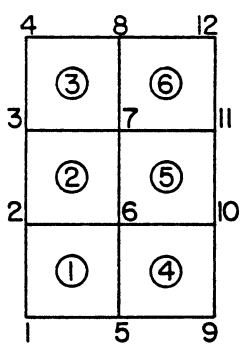
The numbering of the node is not very critical in STRUDL as long as the user makes use of the internal renumbering command [REDUCE BAND]. However, the bandwidth of the system can be minimized by numbering the nodes along the shortest dimension. The idea is to minimize the difference in the number of the diagonal nodes of each element.



For this case, the max. difference between diagonal for each element is 4.

Example: element 6 12-8 = 4

and



The max. number difference between diagonal for each element is 5.

Example: element 6 12-7 = 5

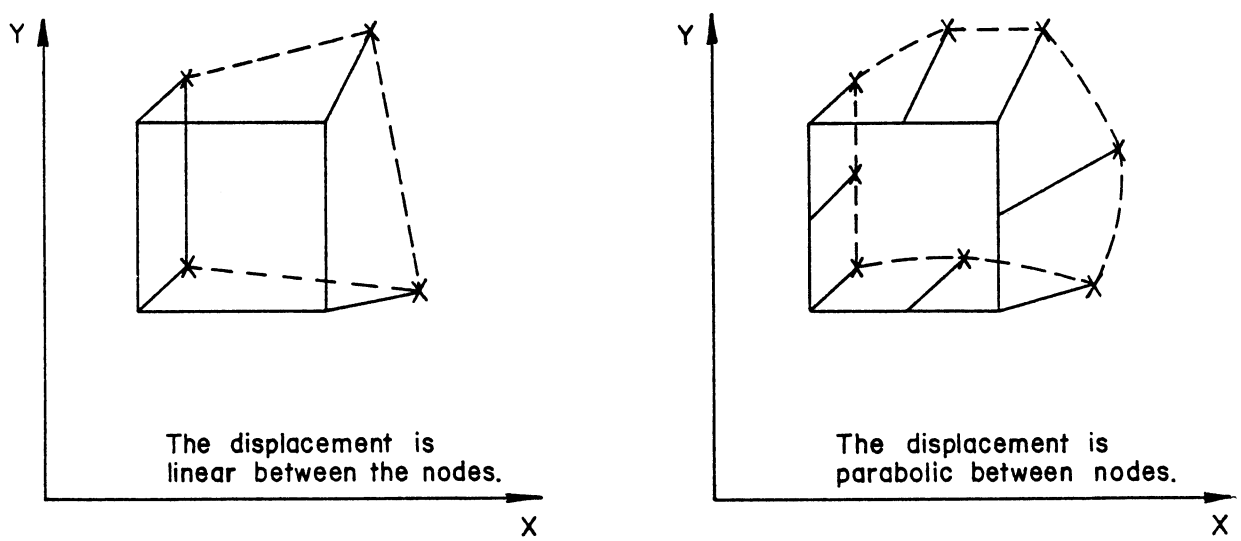
Therefore, the first case provided a smaller bandwidth.

8.5.2. Element Aspect Ratio

The aspect ratio is defined as the ratio of the largest dimension to the smallest of an element. Aspect ratio affects the accuracy of the solution. Generally, elements with aspect ratios near unity provide better accuracy and accuracy decreases as the element aspect ratio increases. As a general rule, aspect ratio should be kept below ten. Also the included angle between adjacent side of elements should not vary greatly from the 90° for the quadrilateral and 60° for the triangular element. In critical areas, this variation should be limited to ± 20° and in noncritical areas to ± 40°.

8.5.3 Compatibility at Element Interface

The variation of the unknown displacement along the boundaries and inside of an element is defined by an interpolation function expressed in terms of the nodal values. For a linear interpolation element the displacement along the boundary, between the nodes, is linear. Similarly, a quadratic interpolation element has its boundary displacement parabolic between the nodes. Figure 8.5.1 illustrates an example of the plane stress element.

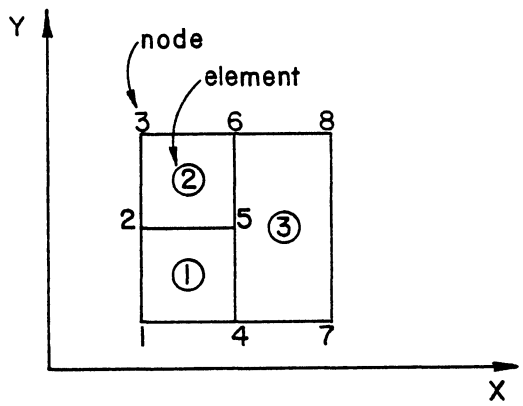


a) Linear interpolation element b) Quadratic interpolation element

Figure 8.5.1

The unknown nodal displacement value is always compatible for a displacement formulation finite element procedure. This means the displacement at a node is the same for all elements that are connected to it. However, along the interface of the elements incompatibility might occur if elements of different interpolation functions are used.

Suppose two linear interpolation plane stress elements and one quadratic interpolation element are formed as shown in Figure 8.4.3.

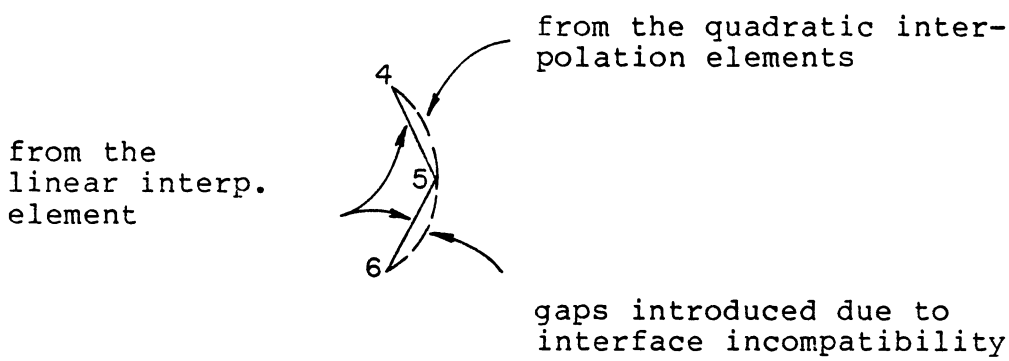


Elements 1 and 2 linear interpolation elements

Element 3 is a quadratic interpolation element.

Figure 8.4.3

The nodal displacement for joints 4, 5 and 6 will be compatible. But, along the interface in the line from joints 4 to 6 incompatibility is introduced.

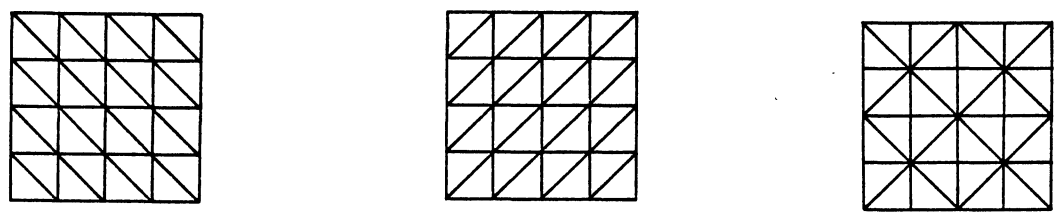


The result of this interface incompatibility is the gap or overlap introduced along the interface boundary. This in turn causes inaccuracy in the solution. Hence, to maintain compatibility along an element interface, elements with the same displacement interpolation function must be used.

8.5.4 Element Asymmetry

The triangular element possesses a unique asymmetry effect which is proportional to its aspect ratio. This problem should be considered when models are created using triangular elements in order to minimize or eliminate its effect.

Figure 8.5.2 shows three models of a plate using the same number of elements and nodal points. Model A and B will produce unsymmetrical results for symmetrical models because the element asymmetries are cumulative, in these cases along the diagonals. Model C, on the other hand, will produce symmetrical results since the element asymmetries tend to cancel one another.



Model A Model B Model C

Figure 8.5.2 Element Asymmetry

The effect of the element asymmetries are more pronounced for the plate bending element. Therefore, special consideration must be taken when triangular plate bending or hybrid elements are used.

8.5.5 Incompatibility of Stresses

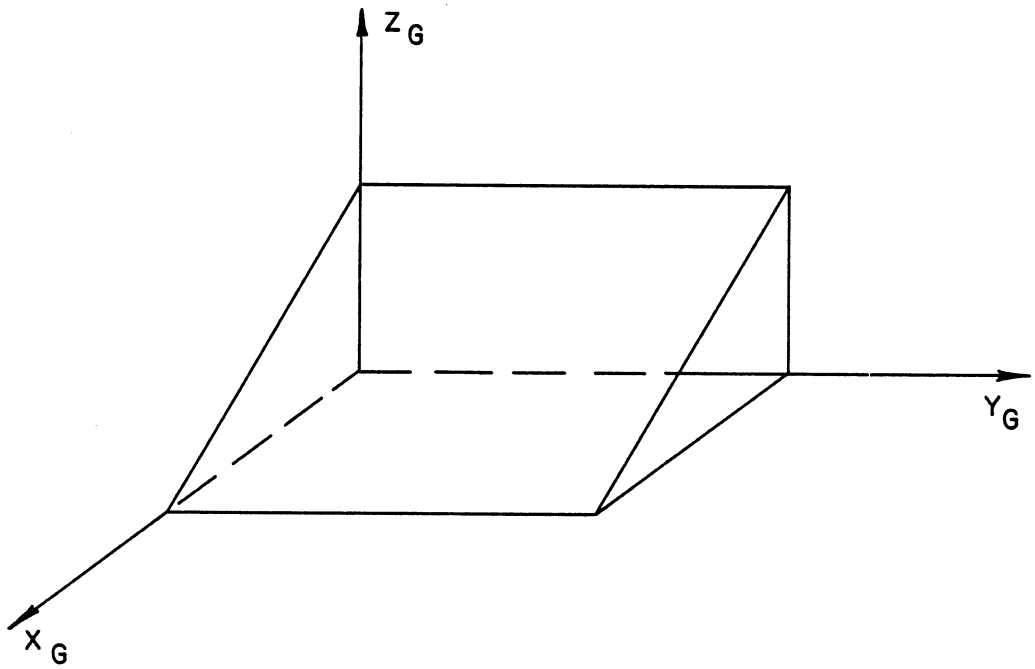
The STRUDL Finite Element is based on the displacement formulation, i.e., the nodal displacement is the primary unknown of the problem. The strain and stress within the problem are approximated and the predicted results at a node are generally not compatible. Hence, internal static equilibrium is not generally satisfied. However, the model displacement is always compatible.

8.6 COORDINATE SYSTEMS

The STRUDL Finite Element uses three different systems of coordinates. These are Global, Local and Planar coordinates systems.

8.6.1 Global Coordinate Systems

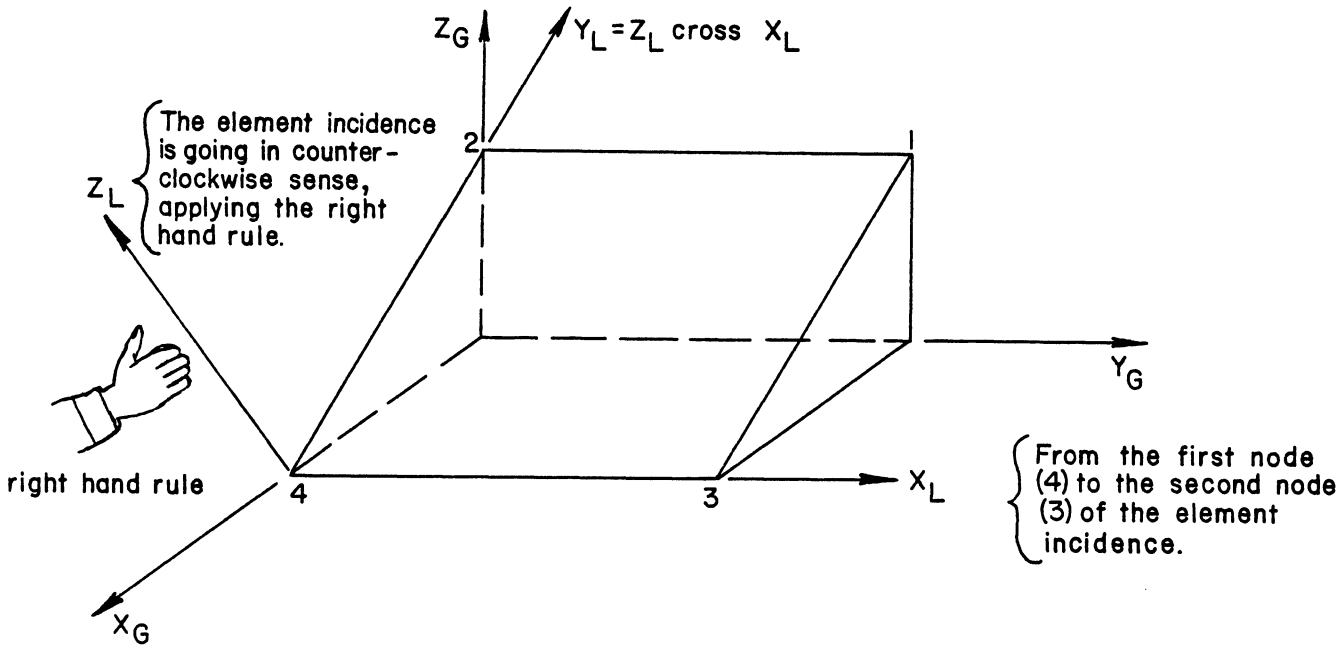
This coordinate system defines the overall structure. It is defined by the user and chosen in such a way that the major axes coincide with some of the major dimensions of the structure.



8.6.2 Element Local Coordinate System

This coordinate system is used to determine the planar coordinates. A local coordinate system is associated with each element. The element incidences and the node locations uniquely define the local coordinate.

The local X_L axis for an element is defined from the first node of the given element incidences to the second node given. The local Z_L axis is formed by applying the right-hand rule to the nodes given with the element incidences. The local Y_L axis is determined by applying the vector cross product of Z_L cross X_L.



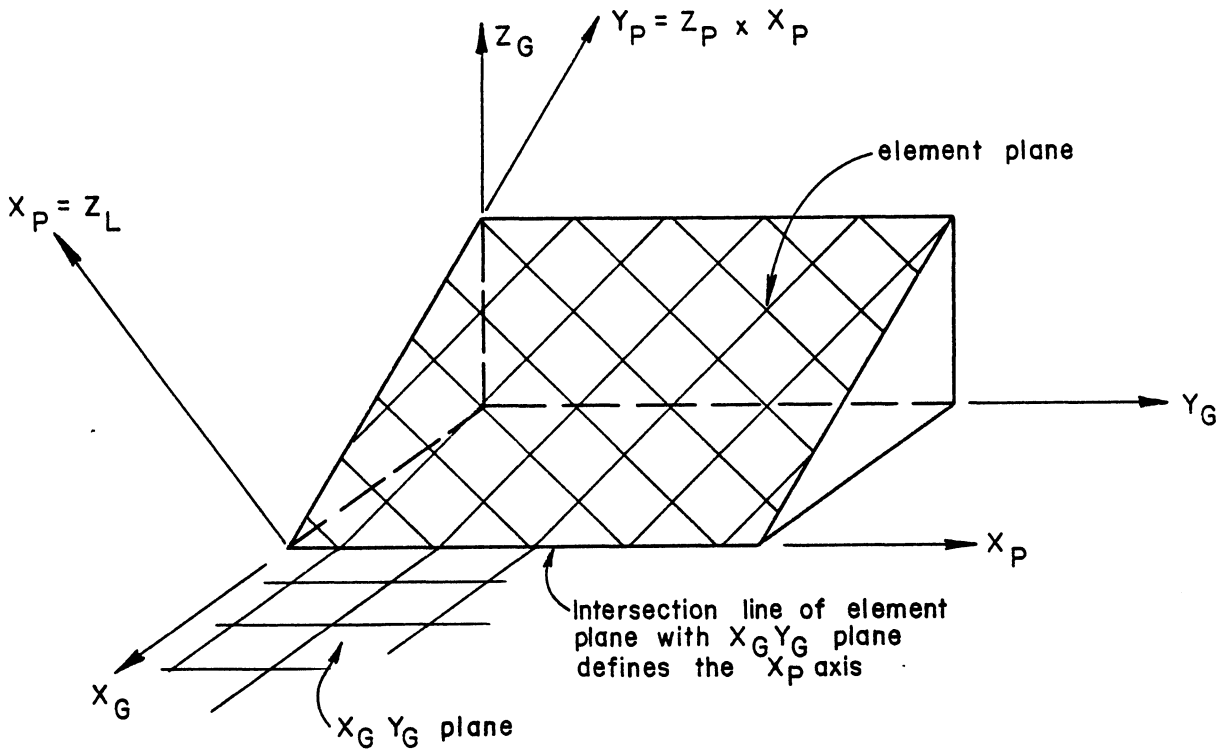
Element incidence is 4312

8.6.3 Element Planar Coordinate System

All elements in STRUDL except the tridimensional ones have their stress output in terms of the planar coordinates. The determination of this coordinate system depends on the local and global coordinates.

In general;

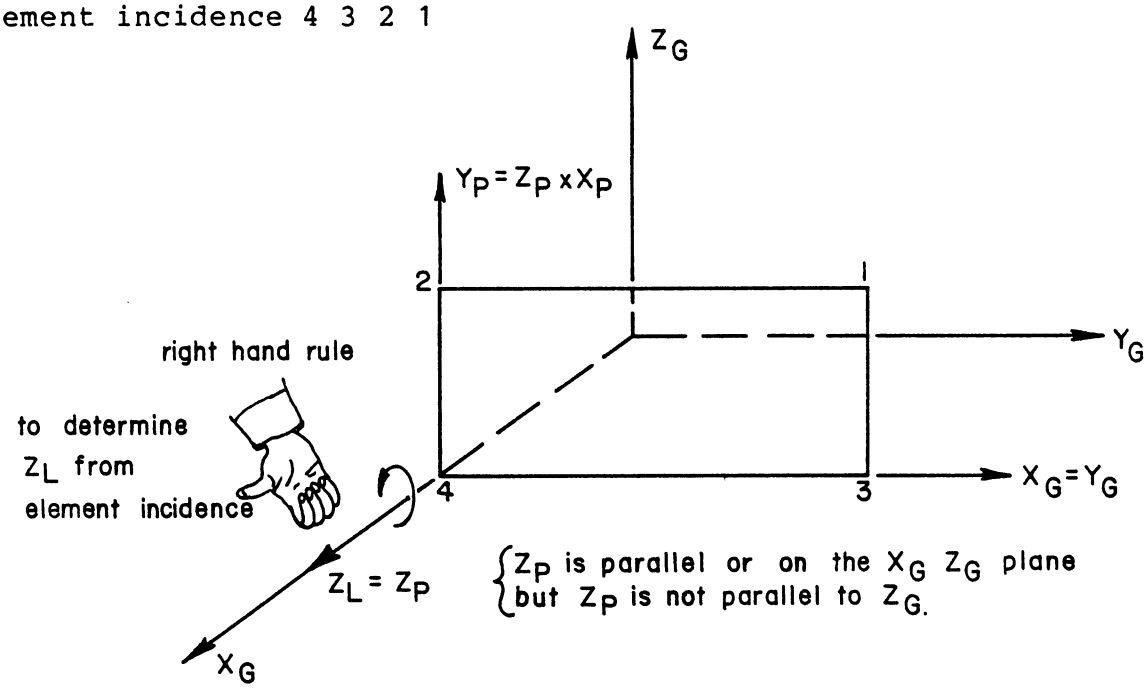
- the planar Z_p axis is the same as the local Z_L axis. (i.e., parallel and in the same positive direction)
- the planar X_p axis coincides with the intersection of the element plane and the global $X_G Y_G$ plane.
- the positive direction of X_p is such that its projection onto the global positive X_G is positive, except
- the projection of the planar X_p axis onto the global Y_G axis is defined to be positive in the same direction as the global Y_G axis.
- the planar Y_p axis is determined by applying Z_p cross X_p.



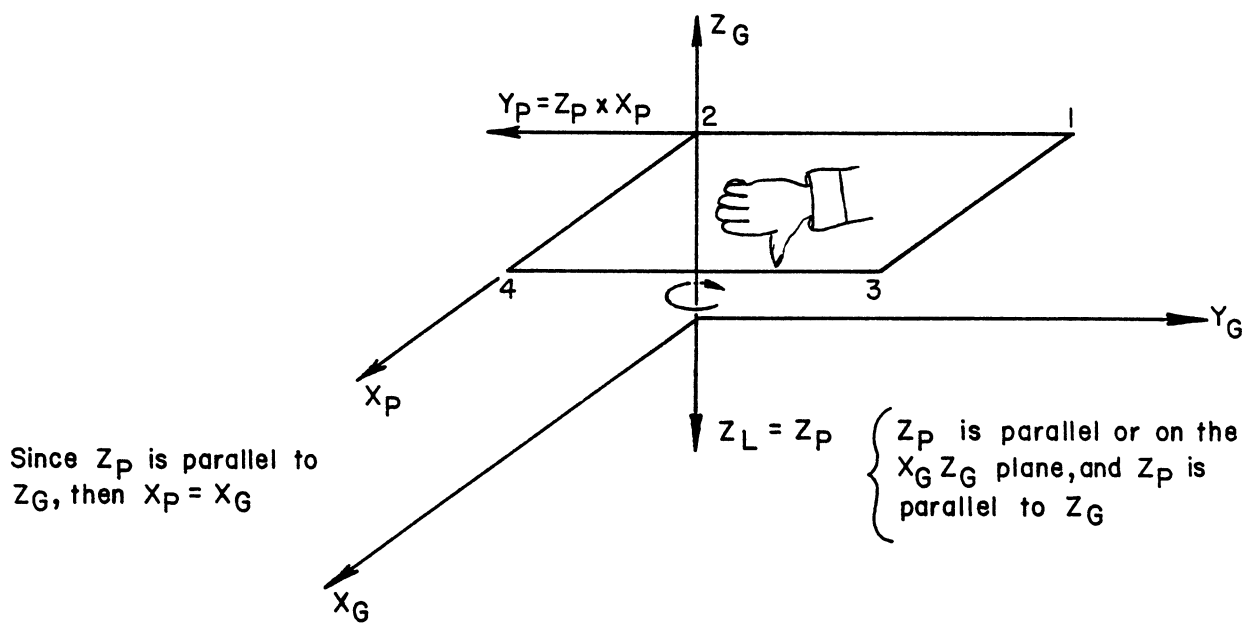
Above procedures uniquely define the planar coordinate system except when Z_L or Z_p lies in or is parallel to the Global X_G Z_G plane, then $X_p = Y_G$ and $Y_p = Z_p$ cross X_p.

Example:

Element incidence 4 3 2 1



Another exception is that when Z_L or Z_P lies in or is parallel to the Global $X_G Z_G$ plane and Z_P becomes parallel to Z_G, then $X_P = X_G$ and $Y_P = Z_P$ cross X_P



For Element incidence in 3 4 2 1

8.7 GENERAL STEPS NEEDED TO MODEL A PROBLEM USING STRUDL

In section 8.3 the typical engineering solution procedure to a "real physical" problem is discussed. In this section the application of the procedure to STRUDL coding is presented using the flowchart of Figure 8.3.1.

1) Select Mathematical Model and Initialize the Problem

Given the "real physical" problem the engineer has to decide what available engineering theories would best describe the problem. The selection of the type of mathematical structural model is described with the TYPE command. For the finite element analysis, STRUDL has elements for five types of models. These are plane stress, plane strain, plate bending, plate (shell) and three dimensional elasticity.

The following list of STRUDL commands is generally used in this step. The user should refer to the STRUDL user manual for the syntax of each command. The list by no means is a final one.

[STRUDL]
[UNIT]
[TYPE]

2) Discretize the Geometry and Select Elements

Once the type of mathematical model is chosen the next step is the solution of the model. For the finite element method the user has to discretize the geometry and select an appropriate element from the STRUDL library. The information of Section 8.5.1 would help. The user has to decide the mesh layout, element interpolation function, location of nodes, etc.

[MESH COORDINATES]
[MESH INCIDENCES]
[ELEMENT PROPERTIES]
[CONSTANTS]

3) Boundary Conditions

In order to solve a unique problem the user has to specify the boundary conditions. The commands [SUPPORT JOINTS] and [JOINT RELEASES] are used in this step.

4) Loading

In this step the applied loads are input. There might be joint loads, element loads and joint displacements. The STRUDL commands

[LOADING]
[JOINT LOADS]
[JOINT DISPLACEMENT]
[ELEMENT LOADS]

are used in this step.

5) Check input

Before the execution of the problem, the geometry, boundary conditions and loadings of the problem should be checked with the STRUDL commands

[PRINT] and [PLOT].

6) Assemble and Solve

Once the data is checked to be correct, the problem can be executed with the STRUDL command of

[STIFFNESS ANALYSIS REDUCE BAND]

7) Print Output and Interpretation of Results

The output of STRUDL run can be listed in many forms. The options [PRINT]
[LIST]
and [PLOT] are available.

The interpretation of the results is the hardest of all steps. The user must remember the element output location, the coordinate system used and also the units.

Since the finite element method is only an approximate solution of the mathematical equation, the accuracy of the solution is greatly affected by the number and order of the interpolation function used in the analysis. These and other factors discussed in Section 8.5 should be considered before a final judgment on the results is made.

GENERAL STEPS NEEDED TO MODEL A PROBLEM USING STRUDL

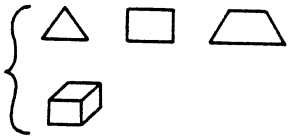
1) Select Mathematical Model

- determine the mathematical model that would best describe the physical problem. [TYPE]

2) Discretize the Geometry and Select Elements

- how many elements
- location of nodes
- shape of elements

Mesh layout



[MESH COORD
MESH INCIDENCE
ELEMENT PROP
CONST]

- unknown function within the element {Linear, quadratic cubic, etc.

3) Boundary Conditions [SUPPORT] [RELEASES]

4) Loading

- element loads depend on unknown function of the element

[LOADING]
[JOINT LOAD]
[JOINT DISPL]
[ELEMENT LOAD]

5) Check Input [PRINT] [PLOT]

6) Assemble and Solve [STIFFNESS ANALYSIS]

7) Print Output and Interpretation of Results

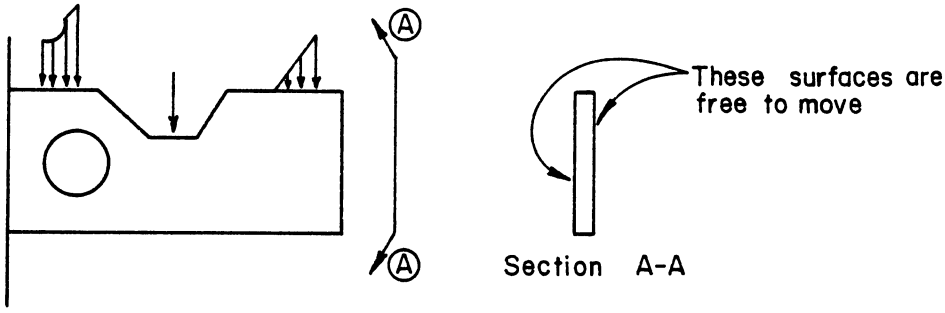
[LIST]
[PLOT]

8.8 PLANE STRESS/PLANE STRAIN ELEMENTS

These elements are used to model two dimensional elasticity problems. That is problem with geometry and loading that can be described with only two independent coordinates.

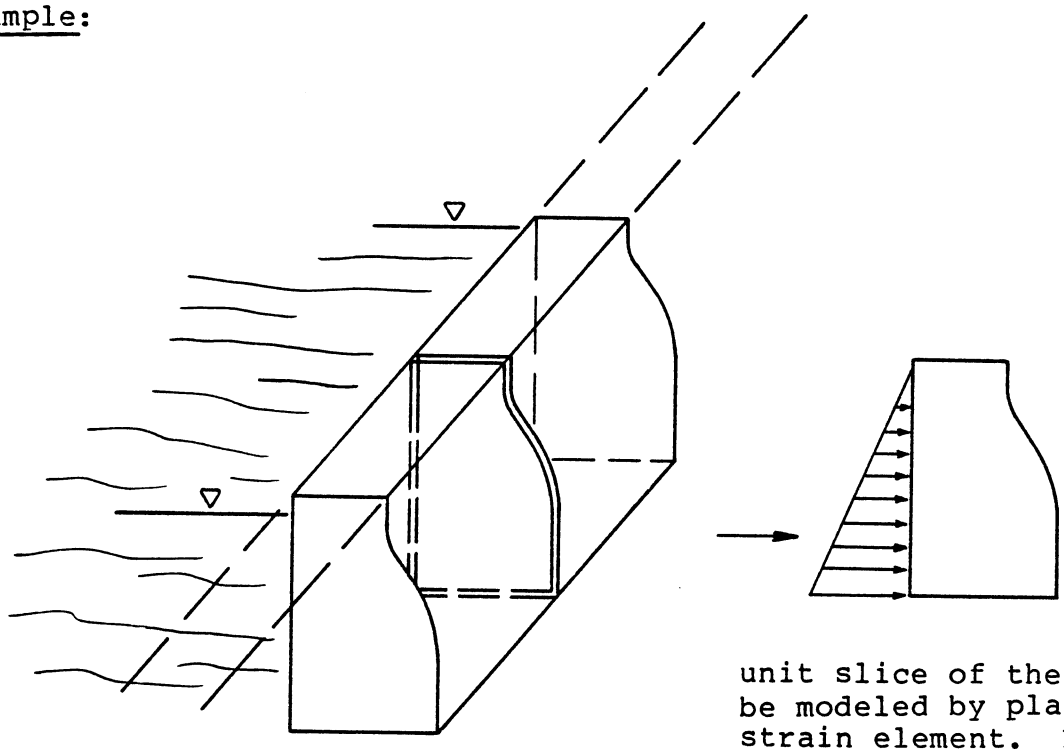
8.8.1 Plane Stress Element is used to model thin plate that is free to move in the direction normal to the plane of the plate.

Example: A flat plate subjected to in-plane loading.



8.8.2 Plane Strain Element is generally used to model a thin cut section of a very long solid structure, such as concrete dams or walls, whose geometry and loading are constants along the longest dimension. Plane strain element is not allowed to move in the normal direction of the element's plane.

Example:



Dam, of constants geometry and hydrostatic loading.

unit slice of the dam to be modeled by plane strain element. Due to symmetry, the element is not allowed to move in the normal direction of the element's plane.

8.8.3 Elements in STRUDL

There are a total of eleven types of element for the solution of plane stress or plane strain model (Table 1). The detailed description of each element type is given in Section G.2 of STRUDL user manual Appendix.

The plane stress or plane strain elements presented in Table 1 are arranged according to the order of the displacement interpolation function. For the linear displacement interpolation function elements there is the triangular element 'CSTG,' the rectangular element 'PSR' and the quadrilateral element 'IPLQ,' the 'PSRR' element is similar to the 'PSR' but includes an additional uncoupled third degree of freedom, which represents the effect of the in-plane rotational rigidity.

For the quadratic displacement interpolation function elements, the triangular element is 'LST,' the rectangular element is 'LSR' and the quadrilateral element is 'IPQQ.'

The element 'IPCQ' is the isoparametric quadrilateral cubic displacement interpolation function element.

Additionally, there are the 'PSRCSH' and 'IPLQCSH,' constant shear linear rectangular and quadrilateral elements. These elements are designed for use with flexure (bending) problem and keeping the displacement interpolation function linear.

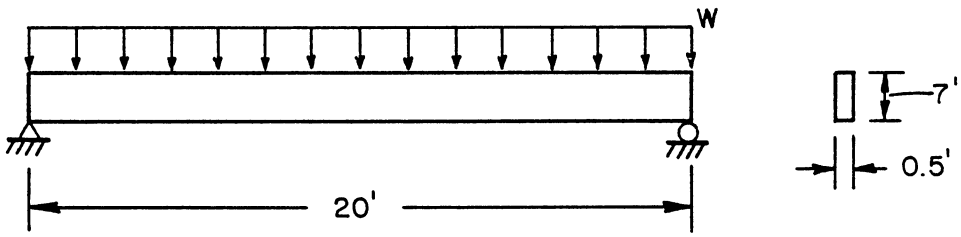
In general, the rectangular elements are more efficient than the quadrilateral ones; however, their usages are restricted to rectangular geometrical region.

The isoparametric elements, 'IPLQ,' 'IPQQ' and 'IPCQ' are very accurate and efficient and can be used for general geometrical region shape. The variation of the boundary (i.e., the shape of the element) for an isoparametric element is the same as the variation in the displacement interpolation function. This means that 'IPQQ' and 'IPCQ' elements can also be used to model curved boundaries region. Because of the flexibility and efficiency of the isoparametric elements, they should be used whenever possible.

8.8.4 Illustration

A simply supported beam under uniform load is used to illustrate the application of the STRUDL finite element capabilities. The steps presented in Section 8.7 will be used here.

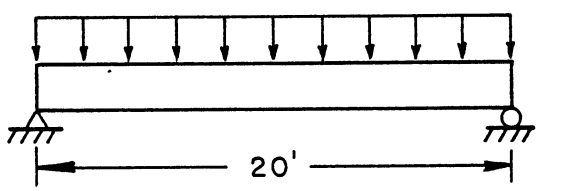
A simply supported beam under uniform load.

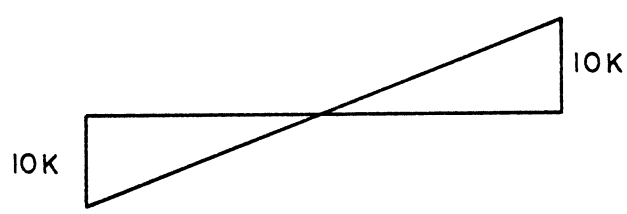


Find: { - Deflection at the center of span
- Stress at the quarter span

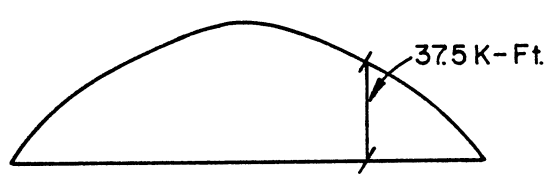
E = 4320000 KSF; υ = 0.3, W = 1 K/Ft

The beam solution (beam theory) of this problem is





shear diagram



moment diagram

Deflection at center of span: $\delta = -\frac{5}{384}\frac{L^4}{EI}$

$$= -\frac{5}{384}\frac{(1)(20)^4}{(4320000)(1/24)}$$

$$= \underline{-0.0116 \text{ Ft.}}$$

Moment at quarter span: $M = \underline{37.5 \text{ Ft.-K}}$

The stress $\sigma_{max} = \frac{My}{I} = \frac{37.5}{(1.24)}(0.5) = \pm 450$ KSF

Notice, the solution of this problem is symmetrical with respect to the center of span.

To solve this problem using STRUDL/FINITE ELEMENT, the steps outlined in Section 8.7 are followed:

1) Initialize and Select Mathematical Model:

This problem can be modeled as a plane stress problem. That is the beam and the loading can be described with only 2 independent coordinates; and the plane formed by the beam is allowed to move in the direction perpendicular to the plane.

Hence, the following STRUDL commands initialize and describe the type of problem.

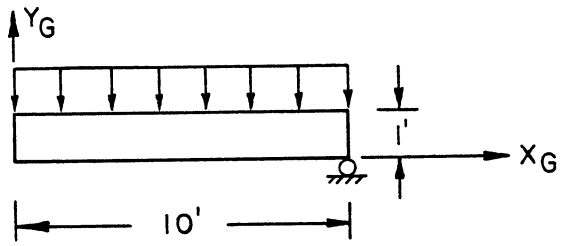
```
STRUDL 'A2' 'two elements'
UNIT KIP FEET
TYPE PLANE STRESS
```

The STRUDL command of TYPE PLANE STRESS will specify the type of mathematical model used in the analysis. The syntax of this command is explained in Section 6.1 of STRUDL user manual.

2) Discretize the Geometry and Select Element:

After the type of problem is defined, now the user has to decide how to discretize the geometry and what element to use.

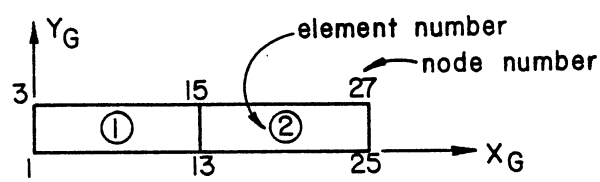
Before starting the discretization, the user should study the problem and see if there is any particular simplification. For this case, because of the geometry and loading symmetries, only half of the problem needs to be solved.



The selection of element depends on what is available in the STRUDL Library. For plane stress problem, there are a total of eleven different types of elements. As discussed in Section 8.8.3, let's use the isoparametric linear quadrilateral 'IPLQ' for this problem.

The number of elements and the location of nodes are harder to decide. The problem asks for displacement at the center span and stresses at the quarter span; hence, it is wiser to put nodes at those points since the 'IPLQ' element gives output at the nodes.

Therefore, let's use the following mesh layout.

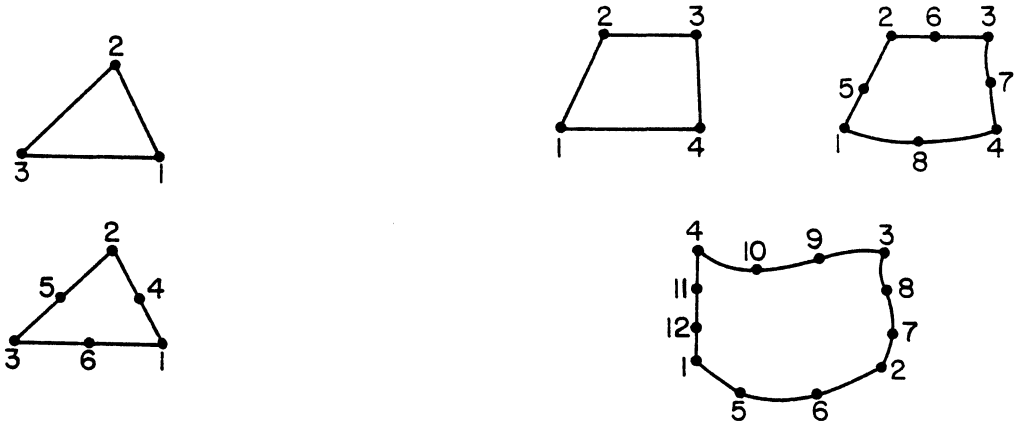


The following command can describe the location of joints with respect to the global coordinates.

```
MESH COORDINATES
1 TO 25 BY 12  X  0.  INCR 5.  Y  0.
3 TO 27 BY 12  X  0.  INCR 5.  Y  1.
```

The explanation of the MESH COORD. command is explained in Section 6.2.3 of STRUDL user manual.

The element incidences description depends on the type of element used. In general, for elements having only corner joints, the joints are listed consecutively around the lement boundary, starting at an arbitrary joint. For elements having side joints, the corner joints are listed first and then the side joints. The relative joint numbering schemes are shown on next page.



Triangular Elements Quadrilateral Elements

For this example, and using MESH INCIDENCES of Section 6.2.3 of STRUDL user manual, we have

```
MESH INCIDENCES
1,2 / 1,13 / 13,25 / 15,27 / 3,15
```

The material properties and type of element are defined by the following STRUDL commands.

```
ELEMENT PROPERTIES
  1 2 TYPE 'IPLQ' THICKNESS 0.5
CONSTANTS
  E 4320000. ALL
  POISSON 0.3 ALL
  G 1660000 ALL
```

3) Boundary Conditions:

For this particular problem, a line of symmetry is presented along joints 1 to 3; hence, for joint 1 and 3 displacement X_G is zero, while force in the global Y direction (shear force) is zero. At joint 25 a roller is presented. The following STRUDL commands are used to describe the boundary conditions.

```
SUPPORT JOINTS    1,3,25
JOINT    1,3    RELEASE FORCE Y
JOINT    25     RELEASE FORCE X
```

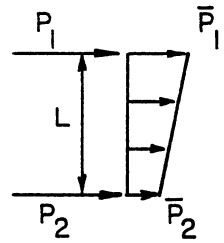
4) Loading:

The loading definition, joint load and joint displacement are the same as discussed in previous chapters.

The plane stress and plane strain elements do not generate internal joint loads from the surface forces acting on their exterior boundaries or surfaces. Hence, the user must convert these surface forces into consistent element joint loads.

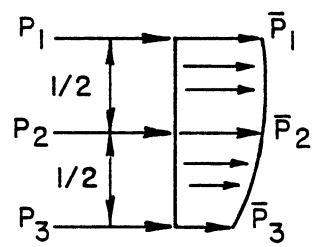
The joint loads depend on the form of the assumed displacement interpolation function. Let P_1, P_2,... be the equivalent joint loads for each element and $\overline{P}_1$, $\overline{P}_2$,... be the load intensities. The following formulas are used to determine the appropriate consistent equivalent joint loads.

a) Linear displacement interpolation function (CSTG, PSR, PSRR, IPLQ, IPLQCSH, PSRCSH)



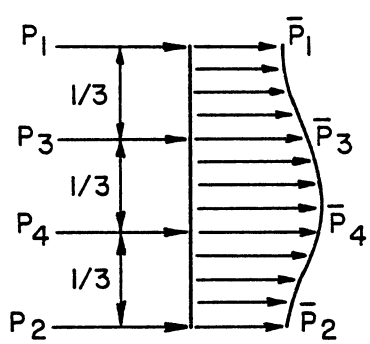
$$\begin{Bmatrix} P_1 \\ P_2 \end{Bmatrix} = \text{(Simple beam end reactions)}$$

b) Quadratic displacement interpolation function (LST, LSR, IPQQ)



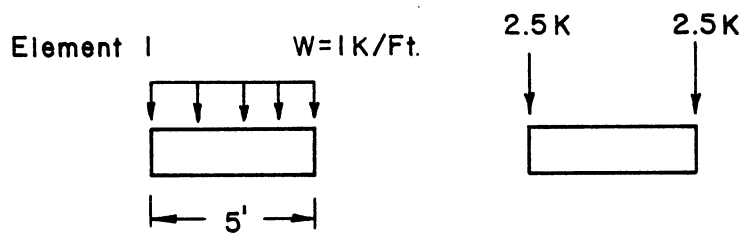
$$\begin{Bmatrix} P_1 \\ P_2 \\ P_3 \end{Bmatrix} = \frac{L}{30} \begin{bmatrix} 4 & 2 & -1 \\ 2 & 16 & 2 \\ -1 & 2 & 4 \end{bmatrix} \begin{Bmatrix} \overline{P}_1 \\ \overline{P}_2 \\ \overline{P}_3 \end{Bmatrix}$$

c) Cubic displacement expansion (IPLQ)



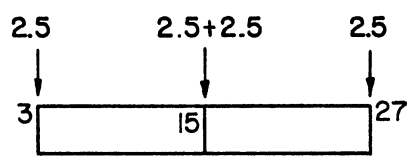
$$\begin{Bmatrix} P_1 \\ P_2 \\ P_3 \\ P_4 \end{Bmatrix} = L \begin{bmatrix} 0.0762 & 0.0113 & 0.0589 & -0.0214 \\ 0.0113 & 0.0762 & -0.0214 & 0.0589 \\ 0.0589 & -0.0214 & 0.3857 & -0.0482 \\ -0.0214 & 0.0589 & -0.0482 & 0.3857 \end{bmatrix} \begin{Bmatrix} \bar{P}_1 \\ \bar{P}_2 \\ \bar{P}_3 \\ \bar{P}_4 \end{Bmatrix}$$

For this example, W = 1 K/Ft., and for 'IPLQ'



Simple beam reaction: $1 \frac{K}{Ft.} * \frac{5}{2}$ Ft. $= \frac{5}{2}$ K = 2.5 K

Same for element 2, hence, the total applied joints loads are:



Hence, the following STRUDL commands are used to input the loading.

```
LOADING  1  'UNIFORM LOAD'
JOINT  3  27    LOAD FORCE Y -2.5
JOINT  15       LOAD FORCE Y -5
```

5) Check Input

Before executing the problem, the geometry, boundary conditions and loading should be checked. This can be done with the PRINT and PLOTTING commands of STRUDL.

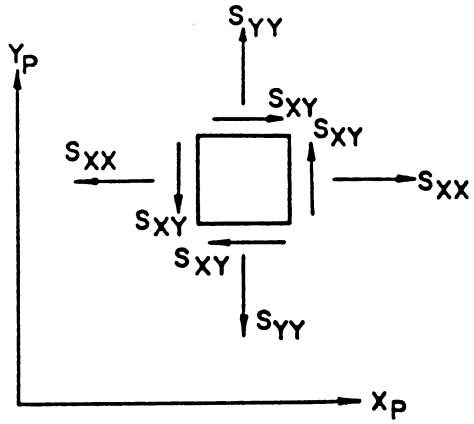
6) Assemble & Solve

Once the inputs are checked, the model can be analyzed. This is done by using the [STIFFNESS ANALYSIS] command.

7) Print Output and Interpretation of Results

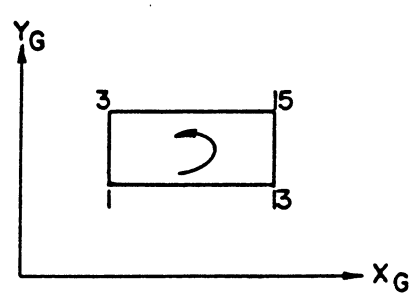
The output available for the plane stress and plane strain elements consists of the stress and strain components referred to the planar coordinates.

The positive sign convention for stress and strain is as follows.

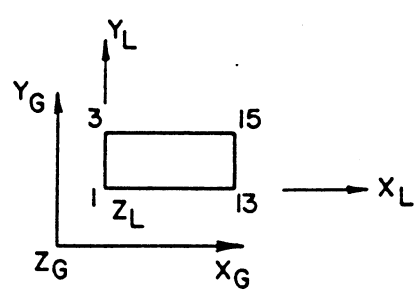


As discussed in Section 8.6, the planar coordinate is defined by the local coordinate which in turn depends on the element incidences and the Global coord.

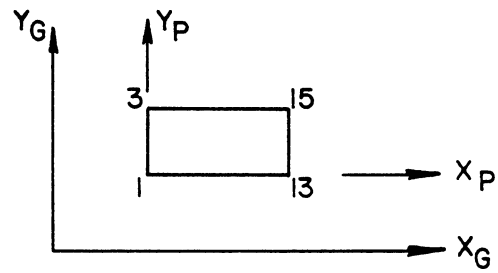
For this example, element 1 has incidences of 1 13 15 3



hence, the local coordinate X_L is from joint 1 to 13, applying the right hand rule the Z_L is the same as the Z_G, finally by operating Z_L cross X_L the Y_L is obtained.



The planar coordinate Z_P is equal to Z_L, and since Z_P is parallel to Z_G, then X_P is the same as X_G, and $Y_P = Z_P \times X_P$



For this example, the planar coordinate coincides with the global coordinate.

Following is the computer output which includes the printout, and listing of stresses and displacements.

```
STRUDL 'A2'   'TWO ELEMENTS'
*****************************************************************
*                                                               *
*   MCAUTO STRUDL                          RELEASE 4.5  APR 1981  *
*   MCAUTO STRUDL DYNAL                    RELEASE 6.5            *
*   MCAUTO STRUDL PLOTS                    RELEASE 3.5            *
*                                                               *
*                                                               *
*                    TIME 17.05.17,  1/29/82                    *
*                                                               *
*                  DATA POOL SIZE   30640 BYTES                 *
*                                                               *
*****************************************************************


UNIT KIP FEET                $ BDEROCBSM1

$ SPECIFY TYPE OF PROBLEM (STRUCTURAL SPECIFICATION)  P 6.1

TYPE PLANE STRESS

$ DISCRETIZATION OF THE GEOMETRY  P  6.86

MESH COORDINATES

   1  TO 25  BY  12  X  0.  INCR  5.  Y  0.

   3  TO 27  BY  12  X  0.  INCR  5.  Y  1.

MESH INCIDENCES

   1  2  /  1  13  /  13  25  /  15  27  /  3  15

$ DEFINE TYPE OF ELEMENT  P G.2

ELEMENT PROPERTIES

   1    2  TYPE 'IPLQ'  THICKNESS  0.5

CONSTANTS

   E  4320000.  ALL

   POISSON  0.3 ALL

   G  1660000.  ALL

$ BOUNDARY  CONDITIONS
```

PAGE - 3

```
SUPPORT JOINTS  1  3  25
   JOINT 1  3  RELEASE FORCE Y
   JOINT 25    RELEASE FORCE X
$ LOADING   P 7.23
LOADING 1  'UNIFORM LOAD'
   JOINT  3  27  LOAD FORCE Y  -2.5
   JOINT 15      LOAD FORCE Y  -5.
PRINT STRUCTURAL DATA
```

PAGE - 4

```
****************************************
*  PROBLEM DATA FROM INTERNAL STORAGE  *
****************************************

JOB ID -  A2          JOB TITLE - TWO ELEMENTS

ACTIVE UNITS -  LENGTH        FORCE       ANGLE      TEMPERATURE     TIME        MASS
                  FEET         KIPS         RAD          FAHR          SEC         LBM


         ********** STRUCTURAL DATA **********


JOINT COORDINATE REFERENCE SYSTEMS ------------------------------------------/
ID.    ORIGIN  X          Y          Z   ROTAT. R1         R2         R3


JOINT COORDINATES-----------------------------------------/  STATUS---/
JOINT            X           Y           Z     CONDITION

1               0.0         0.0         0.0     SUPPORT    ACTIVE       GLOBAL
13              5.000       0.0         0.0                ACTIVE       GLOBAL
25             10.000       0.0         0.0     SUPPORT    ACTIVE       GLOBAL
3               0.0         1.000       0.0     SUPPORT    ACTIVE       GLOBAL
15              5.000       1.000       0.0                ACTIVE       GLOBAL
27             10.000       1.000       0.0                ACTIVE       GLOBAL


JOINT RELEASES-----------------------------------/ELASTIC SUPPORT RELEASES-----------------------------------------------/
JOINT   FORCE  MOMENT   THETA 1  THETA 2  THETA 3     KFX         KFY         KFZ         KMX         KMY         KMZ
1         Y              0.0      0.0      0.0        0.0         0.0         0.0         0.0         0.0         0.0
25      X                0.0      0.0      0.0        0.0         0.0         0.0         0.0         0.0         0.0
3         Y              0.0      0.0      0.0        0.0         0.0         0.0         0.0         0.0         0.0


ELEMENT INCIDENCES-----------------------------------------------------------------------/--STATUS--/-----/----TYPE----/
ELEMENT              NODES

1          1        13        15        3                                                ACTIVE        IPLQ
2          13       25        27        15                                               ACTIVE        IPLQ


ELEMENT PROPERTIES-----------------------------------------------------------------------------------------------------/
```

```
                                                                                                                    PAGE -        5

ELEMENT    TYPE  THICKNESS   /--------CURVATURES--------/ /--------------THERMAL EXPANSION COEFFICIENTS---------------/
                               K1        K2        K12       CAX       CAY       CAZ       CSXY      CSXZ      CSYZ


1        IPLQ       0.500
2        IPLQ       0.500

MEMBER CONSTANTS-----------------------------------------------------------------------------------------------------/
CONSTANT   STANDARD VALUE   DOMAIN          VALUE       MEMBER LIST


   E         0.432000E+07    ALL

   G         0.166000E+07    ALL

DENSITY      0.172800E+04    ALL

  CTE        0.100000E+01    ALL

  BETA       0.0             ALL

POISSON      0.300000E+00    ALL



****************************************
*  END OF DATA FROM  INTERNAL STORAGE  *
****************************************

                                                                                                                    PAGE -        6


$ EXECUTE

STIFFNESS ANALYSIS REDUCE BAND



LIST DISPLACEMENT STRESSES REACTIONS ALL
```

PAGE - 10

```
****************************
*RESULTS OF LATEST ANALYSES*
****************************


 PROBLEM - A2        TITLE - TWO ELEMENTS

 ACTIVE UNITS  FEET KIPS RAD  FAHR SEC  LBM


LOADING - 1            UNIFORM LOAD

/-ELEMENT-//-------------------------------------------------------------------------------------------------------------/

 1        NODE   1          SXX  0.534390E+02   SYY  0.142551E+02   SXY  0.991357E+02
                 13         SXX  0.542532E+02   SYY  0.169690E+02   SXY -0.893257E+02
                 15         SXX -0.534391E+02   SYY -0.153387E+02   SXY -0.891356E+02
                 3          SXX -0.542532E+02   SYY -0.180526E+02   SXY  0.993257E+02

 2        NODE   13         SXX  0.244455E+02   SYY  0.802666E+01   SXY  0.557039E+02
                 25         SXX  0.217086E+02   SYY -0.109639E+01   SXY -0.250653E+02
                 27         SXX -0.244452E+02   SYY -0.149425E+02   SXY -0.257039E+02
                 15         SXX -0.217083E+02   SYY -0.581948E+01   SXY  0.550653E+02
```

LOADING - 1 UNIFORM LOAD

SUPPORT JOINT REACTION LOADS LOADING - 1

JOINT		FORCE X FORCE	FORCE Y FORCE	FORCE Z FORCE	MOMENT X MOMENT	MOMENT Y MOMENT	MOMENT Z MOMENT
1	GLOBAL	-49.9999847	-0.0000000				
25	GLOBAL	0.0000000	9.9999990				
3	GLOBAL	49.9999847	0.0				

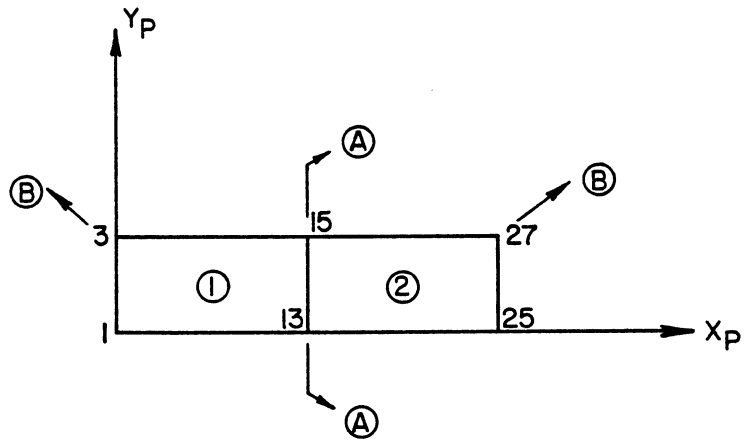
RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
1	GLOBAL	0.0	-0.0010331				
25	GLOBAL	0.0000824	0.0				
3	GLOBAL	0.0	-0.0010335				

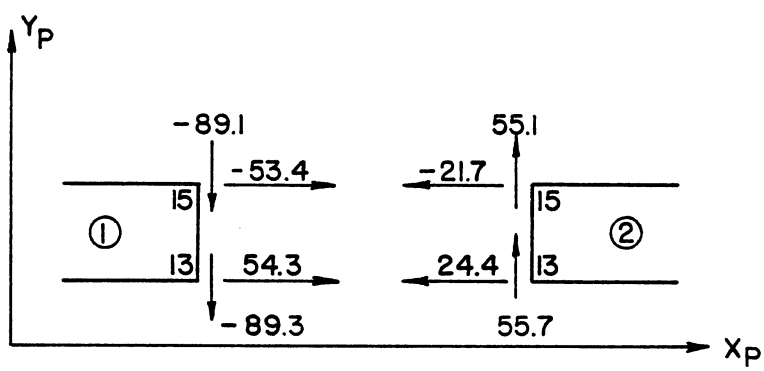
RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
13	GLOBAL	0.0000569	-0.0007348				
15	GLOBAL	-0.0000565	-0.0007346				
27	GLOBAL	-0.0000796	-0.0000018				

Output of Stresses



Along Section A-A: The normal stress S_{xx} and shear stress S_{xy} are present; however, S_{yy} does not come in. Following the positive stress sign convention.



As explained in Section 8.5.5, internal equilibrium of stresses is not generally satisfied in the finite element analysis. In order to obtain a nodal stress value an average scheme is used.

Hence, for joint 15 the average normal stress S_{xx} is

$$S_{xx_{15}} = \frac{-53.4 - 21.7}{2} = -37.55 \text{ KSF}$$

Similary for joint 13

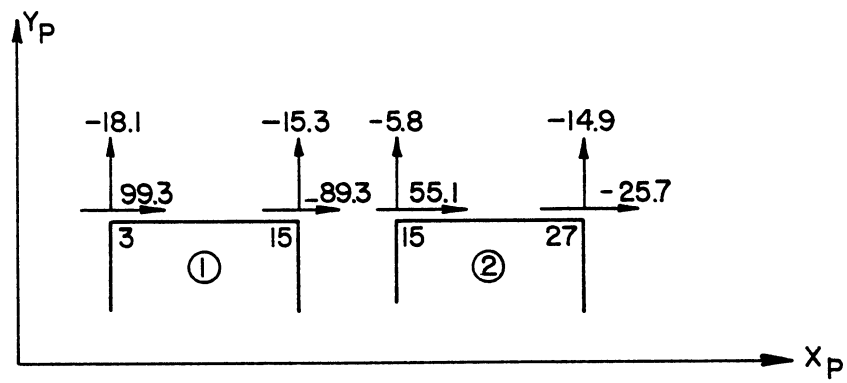
$$S_{xx_{13}} = \frac{54.3 + 24.4}{2} = 39.4 \text{ KSF}$$

The shear stresses, S_{xy} are

$$S_{xy_{15}} = \frac{-89.1 + 55.1}{2} = -17.0 \text{ KSF}$$

$$S_{xy_{13}} = \frac{-89.3 + 55.7}{2} = -17.0 \text{ KSF}$$

Along Section B-B the normal stress is S_{yy}, and the shear stress is S_{xy}. The stress, S_{xx} is not present along this face.



Average nodal stresses:

$$S_{yy_3} = -18.1, \; S_{yy_{15}} = \frac{-15.3 - 5.8}{2} = -10.6, \; S$$

$$S_{xy_3} = 99.3, \; S_{xy_{15}} = \frac{-89.3 + 55.1}{2} = -17.1, \; S$$

Displacement Output:

The displacements are output at the joint in terms of the global coordinates.

At joint 1 displacement y = -0.0010331 ft

At joint 3 displacement y = -0.0010335 ft

Comparison of Results

The results from this example of using 2 'IPLQ' elements do not compare well with the beam theory solution. The table below shows the percent differences.

	2 IPLQ	Beam Theory	%
Displ. @ Joint 1	0.001033'	0.0116'	91
Max stress @ Joint 1 s_{xx}	37.6 KSF	450 KSF	92

This means that the finite element solution is around 90 percent off the beam theory solution.

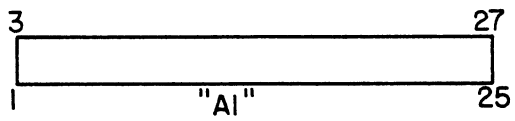
There might be several reasons for this inaccuracy. First of all, more elements probably should be used in order to better approximate the problem. Secondly, a higher order displacement interpolation function element might provide a more accurate answer.

In order to check this, several runs with a different mesh layout and different order of elements are executed. Figure 8.8.4.1 shows the mesh layout that was considered.

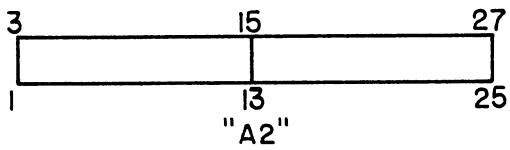
The 'IPLQ' and 'IPLQCSH' elements were used for the mesh layout 'A1,' 'A2,' 'A4,' 'A8,' 'B2,' 'B4' and 'B8.' While the quadratic element 'IPQQ' was applied to the 'A1,' 'A2,' 'A4' and 'AB' mesh layout. Only the 'A1' mesh layout is used for the 'IPCQ' cubic element.

The results of all these runs are summarized in Table 8.8.4.2. Also a plot of the % of beam theoretical deflection at center of span vs. the number of elements used is shown in Figure 8.8.4.3.

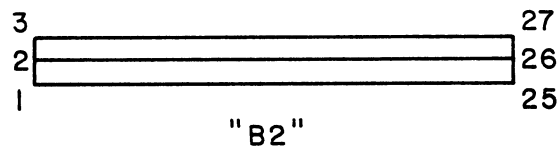
Mesh layout used for the example of S.S. beam. (Due to symmetry, only half of the beam needs to be discretized.)



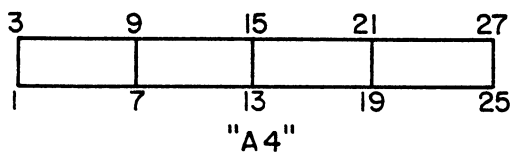
for IDLQ, IPLQCSH, IPQQ, IPCQ



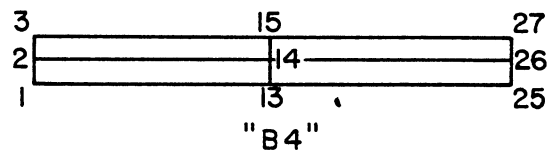
for IPLQ, IPLQCSH, IPQQ



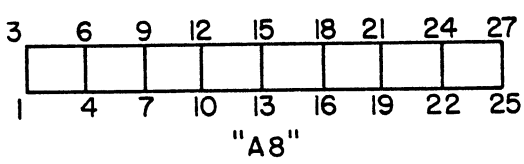
for IPLQ, IPLQCSH



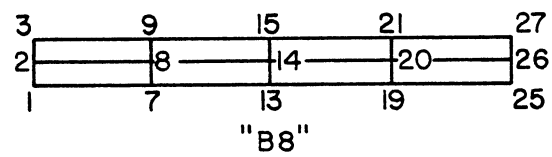
for IPLQ, IPLQCSH, IPQQ



for IPLQ, IPLQCSH



for IPLQ, IPLQCSH, IPQQ



for IPLQ, IPLQCSH

Figures 8.8.4.1

Table 8.8.4.2

Results of Deflection and Stress

Grid	Element Aspect Ratio L/h	Element 'IPLQ' ℄ Defl.	Element 'IPLQ' σ_x @ L/4	Element 'IPLQCSH' ℄ Defl.	Element 'IPLQCSH' σ_x @ L/4	Element 'IPQQ' ℄ Defl.	Element 'IPQQ' σ_x @ L/4	Element 'IPCQ' ℄ Defl.	Element 'IPCQ' σ_x @ L/4
'A1'	10:1	0.0002	8.	0.0064	300.	0.0096	400.7	0.0116	409.
'A2'	5:1	0.0010	39.	0.0095	376.	0.0112	424.6	—	—
'B2'	20:1	0.0002	8.	0.0068	307.	—	—	—	—
'A4'	2.5:1	0.0033	135.	0.0103	431.	0.0115	449.3	—	—
'B4'	10:1	0.0010	38.	0.0102	385.	—	—	—	—
'A8'	1.25:1	0.0068	288.	0.0105	445.	0.0116	450.	—	—
'B8'	5:1	0.0034	131.	0.0111	439.	—	—	—	—
BEAM SOLUTIONS		0.0116	450.	0.0116	450	0.0116		0.0116	

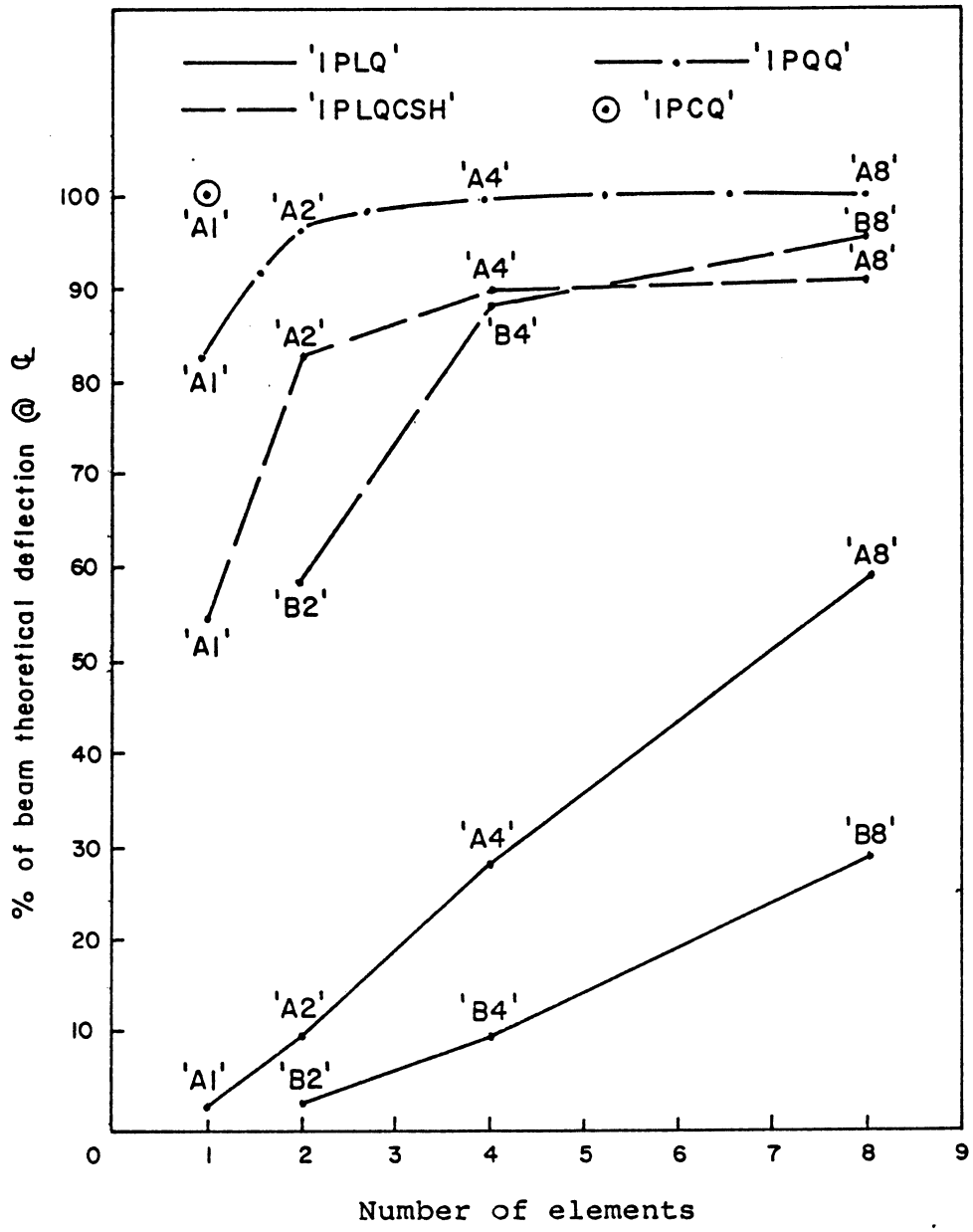


Figure 8.8.4.3: Plot of % of beam theoretical deflection @ center-line vs. number of elements

The following observations can be drawn from the results obtained from the simply supported beam problem.

1) Increasing the number of elements in a solution does not always improve the answer. For example, from grid 'A1' to 'B2' by doubling the number of elements the element aspect ratio is also doubled.

2) The mesh layout that contains elements with high aspect ratio may give grossly inaccurate results.

3) A large number of elements must be used for the flexure (bending) problem when the linear displacement interpolation function element is used in order to achieve an accurate solution.

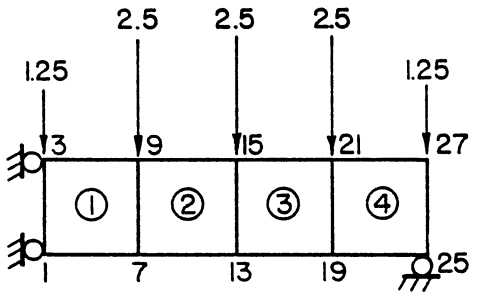
4) The special element, 'IPLQCSH,' which has a linear interpolation function worked very well for the bending problem.

5) The quadratic element, 'IPQQ' provides a very good answer even with very few elements.

6) For the cubic displacement interpolation function element 'IPCQ,' only 1 element is needed to achieve the exact solution.

The following are the listing and outputs of some of the STRUDL runs for the simply supported beam problem, using the 'IPLQ,' 'IPLQCSH,' 'IPQQ' and 'IPCQ' elements for different mesh layouts.

Case 1: For the 'IPLQCSH' element, and mesh 'A4.'



'A4'

PAGE - 2

```
STRUDL 'A4'   'FOUR ELEMENTS'
*****************************************************************
*                                                               *
*   MCAUTO STRUDL                          RELEASE 4.5  APR 1981  *
*   MCAUTO STRUDL DYNAL                    RELEASE 6.5            *
*   MCAUTO STRUDL PLOTS                    RELEASE 3.5            *
*                                                               *
*                                                               *
*                    TIME 17.11.39,  1/29/82                    *
*                                                               *
*                  DATA POOL SIZE   30640 BYTES                 *
*                                                               *
*****************************************************************


UNIT KIP FEET                $ BDEROCBSM2

$ SPECIFY TYPE OF PROBLEM (STRUCTURAL SPECIFICATION)  P 6.1

TYPE PLANE STRESS

$ DISCRETIZATION OF THE GEOMETRY  P  6.86

MESH COORDINATES

   1  TO 25  BY  6   X  0.  INCR  2.5   Y  0.

   3  TO 27  BY  6   X  0.  INCR  2.5   Y  1.

MESH INCIDENCES

   1 TO 4 / 1 TO 19 BY 6 / 7 TO 25 BY 6 / 9 TO 27 BY 6 / 3 TO 21 BY 6

$ DEFINE TYPE OF ELEMENT  P G.2

ELEMENT PROPERTIES

   1 TO 4  TYPE 'IPLQCSH'  THICKNESS  0.5

CONSTANTS

   E  4320000.  ALL

   POISSON  0.3 ALL

   G  1660000.  ALL

$ BOUNDARY  CONDITIONS
```

PAGE - 3

```
SUPPORT JOINTS  1  3  25
   JOINT 1  3  RELEASE FORCE Y
   JOINT 25    RELEASE FORCE X
$ LOADING   P 7.23
LOADING 1  'UNIFORM LOAD'
   JOINT  3  27  LOAD FORCE Y  -1.25
   JOINT 9 15 21 LOAD FORCE Y  -2.5
PRINT STRUCTURAL DATA
```

PAGE - 4

```
****************************************
*  PROBLEM DATA FROM INTERNAL STORAGE  *
****************************************

JOB ID -  A4          JOB TITLE - FOUR ELEMENTS

ACTIVE UNITS -  LENGTH        FORCE       ANGLE       TEMPERATURE     TIME        MASS
                  FEET         KIPS         RAD           FAHR          SEC         LBM


        ********** STRUCTURAL DATA **********


JOINT COORDINATE REFERENCE SYSTEMS ----------------------------------------/
ID.    ORIGIN  X          Y          Z   ROTAT. R1         R2         R3


JOINT COORDINATES----------------------------------------/  STATUS---/
JOINT            X           Y           Z     CONDITION

1               0.0         0.0         0.0     SUPPORT    ACTIVE       GLOBAL
7               2.500       0.0         0.0                ACTIVE       GLOBAL
13              5.000       0.0         0.0                ACTIVE       GLOBAL
19              7.500       0.0         0.0                ACTIVE       GLOBAL
25             10.000       0.0         0.0     SUPPORT    ACTIVE       GLOBAL
3               0.0         1.000       0.0     SUPPORT    ACTIVE       GLOBAL
9               2.500       1.000       0.0                ACTIVE       GLOBAL
15              5.000       1.000       0.0                ACTIVE       GLOBAL
21              7.500       1.000       0.0                ACTIVE       GLOBAL
27             10.000       1.000       0.0                ACTIVE       GLOBAL


JOINT RELEASES-----------------------------------/ELASTIC SUPPORT RELEASES-----------------------------------------------/
JOINT   FORCE  MOMENT   THETA 1  THETA 2  THETA 3     KFX         KFY         KFZ         KMX         KMY         KMZ
1         Y              0.0      0.0      0.0        0.0         0.0         0.0         0.0         0.0         0.0
25      X                0.0      0.0      0.0        0.0         0.0         0.0         0.0         0.0         0.0
3         Y              0.0      0.0      0.0        0.0         0.0         0.0         0.0         0.0         0.0


ELEMENT INCIDENCES-----------------------------------------------------------------------/--STATUS--/-----/----TYPE----/
ELEMENT              NODES

1          1         7         9         3                                                ACTIVE        IPLQCSH
2
```

```
                                                                                                                  PAGE -        5

            7         13        15        9                                                  ACTIVE          IPLQCSH
3           13        19        21        15                                                 ACTIVE          IPLQCSH
4           19        25        27        21                                                 ACTIVE          IPLQCSH


ELEMENT PROPERTIES-----------------------------------------------------------------------------------------------------/
ELEMENT    TYPE  THICKNESS   /--------CURVATURES--------/ /--------------THERMAL EXPANSION COEFFICIENTS---------------/
                               K1        K2        K12       CAX       CAY       CAZ       CSXY      CSXZ      CSYZ


1        IPLQCSH    0.500
2        IPLQCSH    0.500
3        IPLQCSH    0.500
4        IPLQCSH    0.500

MEMBER CONSTANTS-------------------------------------------------------------------------------------------------------/
CONSTANT   STANDARD VALUE   DOMAIN          VALUE       MEMBER LIST


   E         0.432000E+07    ALL

   G         0.166000E+07    ALL

DENSITY      0.172800E+04    ALL

  CTE        0.100000E+01    ALL

  BETA       0.0             ALL

POISSON      0.300000E+00    ALL



****************************************
*  END OF DATA FROM  INTERNAL STORAGE  *
****************************************


$ EXECUTE

STIFFNESS ANALYSIS REDUCE BAND


LIST DISPLACEMENT STRESSES REACTIONS ALL
```

PAGE - 10

```
****************************
*RESULTS OF LATEST ANALYSES*
****************************
```

PROBLEM - A4 TITLE - FOUR ELEMENTS

ACTIVE UNITS FEET KIPS RAD FAHR SEC LBM

LOADING - 1 UNIFORM LOAD

/-ELEMENT-//							
1	NODE	1	SXX	0.581197E+03	SYY	0.173254E+03	SXY 0.511062E+03
		7	SXX	0.581301E+03	SYY	0.173602E+03	SXY -0.506124E+03
		9	SXX	-0.581198E+03	SYY	-0.175148E+03	SXY -0.506063E+03
		3	SXX	-0.581303E+03	SYY	-0.175496E+03	SXY 0.511118E+03
2	NODE	7	SXX	0.506417E+03	SYY	0.151137E+03	SXY 0.450548E+03
		13	SXX	0.506079E+03	SYY	0.150011E+03	SXY -0.435387E+03
		15	SXX	-0.506419E+03	SYY	-0.153739E+03	SXY -0.435541E+03
		9	SXX	-0.506082E+03	SYY	-0.152613E+03	SXY 0.450391E+03
3	NODE	13	SXX	0.355578E+03	SYY	0.104860E+03	SXY 0.323904E+03
		19	SXX	0.356913E+03	SYY	0.109309E+03	SXY -0.299533E+03
		21	SXX	-0.355586E+03	SYY	-0.104440E+03	SXY -0.298908E+03
		15	SXX	-0.356921E+03	SYY	-0.108889E+03	SXY 0.324528E+03
4	NODE	19	SXX	0.133960E+03	SYY	0.424236E+02	SXY 0.133611E+03
		25	SXX	0.128536E+03	SYY	0.243422E+02	SXY -0.960764E+02
		27	SXX	-0.133964E+03	SYY	-0.544077E+02	SXY -0.986096E+02
		21	SXX	-0.128539E+03	SYY	-0.363262E+02	SXY 0.131078E+03

PAGE - 11

LOADING - 1 UNIFORM LOAD

SUPPORT JOINT REACTION LOADS LOADING - 1

JOINT		FORCE			MOMENT		
		X FORCE	Y FORCE	Z FORCE	X MOMENT	Y MOMENT	Z MOMENT
1	GLOBAL	-49.9999847	-0.0000000				
25	GLOBAL	0.0000000	9.9999990				
3	GLOBAL	49.9999847	0.0				

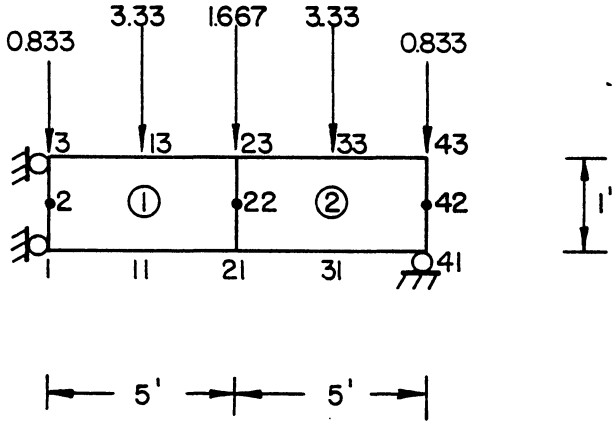
RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - 1

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
1	GLOBAL	0.0	-0.0103308				
25	GLOBAL	0.0008308	0.0				
3	GLOBAL	0.0	-0.0103311				

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
7	GLOBAL	0.0003063	-0.0095618				
13	GLOBAL	0.0005731	-0.0073534				
19	GLOBAL	0.0007607	-0.0040026				
9	GLOBAL	-0.0003059	-0.0095620				
15	GLOBAL	-0.0005723	-0.0073538				
21	GLOBAL	-0.0007600	-0.0040021				
27	GLOBAL	-0.0008280	-0.0000033				

Case 2: Using 'IPQQ' element and mesh 'A2.'



PAGE - 2

```
STRUDL 'A2'   'TWO ELEMENTS'
*****************************************************************
*                                                               *
*   MCAUTO STRUDL                          RELEASE 4.5  APR 1981  *
*   MCAUTO STRUDL DYNAL                    RELEASE 6.5            *
*   MCAUTO STRUDL PLOTS                    RELEASE 3.5            *
*                                                               *
*                                                               *
*                    TIME 17.18.18,  1/29/82                    *
*                                                               *
*                  DATA POOL SIZE   30640 BYTES                 *
*                                                               *
*****************************************************************


UNIT KIP FEET                $ BDEROCBSM3

$ SPECIFY TYPE OF PROBLEM (STRUCTURAL SPECIFICATION)  P 6.1

TYPE PLANE STRESS

$ DISCRETIZATION OF THE GEOMETRY  P  6.86

MESH COORDINATES

   1  TO 41 BY  10   X  0.  INCR  2.5   Y  0.

   2  TO 42 BY  20   X  0.  INCR  5.0   Y  0.5

   3  TO 43 BY  10   X  0.  INCR  2.5   Y  1.

ELEMENT INCIDENCES

   1   1 21 23  3 11 22 13  2

   2  21 41 43 23 31 42 33 22

$ DEFINE TYPE OF ELEMENT  P G.2

ELEMENT PROPERTIES

   1    2  TYPE 'IPQQ'     THICKNESS  0.5

CONSTANTS

   E  4320000.  ALL

   POISSON  0.3 ALL
```

```
   G  1660000.  ALL
$ BOUNDARY  CONDITIONS
SUPPORT JOINTS  1  2  3  41
   JOINT 1 2 3 RELEASE FORCE Y
   JOINT 41    RELEASE FORCE X
$ LOADING   P 7.23
LOADING 1  'UNIFORM LOAD'
   JOINT  3  43  LOAD FORCE Y  -0.833
   JOINT 13  33  LOAD FORCE Y  -3.333
   JOINT 23      LOAD FORCE Y  -1.667
PRINT STRUCTURAL DATA
```

```
****************************************
*  PROBLEM DATA FROM INTERNAL STORAGE  *
****************************************

JOB ID -  A2          JOB TITLE - TWO ELEMENTS

ACTIVE UNITS -  LENGTH        FORCE       ANGLE       TEMPERATURE      TIME        MASS
                  FEET         KIPS         RAD           FAHR          SEC         LBM


         ********** STRUCTURAL DATA **********


JOINT COORDINATE REFERENCE SYSTEMS ----------------------------------------------/
ID.    ORIGIN  X          Y          Z   ROTAT. R1          R2          R3


JOINT COORDINATES----------------------------------------/  STATUS---/
JOINT            X           Y           Z     CONDITION

1               0.0         0.0         0.0     SUPPORT    ACTIVE       GLOBAL
11              2.500       0.0         0.0                ACTIVE       GLOBAL
21              5.000       0.0         0.0                ACTIVE       GLOBAL
31              7.500       0.0         0.0                ACTIVE       GLOBAL
41             10.000       0.0         0.0     SUPPORT    ACTIVE       GLOBAL
2               0.0         0.500       0.0     SUPPORT    ACTIVE       GLOBAL
22              5.000       0.500       0.0                ACTIVE       GLOBAL
42             10.000       0.500       0.0                ACTIVE       GLOBAL
3               0.0         1.000       0.0     SUPPORT    ACTIVE       GLOBAL
13              2.500       1.000       0.0                ACTIVE       GLOBAL
23              5.000       1.000       0.0                ACTIVE       GLOBAL
33              7.500       1.000       0.0                ACTIVE       GLOBAL
43             10.000       1.000       0.0                ACTIVE       GLOBAL


JOINT RELEASES-----------------------------------/ELASTIC SUPPORT RELEASES-----------------------------------------------/
JOINT   FORCE  MOMENT   THETA 1  THETA 2  THETA 3     KFX         KFY         KFZ         KMX         KMY         KMZ
1         Y              0.0      0.0      0.0        0.0         0.0         0.0         0.0         0.0         0.0
41      X                0.0      0.0      0.0        0.0         0.0         0.0         0.0         0.0         0.0
2         Y              0.0      0.0      0.0        0.0         0.0         0.0         0.0         0.0         0.0
3         Y              0.0      0.0      0.0        0.0         0.0         0.0         0.0         0.0         0.0


ELEMENT INCIDENCES-------------------------------------------------------------------------/--STATUS--/-----/----TYPE----/
```

```
ELEMENT                NODES

1          1        21       23       3        11       22       13       2        ACTIVE          IPQQ
2          21       41       43       23       31       42       33       22       ACTIVE          IPQQ


ELEMENT PROPERTIES-------------------------------------------------------------------------------------------------/
ELEMENT    TYPE  THICKNESS   /--------CURVATURES--------/ /--------------THERMAL EXPANSION COEFFICIENTS---------------/
                              K1       K2       K12      CAX      CAY      CAZ      CSXY     CSXZ     CSYZ


1        IPQQ       0.500
2        IPQQ       0.500

MEMBER CONSTANTS---------------------------------------------------------------------------------------------------/
CONSTANT   STANDARD VALUE   DOMAIN          VALUE       MEMBER LIST


   E         0.432000E+07    ALL

   G         0.166000E+07    ALL

DENSITY      0.172800E+04    ALL

  CTE        0.100000E+01    ALL

  BETA       0.0             ALL

POISSON      0.300000E+00    ALL


****************************************
*  END OF DATA FROM  INTERNAL STORAGE  *
****************************************


$ EXECUTE

STIFFNESS ANALYSIS REDUCE BAND


LIST DISPLACEMENT STRESSES REACTIONS ALL
```

PAGE - 10

```
****************************
*RESULTS OF LATEST ANALYSES*
****************************


 PROBLEM - A2        TITLE - TWO ELEMENTS

 ACTIVE UNITS  FEET KIPS RAD  FAHR SEC  LBM


 LOADING - 1            UNIFORM LOAD

/-ELEMENT-//-------------------------------------------------------------------------------------------------------------/

 1        NODE   1          SXX  0.570299E+03   SYY -0.172279E+02   SXY  0.170576E+02
                 21         SXX  0.528729E+03   SYY  0.304201E+02   SXY  0.279980E+02
                 23         SXX -0.529590E+03   SYY -0.373410E+02   SXY  0.265621E+02
                 3          SXX -0.571155E+03   SYY  0.136719E+02   SXY  0.174838E+02
                 11         SXX  0.550095E+03   SYY  0.853260E+01   SXY -0.457577E+01
                 22         SXX -0.377425E+00   SYY -0.344453E+01   SXY  0.284765E+02
                 13         SXX -0.549768E+03   SYY -0.981858E+01   SXY -0.507713E+01
                 2          SXX -0.381104E+00   SYY -0.178266E+01   SXY  0.184581E+02

 2        NODE   21         SXX  0.320993E+03   SYY -0.319006E+02   SXY  0.586830E+02
                 41         SXX  0.174407E+03   SYY -0.850426E+01   SXY  0.699573E+02
                 43         SXX -0.178968E+03   SYY -0.272474E+02   SXY  0.690916E+02
                 23         SXX -0.325552E+03   SYY  0.238706E+02   SXY  0.603576E+02
                 31         SXX  0.251429E+03   SYY -0.777326E+01   SXY -0.115289E+02
                 42         SXX -0.259745E+01   SYY -0.179709E+02   SXY  0.710854E+02
                 33         SXX -0.248513E+03   SYY  0.108047E+02   SXY -0.111230E+02
                 22         SXX -0.259661E+01   SYY -0.411028E+01   SXY  0.610818E+02
```

LOADING - 1 UNIFORM LOAD

SUPPORT JOINT REACTION LOADS LOADING - 1

JOINT		FORCE X FORCE	FORCE Y FORCE	FORCE Z FORCE	MOMENT X MOMENT	MOMENT Y MOMENT	MOMENT Z MOMENT
1	GLOBAL	-50.0737610	0.0000000				
41	GLOBAL	-0.0000000	9.9989948				
2	GLOBAL	0.1575760	-0.0000000				
3	GLOBAL	49.9161835	0.0000002				

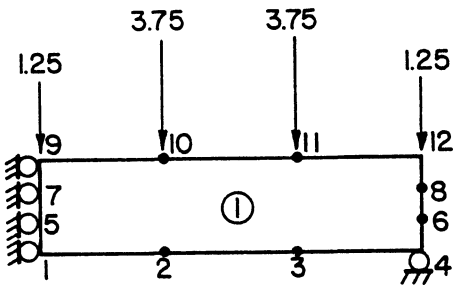
RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
1	GLOBAL	0.0	-0.0112254				
41	GLOBAL	0.0009274	0.0				
2	GLOBAL	0.0	-0.0112363				
3	GLOBAL	0.0	-0.0112257				

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
11	GLOBAL	0.0003249	-0.0104041				
21	GLOBAL	0.0006337	-0.0079916				
31	GLOBAL	0.0008028	-0.0043665				
22	GLOBAL	0.0000005	-0.0079992				
42	GLOBAL	0.0000013	-0.0000045				
13	GLOBAL	-0.0003247	-0.0104042				
23	GLOBAL	-0.0006329	-0.0079924				
33	GLOBAL	-0.0008020	-0.0043663				
43	GLOBAL	-0.0009243	-0.0000040				

Case 3: For the 'IPCQ' element and mesh 'A1'



```
STRUDL 'A1'   'ONE ELEMENT'
*****************************************************************
*                                                               *
*   MCAUTO STRUDL                          RELEASE 4.5  APR 1981  *
*   MCAUTO STRUDL DYNAL                    RELEASE 6.5            *
*   MCAUTO STRUDL PLOTS                    RELEASE 3.5            *
*                                                               *
*                                                               *
*                    TIME 17.19.58,  1/29/82                    *
*                                                               *
*                  DATA POOL SIZE   30640 BYTES                 *
*                                                               *
*****************************************************************


UNIT KIP FEET                $ BDEROCBSM4

$ USING CUBIC DISPLACEMENT ELEMENT

TYPE PLANE STRESS

$ DISCRETIZATION OF THE GEOMETRY  P  6.86

MESH COORDINATES

   1  TO 4   X  0.  INCR  3.3333   Y  0.

   5 6       X  0.  INCR 10.0      Y  0.3333

   7 8       X  0.  INCR 10.0      Y  0.6667

 9 TO 12     X  0.  INCR  3.3333   Y  1.0

ELEMENT INCIDENCES

   1   1  4 12  9  2  3  6  8 11 10  7  5

$ DEFINE TYPE OF ELEMENT  P G.2

ELEMENT PROPERTIES

   1   TYPE 'IPCQ'     THICKNESS  0.5

CONSTANTS

   E  4320000.  ALL

   POISSON  0.3 ALL
```

```
   G  1660000.  ALL
$ BOUNDARY  CONDITIONS
SUPPORT JOINTS  1  5  7  9  4
   JOINT 1 5 7 9 RELEASE FORCE Y
   JOINT 4       RELEASE FORCE X
$ LOADING   P 7.23
LOADING 1  'UNIFORM LOAD'
   JOINT  9  12  LOAD FORCE Y  -1.25
   JOINT 10  11  LOAD FORCE Y  -3.75
PRINT STRUCTURAL DATA
```

```
****************************************
*  PROBLEM DATA FROM INTERNAL STORAGE  *
****************************************

JOB ID -  A1          JOB TITLE - ONE ELEMENT

ACTIVE UNITS -  LENGTH        FORCE       ANGLE       TEMPERATURE     TIME        MASS
                  FEET         KIPS         RAD           FAHR          SEC         LBM


         ********** STRUCTURAL DATA **********
```

JOINT COORDINATE REFERENCE SYSTEMS ----------/

ID.	ORIGIN	X	Y	Z	ROTAT.	R1	R2	R3

JOINT COORDINATES----------/ STATUS---/

JOINT	X	Y	Z	CONDITION		
1	0.0	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
2	3.333	0.0	0.0		ACTIVE	GLOBAL
3	6.667	0.0	0.0		ACTIVE	GLOBAL
4	10.000	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
5	0.0	0.333	0.0	SUPPORT	ACTIVE	GLOBAL
6	10.000	0.333	0.0		ACTIVE	GLOBAL
7	0.0	0.667	0.0	SUPPORT	ACTIVE	GLOBAL
8	10.000	0.667	0.0		ACTIVE	GLOBAL
9	0.0	1.000	0.0	SUPPORT	ACTIVE	GLOBAL
10	3.333	1.000	0.0		ACTIVE	GLOBAL
11	6.667	1.000	0.0		ACTIVE	GLOBAL
12	10.000	1.000	0.0		ACTIVE	GLOBAL

JOINT RELEASES----------/ELASTIC SUPPORT RELEASES----------/

JOINT	FORCE	MOMENT	THETA 1	THETA 2	THETA 3	KFX	KFY	KFZ	KMX	KMY	KMZ
1	Y		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	X		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Y		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Y		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Y		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ELEMENT INCIDENCES----------/--STATUS--/-----/----TYPE----/

```
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
PAGE -  5

ELEMENT  NODES

1  1  4  12  9  2  3  6  8  ACTIVE  IPCQ
   11  10  7  5


ELEMENT PROPERTIES----------------------------------------------------------------------------------------------------------/
ELEMENT  TYPE  THICKNESS  /--------CURVATURES--------/ /--------------THERMAL EXPANSION COEFFICIENTS---------------/
                           K1  K2  K12  CAX  CAY  CAZ  CSXY  CSXZ  CSYZ


1  IPCQ  0.500

MEMBER CONSTANTS------------------------------------------------------------------------------------------------------------/
CONSTANT  STANDARD VALUE  DOMAIN  VALUE  MEMBER LIST


E  0.432000E+07  ALL

G  0.166000E+07  ALL

DENSITY  0.172800E+04  ALL

CTE  0.100000E+01  ALL

BETA  0.0  ALL

POISSON  0.300000E+00  ALL


****************************************
*  END OF DATA FROM  INTERNAL STORAGE  *
****************************************

$ EXECUTE

STIFFNESS ANALYSIS REDUCE BAND


LIST DISPLACEMENT STRESSES REACTIONS ALL
```

PAGE - 10

```
****************************
*RESULTS OF LATEST ANALYSES*
****************************


 PROBLEM - A1        TITLE - ONE ELEMENT

 ACTIVE UNITS  FEET KIPS RAD  FAHR SEC  LBM


 LOADING - 1            UNIFORM LOAD

/-ELEMENT-//-------------------------------------------------------------------------------------------------------------/

 1        NODE   1          SXX  0.677383E+03   SYY -0.174976E+01   SXY -0.176559E+02
                 4          SXX  0.734367E+02   SYY -0.279786E+02   SXY  0.196261E+02
                 12         SXX -0.774097E+02   SYY -0.545339E+01   SXY  0.170331E+02
                 9          SXX -0.673269E+03   SYY  0.729629E+01   SXY -0.195838E+02
                 2          SXX  0.508058E+03   SYY  0.178850E+01   SXY  0.590607E+01
                 3          SXX  0.309682E+03   SYY  0.284193E+01   SXY -0.757464E+01
                 6          SXX  0.227565E+02   SYY -0.205690E+02   SXY  0.442873E+02
                 8          SXX -0.268212E+02   SYY -0.128616E+02   SXY  0.434253E+02
                 11         SXX -0.307944E+03   SYY  0.274570E-01   SXY -0.678352E+01
                 10         SXX -0.509630E+03   SYY -0.594439E+01   SXY  0.691590E+01
                 7          SXX -0.222767E+03   SYY  0.430924E+01   SXY -0.174261E+02
                 5          SXX  0.226773E+03   SYY  0.119296E+01   SXY -0.167865E+02
```

LOADING - 1 UNIFORM LOAD

SUPPORT JOINT REACTION LOADS LOADING - 1

JOINT		FORCE X FORCE	FORCE Y FORCE	FORCE Z FORCE	MOMENT X MOMENT	MOMENT Y MOMENT	MOMENT Z MOMENT
1	GLOBAL	-26.5627136	0.0000000				
4	GLOBAL	0.0000000	9.9999952				
5	GLOBAL	-69.8836060	0.0000000				
7	GLOBAL	69.4709930	-0.0000000				
9	GLOBAL	26.9753876	0.0				

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
1	GLOBAL	0.0	-0.0116320				
4	GLOBAL	0.0009285	0.0				
5	GLOBAL	0.0	-0.0116425				
7	GLOBAL	0.0	-0.0116423				
9	GLOBAL	0.0	-0.0116315				

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
2	GLOBAL	0.0004592	-0.0100225				
3	GLOBAL	0.0007759	-0.0058045				
6	GLOBAL	0.0003096	-0.0000028				
8	GLOBAL	-0.0003069	-0.0000040				
10	GLOBAL	-0.0004586	-0.0100229				
11	GLOBAL	-0.0007754	-0.0058042				
12	GLOBAL	-0.0009255	-0.0000037				

8.9 PLATE BENDING ELEMENT

The plate bending element is used to model the bending effects of an elastic thin plate due to a load applied normal to the plane of the plate. (Figure 8.9.1)

The basic assumptions used for the development of the thin plate theory are:

- small deformation problem
- linear elastic material
- neglect transverse shear deformation, i.e., plane remains plane after deformation.

Hence, the accuracy of this model to represent an actual physical problem will depend on the validity of the assumptions made. The reader who is interested in the theoretical foundation of the plate bending theory might refer to "Theory of Plate and Shell" by Timoshenko.

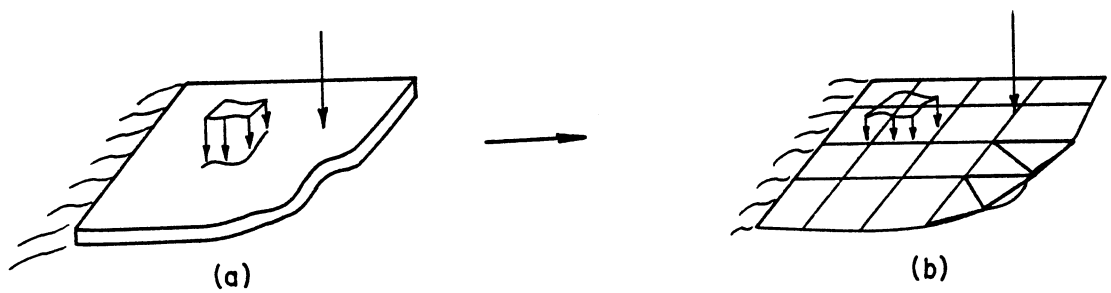
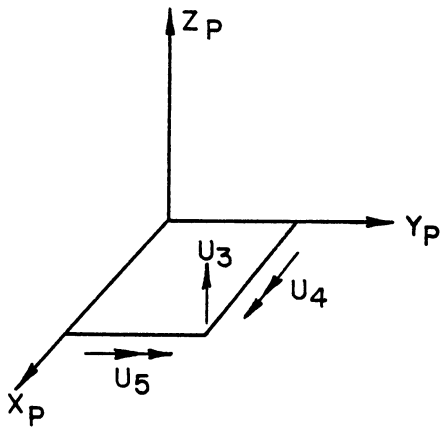


Figure 8.9.1

a) A plate bending problem, where loads are applied normal to the plane of the plate, b) a finite element idealization.

Many plate bending elements are available in the STRUDL library. These are the 'CPT' which is a triangular element, the 'BPR' a rectangular element, the 'BPP' a parallelogram element useful for skew plate and the 'PBQ1' which is a quadrilateral element formed by overlaying four 'CPT' triangular elements.

Each node of above elements contains three degrees of freedom, two inplane rotations (U_4 and $U5$) and the displacement normal to the plane (U_3).



U_3 = displacement normal to the plane of the plate

U_4 and $U5$ = rotations in the two major axis that define the plane of the plate.

8.9.1 Convention for Output Results (Page G.24 to G.25)

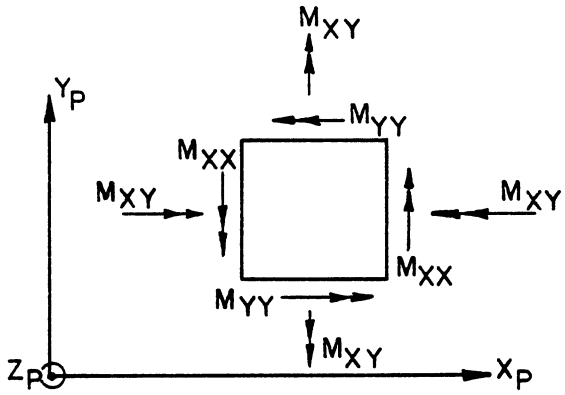
The plate bending element provides the following output at the element middle surface with reference to the element planar coordinates system:

$\left.\begin{matrix} M_{xx} \\ M_{yy} \end{matrix}\right\}$ Bending moment per unit length

M_{xy} Twisting moment per unit length

$\left.\begin{matrix} V_x \\ V_y \end{matrix}\right\}$ Transverse shear force per unit length

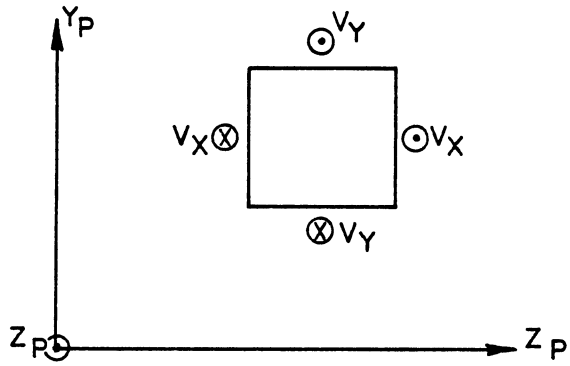
Positive Moment Sign Convention



Positive Transverse Shear Force Sign Convention

⊙ Up, out of the plane of the paper

⊗ Down, going in the plane of the paper

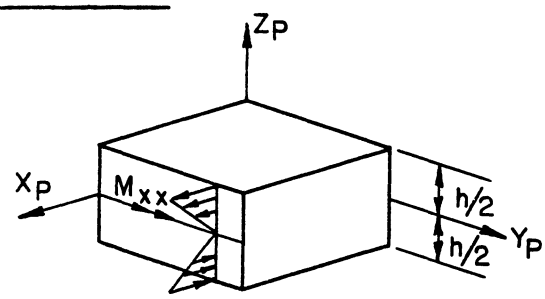


Positive bending moments produce tension on the upper surface; positive shears are up on the positive faces, and positive torsional moments produces forces at the upper surface in the direction of the positive planar axis.

8.9.2 Obtaining Stresses from Moment and Shear

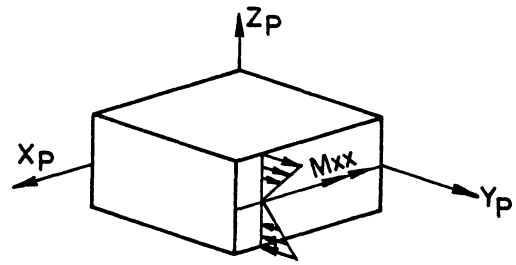
$$\sigma_x = \frac{12\ M_{xx}\ Z_p}{h^3}$$

$$\sigma_{x_{max}} = \pm \frac{6\ M_{xx}}{h^2}$$



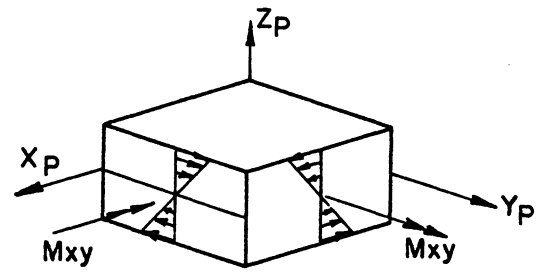
$$\sigma_y = \frac{12\ M_{yy}\ Z_p}{h^3}$$

$$\sigma_{y_{max}} = \pm \frac{6\ M_{yy}}{h^2}$$



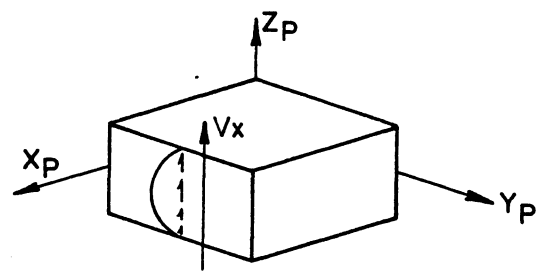
$$\tau_{xy} = \frac{12\ M_{xy}\ Z_p}{h^3}$$

$$\tau_{xy_{max}} = \pm \frac{6\ M_{xy}}{h^2}$$



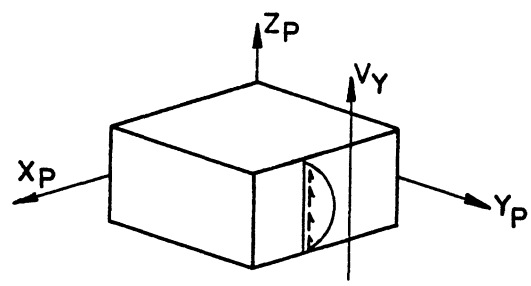
$$\tau_{xz} = \frac{3}{2h} V_x \left[1 - \left(\frac{2Z_p}{h}\right)^2\right]$$

$$\tau_{xz_{max}} = \pm \frac{3\ V_x}{2h}$$



$$\tau_{yz} = \frac{3}{2h} V_y \left[1 - \left(\frac{2Z_p}{h}\right)^2\right]$$

$$\tau_{yz_{max}} = \pm \frac{3\ V_y}{2h}$$



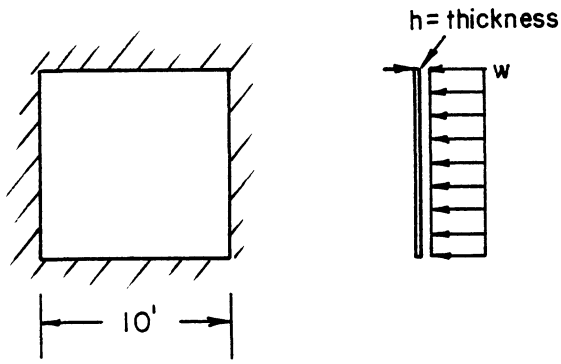
Note: $-h/2 \leq Z_p \leq h/2$

and h = thickness of the plate

8.9.3 Effect of Element Asymmetry

As discussed in Section 8.5, the triangular element possesses a unique problem of asymmetry. This will be illustrated with a simple plate bending problem.

Let's consider a square clamped plate under uniform load w.



$$\begin{cases} w = 0.15\ k/ft^2 \\ h = 0.1j' \\ E = 432000\ \ KSF \\ N = 0.3 \end{cases}$$

The 'CPT' triangular element is used, and the following discretization patterns 'T1' and 'T2' are used to illustrate the asymmetry effect. In order to demonstrate that a rectangular element does not possess the asymmetry problem, a run with the 'BPR' element and discretization pattern 'T3' is also presented.

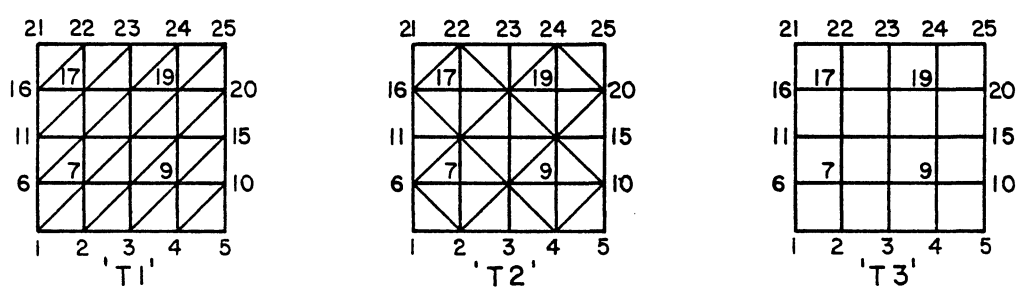


Figure 8.9.3.1

The steps presented in Section 8.7 are used to code the pattern 'T1.'

Steps

1) Select Mathematical Model and Initialize

The type of mathematical model that best describes this plate with load applied normal to the plane of the plate is the plate bending theory. The following STRUDL commands initialize and define the type of problem.

```
STRUDL 'T1' '32 Elements'
UNIT FEET KIPS
TYPE PLATE BENDING
```

2) Discretize the geometry and select element

The discretization pattern 'T1' shown in Figure 8.9.3.1 and element type 'CPT' are used. The following STRUDL commands were used.

```
MESH COORDINATES
 1 TO  5  X  0.  INCR  2.5  Y  0.
 6 TO 10  X  0.  INCR  2.5  Y  2.5
11 TO 15  X  0.  INCR  2.5  Y  5.
16 TO 20  X  0.  INCR  2.5  Y  7.5
21 TO 25  X  0.  INCR  2.5  Y  10.
```

```
MESH INCIDENCES
 1 TO  4  /  1 TO  4  /  2  TO  5  /  7  TO  10
 5 TO  8  /  6 TO  9  /  1  TO  4  /  7  TO  10
 9 TO 12  /  6 TO  9  /  7  TO 10  / 12  TO  15
13 TO 16  /  6 TO  9  / 12  TO 15  / 11  TO  14
17 TO 20  / 11 TO 14  / 12  TO 15  / 17  TO  20
21 TO 24  / 11 TO 14  / 17  TO 20  / 16  TO  19
25 TO 28  / 16 TO 19  / 17  TO 20  / 22  TO  25
29 TO 32  / 16 TO 19  / 22  TO 25  / 21  TO  24
```

```
ELEMENT PROPERTIES
1 to 32 TYPE 'CPT' THICKNESS 0.1
CONSTANTS
E 4320000. ALL
POISSON 0.3 ALL
G 1660000. ALL
```

3) Boundary Conditions: The fixed boundary all around the plate is defined by the support joint command.

SUPPORT JOINTS 1 to 5 21 to 25 6 11 16 10 15 20

4) Define Loading: For the plate bending elements, the loading definition, joint loads and joint displacements are the same as for the previous chapter. For the surface element load a STRUDL command is available. Unlike the plane stress element where an equivalent nodal point load has to be computed.

The command syntax is as follows: (See STRUDL user manual section 7.1.4.2 for details.)

```
ELEMENT LOADS (type specs) (load specs)
list
  |
  |
  |
```

OR

ELEMENT list LOADS (type specs) (load specs)

type specs = SURFACE (FORCE) { → LOCAL / GLOBAL / PROJECTED }

load specs = [PX] V_1 [PY] V_2 [PZ] V_3

V_1 to V_3 = values of the loads components

For the present problem, the following STRUDL commands are used to define the loading.

```
[LOADING 'ONE' 'UNIFORM'
 ELEMENT LOAD
 1 TO 32 SURFACE FORCE GLOBAL PZ -0.15]
```

5) Check input: The input data is checked with print and plot.

6) Assemble and Solve: Once the input data is checked, the problem can be solved using the [STIFFNESS ANALYSIS] command.

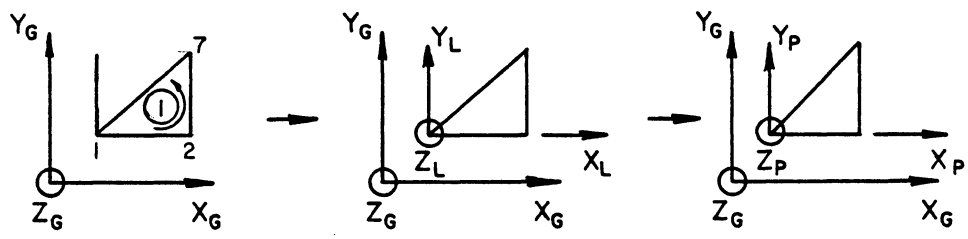
7) Print output and interpretation of results: The results of moments, shear, displacements and reactions of the problem can be listed with the following STRUDL command.

[LIST STRESS DISPLACEMENT REACTION ALL]

Again, the results of stress (moment and shear) are in terms of planar coordinates. For this case, since all element incidences of the problem were counterclockwise, therefore, the local or planar z coordinates coincide with the global z. Hence, planar x and y coincide with the global x and y respectively.

Element 1

Incidence is 1 2 7



The following are the inputs and outputs of the square plate for patterns 'T1,' 'T2' and 'T3.'

```
STRUDL 'T1'   '32  ELEMENTS'
*****************************************************************
*                                                               *
*   MCAUTO STRUDL                          RELEASE 4.5  APR 1981  *
*   MCAUTO STRUDL DYNAL                    RELEASE 6.5            *
*   MCAUTO STRUDL PLOTS                    RELEASE 3.5            *
*                                                               *
*                                                               *
*                    TIME 17.29.54,  2/02/82                    *
*                                                               *
*                  DATA POOL SIZE   30640 BYTES                 *
*                                                               *
*****************************************************************


UNIT KIP FEET                $ BDEROCBSM5

$ EXAMPLE #1, SQUARE CLAMPED PLATE, USING TRIANGULAR ELEMENTS  'CPT'

$     AND RECTANGULAR ELEMENT  'BPR'

$

$ THE OBJECT IS TO SHOW THE ASYMMETRY EFFECT THAT MIGHT BE PRODUCED

$     BY THE TRIANGULAR ELEMENTS

$

$ A TOTAL OF 3 PATTERNS ARE STUDIED

$

$ PATTERN T1 WITH 32 TRIANGULAR ELEMENTS

$

TYPE PLATE BENDING

MESH COORDINATES

  1  TO  5  X  0.  INCR  2.5  Y   0.

  6  TO 10  X  0.  INCR  2.5  Y   2.5

 11  TO 15  X  0.  INCR  2.5  Y   5.

 16  TO 20  X  0.  INCR  2.5  Y   7.5
```

```
 21  TO 25  X  0.  INCR  2.5  Y  10.
MESH INCIDENCES
  1  TO  4  /  1  TO  4  /  2  TO  5  /  7  TO  10
  5  TO  8  /  6  TO  9  /  1  TO  4  /  7  TO  10
  9  TO 12  /  6  TO  9  /  7  TO 10  / 12  TO  15
 13  TO 16  /  6  TO  9  / 12  TO 15  / 11  TO  14
 17  TO 20  / 11  TO 14  / 12  TO 15  / 17  TO  20
 21  TO 24  / 11  TO 14  / 17  TO 20  / 16  TO  19
 25  TO 28  / 16  TO 19  / 17  TO 20  / 22  TO  25
 29  TO 32  / 16  TO 19  / 22  TO 25  / 21  TO  24
ELEMENT PROPERTIES
  1 TO 32  TYPE  'CPT'  THICKNESS 0.1
CONSTANTS
  E 4320000.    ALL
  POISSON  0.3  ALL
  G 1660000.    ALL
SUPPORT JOINTS  1  TO  5   21  TO  25  6  11  16  10  15  20
LOADING 1 'UNIFORM'
ELEMENT LOAD
  1  TO 32  SURFACE FORCE GLOBAL  PZ  -0.15
PRINT STRUCTURAL  DATA
```

```
****************************************
*  PROBLEM DATA FROM INTERNAL STORAGE  *
****************************************

JOB ID -  T1          JOB TITLE - 32  ELEMENTS

ACTIVE UNITS -  LENGTH        FORCE       ANGLE      TEMPERATURE      TIME        MASS
                  FEET         KIPS         RAD          FAHR          SEC         LBM


         ********** STRUCTURAL DATA **********


JOINT COORDINATE REFERENCE SYSTEMS ----------------------------------------/
ID.    ORIGIN  X          Y          Z   ROTAT. R1         R2         R3


JOINT COORDINATES-----------------------------------------/  STATUS---/
JOINT            X           Y           Z     CONDITION
```

JOINT	X	Y	Z	CONDITION	STATUS	
1	0.0	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
2	2.500	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
3	5.000	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
4	7.500	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
5	10.000	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
6	0.0	2.500	0.0	SUPPORT	ACTIVE	GLOBAL
7	2.500	2.500	0.0		ACTIVE	GLOBAL
8	5.000	2.500	0.0		ACTIVE	GLOBAL
9	7.500	2.500	0.0		ACTIVE	GLOBAL
10	10.000	2.500	0.0	SUPPORT	ACTIVE	GLOBAL
11	0.0	5.000	0.0	SUPPORT	ACTIVE	GLOBAL
12	2.500	5.000	0.0		ACTIVE	GLOBAL
13	5.000	5.000	0.0		ACTIVE	GLOBAL
14	7.500	5.000	0.0		ACTIVE	GLOBAL
15	10.000	5.000	0.0	SUPPORT	ACTIVE	GLOBAL
16	0.0	7.500	0.0	SUPPORT	ACTIVE	GLOBAL
17	2.500	7.500	0.0		ACTIVE	GLOBAL
18	5.000	7.500	0.0		ACTIVE	GLOBAL
19	7.500	7.500	0.0		ACTIVE	GLOBAL
20	10.000	7.500	0.0	SUPPORT	ACTIVE	GLOBAL
21	0.0	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
22	2.500	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
23	5.000	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
24	7.500	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
25	10.000	10.000	0.0	SUPPORT	ACTIVE	GLOBAL

PAGE - 5

JOINT RELEASES----------/ELASTIC SUPPORT RELEASES----------/

JOINT	FORCE	MOMENT	THETA 1	THETA 2	THETA 3	KFX	KFY	KFZ	KMX	KMY	KMZ

ELEMENT INCIDENCES----------/--STATUS--/-----/----TYPE----/

ELEMENT	NODES				
1	1	2	7	ACTIVE	CPT
2	2	3	8	ACTIVE	CPT
3	3	4	9	ACTIVE	CPT
4	4	5	10	ACTIVE	CPT
5	6	1	7	ACTIVE	CPT
6	7	2	8	ACTIVE	CPT
7	8	3	9	ACTIVE	CPT
8	9	4	10	ACTIVE	CPT
9	6	7	12	ACTIVE	CPT
10	7	8	13	ACTIVE	CPT
11	8	9	14	ACTIVE	CPT
12	9	10	15	ACTIVE	CPT
13	6	12	11	ACTIVE	CPT
14	7	13	12	ACTIVE	CPT
15	8	14	13	ACTIVE	CPT
16	9	15	14	ACTIVE	CPT
17	11	12	17	ACTIVE	CPT
18	12	13	18	ACTIVE	CPT
19	13	14	19	ACTIVE	CPT
20	14	15	20	ACTIVE	CPT
21	11	17	16	ACTIVE	CPT
22	12	18	17	ACTIVE	CPT
23	13	19	18	ACTIVE	CPT
24	14	20	19	ACTIVE	CPT
25	16	17	22	ACTIVE	CPT
26	17	18	23	ACTIVE	CPT
27	18	19	24	ACTIVE	CPT
28	19	20	25	ACTIVE	CPT
29	16	22	21	ACTIVE	CPT
30	17	23	22	ACTIVE	CPT
31	18	24	23	ACTIVE	CPT
32	19	25	24	ACTIVE	CPT

ELEMENT PROPERTIES----------/

ELEMENT	TYPE	THICKNESS	/--------CURVATURES--------/			/----------THERMAL EXPANSION COEFFICIENTS----------/					
			K1	K2	K12	CAX	CAY	CAZ	CSXY	CSXZ	CSYZ

1	CPT	0.100
2	CPT	0.100
3	CPT	0.100
4	CPT	0.100
5	CPT	0.100
6	CPT	0.100
7	CPT	0.100
8	CPT	0.100
9	CPT	0.100
10	CPT	0.100
11	CPT	0.100
12	CPT	0.100
13	CPT	0.100
14	CPT	0.100
15	CPT	0.100
16	CPT	0.100
17	CPT	0.100
18	CPT	0.100
19	CPT	0.100
20	CPT	0.100
21	CPT	0.100
22	CPT	0.100
23	CPT	0.100
24	CPT	0.100
25	CPT	0.100
26	CPT	0.100
27	CPT	0.100
28	CPT	0.100
29	CPT	0.100
30	CPT	0.100
31	CPT	0.100
32	CPT	0.100

MEMBER CONSTANTS----------/

CONSTANT	STANDARD VALUE	DOMAIN	VALUE	MEMBER LIST
E	0.432000E+07	ALL		
G	0.166000E+07	ALL		
DENSITY	0.172800E+04	ALL		
CTE	0.100000E+01	ALL		
BETA	0.0	ALL		

PAGE - 7

POISSON 0.300000E+00 ALL

```
*************************************
*  END OF DATA FROM  INTERNAL STORAGE  *
*************************************
```

PAGE - 8

STIFFNESS ANALYSIS REDUCE BAND

PAGE - 11

LIST STRESS DISPLACEMENT REACTIONS ALL

```
****************************
*RESULTS OF LATEST ANALYSES*
****************************


 PROBLEM - T1        TITLE - 32  ELEMENTS

 ACTIVE UNITS  FEET KIPS RAD  FAHR SEC  LBM


 LOADING - 1            UNIFORM

/-ELEMENT-//-------------------------------------------------------------------------------------------------------------/

1          CENTROID        VXX    0.126704E-07   VYY   -0.264249E+00
           NODE  7         MXX   -0.261303E+00   MYY   -0.261303E+00   MXY    0.905160E-01
           NODE  1         MXX   -0.336147E-07   MYY   -0.336147E-07   MXY    0.334022E-07
           NODE  2         MXX    0.183144E+00   MYY    0.414362E+00   MXY    0.452580E-01

2          CENTROID        VXX    0.255882E-07   VYY   -0.365211E+00
           NODE  8         MXX   -0.526632E+00   MYY   -0.377997E+00   MXY    0.168867E-02
           NODE  2         MXX    0.637004E-01   MYY    0.212335E+00   MXY    0.396079E-07
           NODE  3         MXX    0.202223E+00   MYY    0.670417E+00   MXY    0.844353E-03

3          CENTROID        VXX    0.208729E-07   VYY   -0.162565E+00
           NODE  9         MXX   -0.360695E+00   MYY   -0.167640E+00   MXY   -0.965272E-01
           NODE  3         MXX    0.827376E-01   MYY    0.275792E+00   MXY    0.993264E-08
           NODE  4         MXX    0.540669E-01   MYY    0.389365E+00   MXY   -0.482636E-01

4          CENTROID        VXX    0.0            VYY    0.0
           NODE  10        MXX    0.0            MYY    0.0            MXY    0.0
           NODE  4         MXX    0.0            MYY    0.0            MXY    0.0
           NODE  5         MXX    0.0            MYY    0.0            MXY    0.0

5          CENTROID        VXX   -0.264249E+00   VYY    0.126704E-07
           NODE  1         MXX   -0.336147E-07   MYY   -0.336147E-07   MXY    0.334022E-07
           NODE  7         MXX   -0.261303E+00   MYY   -0.261303E+00   MXY    0.905160E-01
```

/-ELEMENT-//----------/

	NODE 6	MXX	0.414362E+00	MYY	0.183144E+00	MXY	0.452580E-01
6	CENTROID	VXX	0.101146E-01	VYY	-0.264249E+00		
	NODE 2	MXX	0.385171E+00	MYY	0.533805E+00	MXY	0.905160E-01
	NODE 8	MXX	-0.848283E-01	MYY	0.638062E-01	MXY	0.598071E-01
	NODE 7	MXX	-0.184486E+00	MYY	-0.258219E+00	MXY	0.751615E-01
7	CENTROID	VXX	0.619289E-01	VYY	-0.365211E+00		
	NODE 3	MXX	0.596848E+00	MYY	0.789902E+00	MXY	0.168859E-02
	NODE 9	MXX	0.971220E-03	MYY	0.194026E+00	MXY	-0.537959E-01
	NODE 8	MXX	-0.262507E+00	MYY	-0.334825E+00	MXY	-0.260537E-01
8	CENTROID	VXX	0.162565E+00	VYY	-0.162565E+00		
	NODE 4	MXX	0.443432E+00	MYY	0.443432E+00	MXY	-0.965273E-01
	NODE 10	MXX	0.443432E+00	MYY	0.443432E+00	MXY	-0.965273E-01
	NODE 9	MXX	-0.849025E-01	MYY	-0.849025E-01	MXY	-0.965273E-01
9	CENTROID	VXX	-0.264249E+00	VYY	0.101146E-01		
	NODE 12	MXX	0.638062E-01	MYY	-0.848283E-01	MXY	0.598071E-01
	NODE 6	MXX	0.533805E+00	MYY	0.385171E+00	MXY	0.905160E-01
	NODE 7	MXX	-0.258219E+00	MYY	-0.184486E+00	MXY	0.751615E-01
10	CENTROID	VXX	0.101144E-01	VYY	-0.586092E-01		
	NODE 13	MXX	-0.374411E+00	MYY	-0.374411E+00	MXY	-0.168852E-02
	NODE 7	MXX	-0.181401E+00	MYY	-0.181401E+00	MXY	0.598073E-01
	NODE 8	MXX	-0.187447E+00	MYY	-0.145014E+00	MXY	0.290594E-01
11	CENTROID	VXX	0.619287E-01	VYY	-0.619287E-01		
	NODE 14	MXX	-0.283035E+00	MYY	-0.283035E+00	MXY	-0.537958E-01
	NODE 8	MXX	-0.283035E+00	MYY	-0.283035E+00	MXY	-0.537958E-01
	NODE 9	MXX	-0.817667E-01	MYY	-0.817667E-01	MXY	-0.537958E-01
12	CENTROID	VXX	0.162565E+00	VYY	-0.208729E-07		
	NODE 15	MXX	0.275792E+00	MYY	0.827376E-01	MXY	0.993264E-08
	NODE 9	MXX	-0.167640E+00	MYY	-0.360695E+00	MXY	-0.965272E-01
	NODE 10	MXX	0.389365E+00	MYY	0.540669E-01	MXY	-0.482636E-01
13	CENTROID	VXX	-0.365211E+00	VYY	0.255882E-07		
	NODE 6	MXX	0.212335E+00	MYY	0.637004E-01	MXY	0.396079E-07

/-ELEMENT-//----------/

	NODE 12	MXX	-0.377997E+00	MYY	-0.526632E+00	MXY	0.168867E-02
	NODE 11	MXX	0.670417E+00	MYY	0.202223E+00	MXY	0.844353E-03
14	CENTROID	VXX	-0.586092E-01	VYY	0.101144E-01		
	NODE 7	MXX	-0.181401E+00	MYY	-0.181401E+00	MXY	0.598073E-01
	NODE 13	MXX	-0.374411E+00	MYY	-0.374411E+00	MXY	-0.168852E-02
	NODE 12	MXX	-0.145014E+00	MYY	-0.187447E+00	MXY	0.290594E-01
15	CENTROID	VXX	0.586096E-01	VYY	-0.586096E-01		
	NODE 8	MXX	-0.183931E+00	MYY	-0.183931E+00	MXY	-0.168848E-02
	NODE 14	MXX	-0.183931E+00	MYY	-0.183931E+00	MXY	-0.168848E-02
	NODE 13	MXX	-0.374412E+00	MYY	-0.374412E+00	MXY	-0.168848E-02
16	CENTROID	VXX	0.365211E+00	VYY	-0.619289E-01		
	NODE 9	MXX	0.194026E+00	MYY	0.971220E-03	MXY	-0.537959E-01
	NODE 15	MXX	0.789902E+00	MYY	0.596848E+00	MXY	0.168859E-02
	NODE 14	MXX	-0.334825E+00	MYY	-0.262507E+00	MXY	-0.260537E-01
17	CENTROID	VXX	-0.365211E+00	VYY	0.619289E-01		
	NODE 17	MXX	0.194026E+00	MYY	0.971220E-03	MXY	-0.537959E-01
	NODE 11	MXX	0.789902E+00	MYY	0.596848E+00	MXY	0.168859E-02
	NODE 12	MXX	-0.334825E+00	MYY	-0.262507E+00	MXY	-0.260537E-01
18	CENTROID	VXX	-0.586096E-01	VYY	0.586096E-01		
	NODE 18	MXX	-0.183931E+00	MYY	-0.183931E+00	MXY	-0.168848E-02
	NODE 12	MXX	-0.183931E+00	MYY	-0.183931E+00	MXY	-0.168848E-02
	NODE 13	MXX	-0.374412E+00	MYY	-0.374412E+00	MXY	-0.168848E-02
19	CENTROID	VXX	0.586092E-01	VYY	-0.101144E-01		
	NODE 19	MXX	-0.181401E+00	MYY	-0.181401E+00	MXY	0.598073E-01
	NODE 13	MXX	-0.374411E+00	MYY	-0.374411E+00	MXY	-0.168852E-02
	NODE 14	MXX	-0.145014E+00	MYY	-0.187447E+00	MXY	0.290594E-01
20	CENTROID	VXX	0.365211E+00	VYY	-0.255882E-07		
	NODE 20	MXX	0.212335E+00	MYY	0.637004E-01	MXY	0.396079E-07
	NODE 14	MXX	-0.377997E+00	MYY	-0.526632E+00	MXY	0.168867E-02
	NODE 15	MXX	0.670417E+00	MYY	0.202223E+00	MXY	0.844353E-03
21	CENTROID	VXX	-0.162565E+00	VYY	0.208729E-07		

/-ELEMENT-//----------/

	NODE 11	MXX	0.275792E+00	MYY	0.827376E-01	MXY	0.993264E-08
	NODE 17	MXX	-0.167640E+00	MYY	-0.360695E+00	MXY	-0.965272E-01
	NODE 16	MXX	0.389365E+00	MYY	0.540669E-01	MXY	-0.482636E-01
22	CENTROID	VXX	-0.619287E-01	VYY	0.619287E-01		
	NODE 12	MXX	-0.283035E+00	MYY	-0.283035E+00	MXY	-0.537958E-01
	NODE 18	MXX	-0.283035E+00	MYY	-0.283035E+00	MXY	-0.537958E-01
	NODE 17	MXX	-0.817667E-01	MYY	-0.817667E-01	MXY	-0.537958E-01
23	CENTROID	VXX	-0.101144E-01	VYY	0.586092E-01		
	NODE 13	MXX	-0.374411E+00	MYY	-0.374411E+00	MXY	-0.168852E-02
	NODE 19	MXX	-0.181401E+00	MYY	-0.181401E+00	MXY	0.598073E-01
	NODE 18	MXX	-0.187447E+00	MYY	-0.145014E+00	MXY	0.290594E-01
24	CENTROID	VXX	0.264249E+00	VYY	-0.101146E-01		
	NODE 14	MXX	0.638062E-01	MYY	-0.848283E-01	MXY	0.598071E-01
	NODE 20	MXX	0.533805E+00	MYY	0.385171E+00	MXY	0.905160E-01
	NODE 19	MXX	-0.258219E+00	MYY	-0.184486E+00	MXY	0.751615E-01
25	CENTROID	VXX	-0.162565E+00	VYY	0.162565E+00		
	NODE 22	MXX	0.443432E+00	MYY	0.443432E+00	MXY	-0.965273E-01
	NODE 16	MXX	0.443432E+00	MYY	0.443432E+00	MXY	-0.965273E-01
	NODE 17	MXX	-0.849025E-01	MYY	-0.849025E-01	MXY	-0.965273E-01
26	CENTROID	VXX	-0.619289E-01	VYY	0.365211E+00		
	NODE 23	MXX	0.596848E+00	MYY	0.789902E+00	MXY	0.168859E-02
	NODE 17	MXX	0.971220E-03	MYY	0.194026E+00	MXY	-0.537959E-01
	NODE 18	MXX	-0.262507E+00	MYY	-0.334825E+00	MXY	-0.260537E-01
27	CENTROID	VXX	-0.101146E-01	VYY	0.264249E+00		
	NODE 24	MXX	0.385171E+00	MYY	0.533805E+00	MXY	0.905160E-01
	NODE 18	MXX	-0.848283E-01	MYY	0.638062E-01	MXY	0.598071E-01
	NODE 19	MXX	-0.184486E+00	MYY	-0.258219E+00	MXY	0.751615E-01
28	CENTROID	VXX	0.264249E+00	VYY	-0.126704E-07		
	NODE 25	MXX	-0.336147E-07	MYY	-0.336147E-07	MXY	0.334022E-07
	NODE 19	MXX	-0.261303E+00	MYY	-0.261303E+00	MXY	0.905160E-01
	NODE 20	MXX	0.414362E+00	MYY	0.183144E+00	MXY	0.452580E-01

PAGE - 16

/-ELEMENT-//----------/

29	CENTROID	VXX	0.0	VYY	0.0		
	NODE 16	MXX	0.0	MYY	0.0	MXY	0.0
	NODE 22	MXX	0.0	MYY	0.0	MXY	0.0
	NODE 21	MXX	0.0	MYY	0.0	MXY	0.0
30	CENTROID	VXX	-0.208729E-07	VYY	0.162565E+00		
	NODE 17	MXX	-0.360695E+00	MYY	-0.167640E+00	MXY	-0.965272E-01
	NODE 23	MXX	0.827376E-01	MYY	0.275792E+00	MXY	0.993264E-08
	NODE 22	MXX	0.540669E-01	MYY	0.389365E+00	MXY	-0.482636E-01
31	CENTROID	VXX	-0.255882E-07	VYY	0.365211E+00		
	NODE 18	MXX	-0.526632E+00	MYY	-0.377997E+00	MXY	0.168867E-02
	NODE 24	MXX	0.637004E-01	MYY	0.212335E+00	MXY	0.396079E-07
	NODE 23	MXX	0.202223E+00	MYY	0.670417E+00	MXY	0.844353E-03
32	CENTROID	VXX	-0.126704E-07	VYY	0.264249E+00		
	NODE 19	MXX	-0.261303E+00	MYY	-0.261303E+00	MXY	0.905160E-01
	NODE 25	MXX	-0.336147E-07	MYY	-0.336147E-07	MXY	0.334022E-07
	NODE 24	MXX	0.183144E+00	MYY	0.414362E+00	MXY	0.452580E-01

LOADING - 1 UNIFORM

SUPPORT JOINT REACTION LOADS LOADING - 1

JOINT		FORCE			MOMENT		
		X FORCE	Y FORCE	Z FORCE	X MOMENT	Y MOMENT	Z MOMENT
1	GLOBAL			-0.0242426	0.0736501	-0.0736501	
2	GLOBAL			1.1708298	1.2901487	-0.1533524	
3	GLOBAL			1.5989389	1.8639870	-0.1431310	
4	GLOBAL			0.8751615	1.1357689	0.2570395	
5	GLOBAL			0.2343748	0.0976561	0.0976561	
6	GLOBAL			1.1708298	0.1533525	-1.2901487	
10	GLOBAL			0.8751615	0.2570394	1.1357689	
11	GLOBAL			1.5989389	0.1431310	-1.8639870	
15	GLOBAL			1.5989389	-0.1431310	1.8639870	
16	GLOBAL			0.8751615	-0.2570394	-1.1357689	
20	GLOBAL			1.1708298	-0.1533525	1.2901487	
21	GLOBAL			0.2343748	-0.0976561	-0.0976561	
22	GLOBAL			0.8751615	-1.1357689	-0.2570395	
23	GLOBAL			1.5989389	-1.8639870	0.1431310	
24	GLOBAL			1.1708298	-1.2901487	0.1533524	
25	GLOBAL			-0.0242426	-0.0736501	0.0736501	

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - 1

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
1	GLOBAL			0.0	0.0	0.0	
2	GLOBAL			0.0	0.0	0.0	
3	GLOBAL			0.0	0.0	0.0	
4	GLOBAL			0.0	0.0	0.0	
5	GLOBAL			0.0	0.0	0.0	
6	GLOBAL			0.0	0.0	0.0	
10	GLOBAL			0.0	0.0	0.0	
11	GLOBAL			0.0	0.0	0.0	
15	GLOBAL			0.0	0.0	0.0	
16	GLOBAL			0.0	0.0	0.0	
20	GLOBAL			0.0	0.0	0.0	
21	GLOBAL			0.0	0.0	0.0	
22	GLOBAL			0.0	0.0	0.0	
23	GLOBAL			0.0	0.0	0.0	

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - 1

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
24	GLOBAL			0.0	0.0	0.0	
25	GLOBAL			0.0	0.0	0.0	

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
7	GLOBAL			-0.0018912	-0.0008172	0.0008172	
8	GLOBAL			-0.0028984	-0.0013571	0.0000152	
9	GLOBAL			-0.0016244	-0.0008714	-0.0008714	
12	GLOBAL			-0.0028984	-0.0000152	0.0013571	
13	GLOBAL			-0.0047877	-0.0000000	-0.0000000	
14	GLOBAL			-0.0028984	0.0000152	-0.0013571	
17	GLOBAL			-0.0016244	0.0008714	0.0008714	
18	GLOBAL			-0.0028984	0.0013571	-0.0000152	
19	GLOBAL			-0.0018912	0.0008172	-0.0008172	

PAGE - 19

```
$ PRINT THE NODAL ABERAGE VALUES USING THE SPECIALIZED PROCESSING
$ PROGRAM 'QQSTJTAV' OF APPENDIX M OF STRUDL MANUAL
EXECUTE PROGRAM 'QQSTJTAV'
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*************************
*RESULTS OF LATEST ANALYSIS*
*************************
```

PROBLEM - T1 TITLE - 32 ELEMENTS

ACTIVE UNITS FEET KIPS RAD FAHR SEC LBM

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------
1	1	-0.336147E-07	-0.336147E-07	0.334022E-07	-0.132124E+00	-0.132124E+00
2	1	0.210672E+00	0.386834E+00	0.452580E-01	0.337156E-02	-0.297903E+00
3	1	0.293936E+00	0.578704E+00	0.844316E-03	0.206430E-01	-0.297662E+00
4	1	0.165833E+00	0.277599E+00	-0.482637E-01	0.541882E-01	-0.108376E+00
5	1	0.0	0.0	0.0	0.0	0.0
6	1	0.386834E+00	0.210672E+00	0.452580E-01	-0.297903E+00	0.337156E-02
7	1	-0.221352E+00	-0.221352E+00	0.751615E-01	-0.944796E-01	-0.944796E-01
8	1	-0.254730E+00	-0.210166E+00	0.150287E-02	0.337827E-01	-0.195637E+00
9	1	-0.833344E-01	-0.833344E-01	-0.751615E-01	0.135700E+00	-0.135700E+00
10	1	0.277599E+00	0.165833E+00	-0.482637E-01	0.108376E+00	-0.541882E-01
11	1	0.578704E+00	0.293936E+00	0.844316E-03	-0.297662E+00	0.206430E-01
12	1	-0.210166E+00	-0.254730E+00	0.150286E-02	-0.195637E+00	0.337827E-01
13	1	-0.374412E+00	-0.374412E+00	-0.168850E-02	0.131130E-08	0.190735E-08
14	1	-0.210166E+00	-0.254730E+00	0.150287E-02	0.195637E+00	-0.337827E-01
15	1	0.578704E+00	0.293936E+00	0.844316E-03	0.297662E+00	-0.206430E-01
16	1	0.277599E+00	0.165833E+00	-0.482637E-01	-0.108376E+00	0.541882E-01
17	1	-0.833345E-01	-0.833344E-01	-0.751615E-01	-0.135700E+00	0.135700E+00

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
18	1	-0.254730E+00	-0.210166E+00	0.150287E-02	-0.337827E-01	0.195637E+00
19	1	-0.221352E+00	-0.221352E+00	0.751615E-01	0.944796E-01	0.944796E-01
20	1	0.386834E+00	0.210672E+00	0.452580E-01	0.297903E+00	-0.337156E-02
21	1	0.0	0.0	0.0	0.0	0.0
22	1	0.165833E+00	0.277599E+00	-0.482637E-01	-0.541882E-01	0.108376E+00
23	1	0.293936E+00	0.578704E+00	0.844316E-03	-0.206430E-01	0.297662E+00
24	1	0.210672E+00	0.386834E+00	0.452580E-01	-0.337156E-02	0.297903E+00
25	1	-0.336147E-07	-0.336147E-07	0.334022E-07	0.132124E+00	0.132124E+00

FINISH

```
STRUDL 'T2'   '32  SYMMETRICAL ELEMENTS'
*****************************************************************
*                                                               *
*   MCAUTO STRUDL                          RELEASE 4.5  APR 1981  *
*   MCAUTO STRUDL DYNAL                    RELEASE 6.5            *
*   MCAUTO STRUDL PLOTS                    RELEASE 3.5            *
*                                                               *
*                                                               *
*                    TIME 17.27.27,  2/04/82                    *
*                                                               *
*                  DATA POOL SIZE   30640 BYTES                 *
*                                                               *
*****************************************************************


UNIT KIP FEET                $ BDEROCBSM6

TYPE PLATE BENDING

MESH COORDINATES

  1  TO  5  X  0.  INCR  2.5  Y   0.

  6  TO 10  X  0.  INCR  2.5  Y   2.5

 11  TO 15  X  0.  INCR  2.5  Y   5.

 16  TO 20  X  0.  INCR  2.5  Y   7.5

 21  TO 25  X  0.  INCR  2.5  Y  10.

MESH INCIDENCES

  1  TO  8  /  1 6 7 2 8 8 9 4 / 2 2 2 3 3 4 4 5 / 6 7 8 8 4 9 10 10

  9  TO 16  /  6 11 12 12 13 8 14 14 / 7 6 7 8 8 9 9 10 / 12 12 8 13 14 -
               14 10 15

 17  TO 24  /  11 16 17 12 18 18 19 14 / 12 12 12 13 13 14 14 15 / -
               16 17 18 18 14 19 20 20

 25  TO 32  /  16 21 22 22 23 18 24 24 / 17 16 17 18 18 19 19 20 /  -
               22 22 18 23 24 24 20 25

ELEMENT PROPERTIES

  1 TO 32  TYPE  'CPT'  THICKNESS 0.1
```

PAGE - 3

```
CONSTANTS
  E 4320000.    ALL
  POISSON  0.3  ALL
  G 1660000.    ALL
SUPPORT JOINTS  1  TO  5   21  TO  25  6  11  16  10  15  20
LOADING 'ONE' 'UNIFORM'
ELEMENT LOAD
  1  TO 32  SURFACE FORCE GLOBAL  PZ  -0.15
PRINT STRUCTURAL  DATA
```

PAGE - 4

```
****************************************
*  PROBLEM DATA FROM INTERNAL STORAGE  *
****************************************

JOB ID -  T2          JOB TITLE - 32  SYMMETRICAL ELEMENTS

ACTIVE UNITS -  LENGTH        FORCE        ANGLE       TEMPERATURE      TIME        MASS
                  FEET         KIPS         RAD           FAHR           SEC         LBM


         ********** STRUCTURAL DATA **********


JOINT COORDINATE REFERENCE SYSTEMS ------------------------------------------/
ID.    ORIGIN  X          Y          Z   ROTAT. R1          R2          R3


JOINT COORDINATES-----------------------------------------/  STATUS---/
JOINT            X            Y            Z     CONDITION
```

JOINT	X	Y	Z	CONDITION	STATUS	
1	0.0	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
2	2.500	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
3	5.000	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
4	7.500	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
5	10.000	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
6	0.0	2.500	0.0	SUPPORT	ACTIVE	GLOBAL
7	2.500	2.500	0.0		ACTIVE	GLOBAL
8	5.000	2.500	0.0		ACTIVE	GLOBAL
9	7.500	2.500	0.0		ACTIVE	GLOBAL
10	10.000	2.500	0.0	SUPPORT	ACTIVE	GLOBAL
11	0.0	5.000	0.0	SUPPORT	ACTIVE	GLOBAL
12	2.500	5.000	0.0		ACTIVE	GLOBAL
13	5.000	5.000	0.0		ACTIVE	GLOBAL
14	7.500	5.000	0.0		ACTIVE	GLOBAL
15	10.000	5.000	0.0	SUPPORT	ACTIVE	GLOBAL
16	0.0	7.500	0.0	SUPPORT	ACTIVE	GLOBAL
17	2.500	7.500	0.0		ACTIVE	GLOBAL
18	5.000	7.500	0.0		ACTIVE	GLOBAL
19	7.500	7.500	0.0		ACTIVE	GLOBAL
20	10.000	7.500	0.0	SUPPORT	ACTIVE	GLOBAL
21	0.0	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
22	2.500	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
23	5.000	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
24	7.500	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
25	10.000	10.000	0.0	SUPPORT	ACTIVE	GLOBAL

JOINT RELEASES----------/ELASTIC SUPPORT RELEASES----------/

JOINT	FORCE	MOMENT	THETA 1	THETA 2	THETA 3	KFX	KFY	KFZ	KMX	KMY	KMZ

ELEMENT INCIDENCES----------/--STATUS--/-----/----TYPE----/

ELEMENT	NODES				
1	1	2	6	ACTIVE	CPT
2	6	2	7	ACTIVE	CPT
3	7	2	8	ACTIVE	CPT
4	2	3	8	ACTIVE	CPT
5	8	3	4	ACTIVE	CPT
6	8	4	9	ACTIVE	CPT
7	9	4	10	ACTIVE	CPT
8	4	5	10	ACTIVE	CPT
9	6	7	12	ACTIVE	CPT
10	11	6	12	ACTIVE	CPT
11	12	7	8	ACTIVE	CPT
12	12	8	13	ACTIVE	CPT
13	13	8	14	ACTIVE	CPT
14	8	9	14	ACTIVE	CPT
15	14	9	10	ACTIVE	CPT
16	14	10	15	ACTIVE	CPT
17	11	12	16	ACTIVE	CPT
18	16	12	17	ACTIVE	CPT
19	17	12	18	ACTIVE	CPT
20	12	13	18	ACTIVE	CPT
21	18	13	14	ACTIVE	CPT
22	18	14	19	ACTIVE	CPT
23	19	14	20	ACTIVE	CPT
24	14	15	20	ACTIVE	CPT
25	16	17	22	ACTIVE	CPT
26	21	16	22	ACTIVE	CPT
27	22	17	18	ACTIVE	CPT
28	22	18	23	ACTIVE	CPT
29	23	18	24	ACTIVE	CPT
30	18	19	24	ACTIVE	CPT
31	24	19	20	ACTIVE	CPT
32	24	20	25	ACTIVE	CPT

ELEMENT PROPERTIES----------/

ELEMENT	TYPE	THICKNESS	/--------CURVATURES--------/			/----------THERMAL EXPANSION COEFFICIENTS----------/					
			K1	K2	K12	CAX	CAY	CAZ	CSXY	CSXZ	CSYZ

1	CPT	0.100
2	CPT	0.100
3	CPT	0.100
4	CPT	0.100
5	CPT	0.100
6	CPT	0.100
7	CPT	0.100
8	CPT	0.100
9	CPT	0.100
10	CPT	0.100
11	CPT	0.100
12	CPT	0.100
13	CPT	0.100
14	CPT	0.100
15	CPT	0.100
16	CPT	0.100
17	CPT	0.100
18	CPT	0.100
19	CPT	0.100
20	CPT	0.100
21	CPT	0.100
22	CPT	0.100
23	CPT	0.100
24	CPT	0.100
25	CPT	0.100
26	CPT	0.100
27	CPT	0.100
28	CPT	0.100
29	CPT	0.100
30	CPT	0.100
31	CPT	0.100
32	CPT	0.100

MEMBER CONSTANTS----------/

CONSTANT	STANDARD VALUE	DOMAIN	VALUE	MEMBER LIST
E	0.432000E+07	ALL		
G	0.166000E+07	ALL		
DENSITY	0.172800E+04	ALL		
CTE	0.100000E+01	ALL		
BETA	0.0	ALL		

PAGE - 7

```
POISSON      0.300000E+00    ALL


****************************************
*  END OF DATA FROM  INTERNAL STORAGE  *
****************************************
```

PAGE - 8

```
STIFFNESS ANALYSIS REDUCE BAND
```

PAGE - 11

```
LIST STRESS DISPLACEMENT REACTIONS ALL
```

```
****************************
*RESULTS OF LATEST ANALYSES*
****************************


 PROBLEM - T2        TITLE - 32  SYMMETRICAL ELEMENTS

 ACTIVE UNITS  FEET KIPS RAD  FAHR SEC  LBM


 LOADING - ONE          UNIFORM

/-ELEMENT-//-------------------------------------------------------------------------------------------------------------/

1          CENTROID        VXX    0.0            VYY    0.0
           NODE  2         MXX    0.0            MYY    0.0            MXY    0.0
           NODE  6         MXX    0.0            MYY    0.0            MXY    0.0
           NODE  1         MXX    0.0            MYY    0.0            MXY    0.0

2          CENTROID        VXX   -0.242812E+00   VYY   -0.242812E+00
           NODE  6         MXX    0.556054E+00   MYY    0.556054E+00   MXY    0.869530E-01
           NODE  2         MXX    0.556054E+00   MYY    0.556054E+00   MXY    0.869530E-01
           NODE  7         MXX   -0.233085E+00   MYY   -0.233085E+00   MXY    0.869530E-01

3          CENTROID        VXX   -0.553123E-01   VYY   -0.242812E+00
           NODE  2         MXX    0.326366E+00   MYY    0.487147E+00   MXY    0.869529E-01
           NODE  8         MXX   -0.182460E+00   MYY   -0.216794E-01   MXY    0.738279E-01
           NODE  7         MXX   -0.102305E+00   MYY   -0.202382E+00   MXY    0.803905E-01

4          CENTROID        VXX    0.303005E-07   VYY   -0.343124E+00
           NODE  8         MXX   -0.488671E+00   MYY   -0.327890E+00   MXY    0.410788E-07
           NODE  2         MXX    0.689060E-01   MYY    0.229687E+00   MXY    0.321311E-07
           NODE  3         MXX    0.197578E+00   MYY    0.658592E+00   MXY    0.366050E-07

5          CENTROID        VXX   -0.303005E-07   VYY   -0.343124E+00
           NODE  4         MXX    0.689060E-01   MYY    0.229687E+00   MXY   -0.321311E-07
           NODE  8         MXX   -0.488671E+00   MYY   -0.327890E+00   MXY   -0.410788E-07
```

/-ELEMENT-//----------/

	NODE 3	MXX	0.197578E+00	MYY	0.658592E+00	MXY	-0.366050E-07
6	CENTROID	VXX	0.553123E-01	VYY	-0.242812E+00		
	NODE 8	MXX	-0.182460E+00	MYY	-0.216794E-01	MXY	-0.738279E-01
	NODE 4	MXX	0.326366E+00	MYY	0.487147E+00	MXY	-0.869529E-01
	NODE 9	MXX	-0.102305E+00	MYY	-0.202382E+00	MXY	-0.803905E-01
7	CENTROID	VXX	0.242812E+00	VYY	-0.242812E+00		
	NODE 4	MXX	0.556054E+00	MYY	0.556054E+00	MXY	-0.869530E-01
	NODE 10	MXX	0.556054E+00	MYY	0.556054E+00	MXY	-0.869530E-01
	NODE 9	MXX	-0.233085E+00	MYY	-0.233085E+00	MXY	-0.869530E-01
8	CENTROID	VXX	0.0	VYY	0.0		
	NODE 10	MXX	0.0	MYY	0.0	MXY	0.0
	NODE 4	MXX	0.0	MYY	0.0	MXY	0.0
	NODE 5	MXX	0.0	MYY	0.0	MXY	0.0
9	CENTROID	VXX	-0.242812E+00	VYY	-0.553123E-01		
	NODE 12	MXX	-0.216794E-01	MYY	-0.182460E+00	MXY	0.738279E-01
	NODE 6	MXX	0.487147E+00	MYY	0.326366E+00	MXY	0.869529E-01
	NODE 7	MXX	-0.202382E+00	MYY	-0.102305E+00	MXY	0.803905E-01
10	CENTROID	VXX	-0.343124E+00	VYY	0.303005E-07		
	NODE 6	MXX	0.229687E+00	MYY	0.689060E-01	MXY	0.321311E-07
	NODE 12	MXX	-0.327890E+00	MYY	-0.488671E+00	MXY	0.410788E-07
	NODE 11	MXX	0.658592E+00	MYY	0.197578E+00	MXY	0.366050E-07
11	CENTROID	VXX	-0.553123E-01	VYY	-0.553123E-01		
	NODE 8	MXX	-0.251366E+00	MYY	-0.251366E+00	MXY	0.738279E-01
	NODE 12	MXX	-0.251366E+00	MYY	-0.251366E+00	MXY	0.738279E-01
	NODE 7	MXX	-0.716016E-01	MYY	-0.716016E-01	MXY	0.738279E-01
12	CENTROID	VXX	-0.937501E-01	VYY	-0.937501E-01		
	NODE 12	MXX	-0.146249E+00	MYY	-0.146249E+00	MXY	-0.133768E-06
	NODE 8	MXX	-0.146249E+00	MYY	-0.146249E+00	MXY	-0.133768E-06
	NODE 13	MXX	-0.450937E+00	MYY	-0.450937E+00	MXY	-0.133768E-06
13	CENTROID	VXX	0.937501E-01	VYY	-0.937501E-01		
	NODE 8	MXX	-0.146249E+00	MYY	-0.146249E+00	MXY	0.133768E-06

/-ELEMENT-//----------/

	NODE 14	MXX	-0.146249E+00	MYY	-0.146249E+00	MXY	0.133768E-06
	NODE 13	MXX	-0.450937E+00	MYY	-0.450937E+00	MXY	0.133768E-06
14	CENTROID	VXX	0.553123E-01	VYY	-0.553123E-01		
	NODE 14	MXX	-0.251366E+00	MYY	-0.251366E+00	MXY	-0.738279E-01
	NODE 8	MXX	-0.251366E+00	MYY	-0.251366E+00	MXY	-0.738279E-01
	NODE 9	MXX	-0.716016E-01	MYY	-0.716016E-01	MXY	-0.738279E-01
15	CENTROID	VXX	0.242812E+00	VYY	-0.553123E-01		
	NODE 10	MXX	0.487147E+00	MYY	0.326366E+00	MXY	-0.869529E-01
	NODE 14	MXX	-0.216794E-01	MYY	-0.182460E+00	MXY	-0.738279E-01
	NODE 9	MXX	-0.202382E+00	MYY	-0.102305E+00	MXY	-0.803905E-01
16	CENTROID	VXX	0.343124E+00	VYY	0.303005E-07		
	NODE 14	MXX	-0.327890E+00	MYY	-0.488671E+00	MXY	-0.410788E-07
	NODE 10	MXX	0.229687E+00	MYY	0.689060E-01	MXY	-0.321311E-07
	NODE 15	MXX	0.658592E+00	MYY	0.197578E+00	MXY	-0.366050E-07
17	CENTROID	VXX	-0.343124E+00	VYY	-0.303005E-07		
	NODE 12	MXX	-0.327890E+00	MYY	-0.488671E+00	MXY	-0.410788E-07
	NODE 16	MXX	0.229687E+00	MYY	0.689060E-01	MXY	-0.321311E-07
	NODE 11	MXX	0.658592E+00	MYY	0.197578E+00	MXY	-0.366050E-07
18	CENTROID	VXX	-0.242812E+00	VYY	0.553123E-01		
	NODE 16	MXX	0.487147E+00	MYY	0.326366E+00	MXY	-0.869529E-01
	NODE 12	MXX	-0.216794E-01	MYY	-0.182460E+00	MXY	-0.738279E-01
	NODE 17	MXX	-0.202382E+00	MYY	-0.102305E+00	MXY	-0.803905E-01
19	CENTROID	VXX	-0.553123E-01	VYY	0.553123E-01		
	NODE 12	MXX	-0.251366E+00	MYY	-0.251366E+00	MXY	-0.738279E-01
	NODE 18	MXX	-0.251366E+00	MYY	-0.251366E+00	MXY	-0.738279E-01
	NODE 17	MXX	-0.716016E-01	MYY	-0.716016E-01	MXY	-0.738279E-01
20	CENTROID	VXX	-0.937501E-01	VYY	0.937501E-01		
	NODE 18	MXX	-0.146249E+00	MYY	-0.146249E+00	MXY	0.133768E-06
	NODE 12	MXX	-0.146249E+00	MYY	-0.146249E+00	MXY	0.133768E-06
	NODE 13	MXX	-0.450937E+00	MYY	-0.450937E+00	MXY	0.133768E-06
21	CENTROID	VXX	0.937501E-01	VYY	0.937501E-01		

/-ELEMENT-//----------/

	NODE 14	MXX	-0.146249E+00	MYY	-0.146249E+00	MXY	-0.133768E-06
	NODE 18	MXX	-0.146249E+00	MYY	-0.146249E+00	MXY	-0.133768E-06
	NODE 13	MXX	-0.450937E+00	MYY	-0.450937E+00	MXY	-0.133768E-06
22	CENTROID	VXX	0.553123E-01	VYY	0.553123E-01		
	NODE 18	MXX	-0.251366E+00	MYY	-0.251366E+00	MXY	0.738279E-01
	NODE 14	MXX	-0.251366E+00	MYY	-0.251366E+00	MXY	0.738279E-01
	NODE 19	MXX	-0.716016E-01	MYY	-0.716016E-01	MXY	0.738279E-01
23	CENTROID	VXX	0.242812E+00	VYY	0.553123E-01		
	NODE 14	MXX	-0.216794E-01	MYY	-0.182460E+00	MXY	0.738279E-01
	NODE 20	MXX	0.487147E+00	MYY	0.326366E+00	MXY	0.869529E-01
	NODE 19	MXX	-0.202382E+00	MYY	-0.102305E+00	MXY	0.803905E-01
24	CENTROID	VXX	0.343124E+00	VYY	-0.303005E-07		
	NODE 20	MXX	0.229687E+00	MYY	0.689060E-01	MXY	0.321311E-07
	NODE 14	MXX	-0.327890E+00	MYY	-0.488671E+00	MXY	0.410788E-07
	NODE 15	MXX	0.658592E+00	MYY	0.197578E+00	MXY	0.366050E-07
25	CENTROID	VXX	-0.242812E+00	VYY	0.242812E+00		
	NODE 22	MXX	0.556054E+00	MYY	0.556054E+00	MXY	-0.869530E-01
	NODE 16	MXX	0.556054E+00	MYY	0.556054E+00	MXY	-0.869530E-01
	NODE 17	MXX	-0.233085E+00	MYY	-0.233085E+00	MXY	-0.869530E-01
26	CENTROID	VXX	0.0	VYY	0.0		
	NODE 16	MXX	0.0	MYY	0.0	MXY	0.0
	NODE 22	MXX	0.0	MYY	0.0	MXY	0.0
	NODE 21	MXX	0.0	MYY	0.0	MXY	0.0
27	CENTROID	VXX	-0.553123E-01	VYY	0.242812E+00		
	NODE 18	MXX	-0.182460E+00	MYY	-0.216794E-01	MXY	-0.738279E-01
	NODE 22	MXX	0.326366E+00	MYY	0.487147E+00	MXY	-0.869529E-01
	NODE 17	MXX	-0.102305E+00	MYY	-0.202382E+00	MXY	-0.803905E-01
28	CENTROID	VXX	0.303005E-07	VYY	0.343124E+00		
	NODE 22	MXX	0.689060E-01	MYY	0.229687E+00	MXY	-0.321311E-07
	NODE 18	MXX	-0.488671E+00	MYY	-0.327890E+00	MXY	-0.410788E-07
	NODE 23	MXX	0.197578E+00	MYY	0.658592E+00	MXY	-0.366050E-07

PAGE - 16

/-ELEMENT-//----------/

29	CENTROID	VXX	-0.303005E-07	VYY	0.343124E+00		
	NODE 18	MXX	-0.488671E+00	MYY	-0.327890E+00	MXY	0.410788E-07
	NODE 24	MXX	0.689060E-01	MYY	0.229687E+00	MXY	0.321311E-07
	NODE 23	MXX	0.197578E+00	MYY	0.658592E+00	MXY	0.366050E-07
30	CENTROID	VXX	0.553123E-01	VYY	0.242812E+00		
	NODE 24	MXX	0.326366E+00	MYY	0.487147E+00	MXY	0.869529E-01
	NODE 18	MXX	-0.182460E+00	MYY	-0.216794E-01	MXY	0.738279E-01
	NODE 19	MXX	-0.102305E+00	MYY	-0.202382E+00	MXY	0.803905E-01
31	CENTROID	VXX	0.242812E+00	VYY	0.242812E+00		
	NODE 20	MXX	0.556054E+00	MYY	0.556054E+00	MXY	0.869530E-01
	NODE 24	MXX	0.556054E+00	MYY	0.556054E+00	MXY	0.869530E-01
	NODE 19	MXX	-0.233085E+00	MYY	-0.233085E+00	MXY	0.869530E-01
32	CENTROID	VXX	0.0	VYY	0.0		
	NODE 24	MXX	0.0	MYY	0.0	MXY	0.0
	NODE 20	MXX	0.0	MYY	0.0	MXY	0.0
	NODE 25	MXX	0.0	MYY	0.0	MXY	0.0

LOADING - ONE UNIFORM

SUPPORT JOINT REACTION LOADS LOADING - ONE

JOINT		FORCE			MOMENT		
		X FORCE	Y FORCE	Z FORCE	X MOMENT	Y MOMENT	Z MOMENT
1	GLOBAL			0.2343748	0.0976561	-0.0976561	
2	GLOBAL			1.0945301	1.4667950	-0.4658200	
3	GLOBAL			1.3265610	1.4843731	0.0000000	
4	GLOBAL			1.0945301	1.4667950	0.4658200	
5	GLOBAL			0.2343748	0.0976561	0.0976561	
6	GLOBAL			1.0945301	0.4658200	-1.4667950	
10	GLOBAL			1.0945301	0.4658200	1.4667950	
11	GLOBAL			1.3265610	0.0000000	-1.4843731	
15	GLOBAL			1.3265610	-0.0000000	1.4843731	
16	GLOBAL			1.0945301	-0.4658200	-1.4667950	
20	GLOBAL			1.0945301	-0.4658200	1.4667950	
21	GLOBAL			0.2343748	-0.0976561	-0.0976561	
22	GLOBAL			1.0945301	-1.4667950	-0.4658200	
23	GLOBAL			1.3265610	-1.4843731	-0.0000000	
24	GLOBAL			1.0945301	-1.4667950	0.4658200	
25	GLOBAL			0.2343748	-0.0976561	0.0976561	

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - ONE

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
1	GLOBAL			0.0	0.0	0.0	
2	GLOBAL			0.0	0.0	0.0	
3	GLOBAL			0.0	0.0	0.0	
4	GLOBAL			0.0	0.0	0.0	
5	GLOBAL			0.0	0.0	0.0	
6	GLOBAL			0.0	0.0	0.0	
10	GLOBAL			0.0	0.0	0.0	
11	GLOBAL			0.0	0.0	0.0	
15	GLOBAL			0.0	0.0	0.0	
16	GLOBAL			0.0	0.0	0.0	
20	GLOBAL			0.0	0.0	0.0	
21	GLOBAL			0.0	0.0	0.0	
22	GLOBAL			0.0	0.0	0.0	
23	GLOBAL			0.0	0.0	0.0	

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - ONE

JOINT		/----------DISPLACEMENT----------//			----------ROTATION----------/		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
24	GLOBAL			0.0	0.0	0.0	
25	GLOBAL			0.0	0.0	0.0	

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - ONE

JOINT		/----------DISPLACEMENT----------//			----------ROTATION----------/		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
7	GLOBAL			-0.0017804	-0.0007850	0.0007850	
8	GLOBAL			-0.0029437	-0.0014515	0.0000000	
9	GLOBAL			-0.0017804	-0.0007850	-0.0007850	
12	GLOBAL			-0.0029437	-0.0000000	0.0014515	
13	GLOBAL			-0.0050667	-0.0000000	0.0000000	
14	GLOBAL			-0.0029437	-0.0000000	-0.0014515	
17	GLOBAL			-0.0017804	0.0007850	0.0007850	
18	GLOBAL			-0.0029437	0.0014515	0.0000000	
19	GLOBAL			-0.0017804	0.0007850	-0.0007850	

PAGE - 19

```
$ PRINT THE NODAL AVERAGE VALUES USING THE SPECIALIZED PROCESSING
$ PROGRAM 'QQSTJTAV' OF APPENDIX M OF STRUDL MANUAL
EXECUTE PROGRAM 'QQSTJTAV'
```

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***************************
*RESULTS OF LATEST ANALYSIS*
***************************
```

PROBLEM - T2 TITLE - 32 SYMMETRICAL ELEMENTS

ACTIVE UNITS FEET KIPS RAD FAHR SEC LBM

A V E R A G E N O D A L S T R E S S

//---NODE---//	---LOAD---//	------MXX------//	------MYY------//	------MXY------//	------VX------//	------VY------//
1	ONE	0.0	0.0	0.0	0.0	0.0
2	ONE	0.237832E+00	0.318222E+00	0.434765E-01	-0.745310E-01	-0.207187E+00
3	ONE	0.197578E+00	0.658593E+00	0.0	0.0	-0.343124E+00
4	ONE	0.237832E+00	0.318222E+00	-0.434765E-01	0.745310E-01	-0.207187E+00
5	ONE	0.0	0.0	0.0	0.0	0.0
6	ONE	0.318222E+00	0.237832E+00	0.434765E-01	-0.207187E+00	-0.745310E-01
7	ONE	-0.152343E+00	-0.152343E+00	0.803904E-01	-0.149062E+00	-0.149062E+00
8	ONE	-0.267187E+00	-0.186796E+00	-0.381469E-08	0.143051E-08	-0.183750E+00
9	ONE	-0.152343E+00	-0.152343E+00	-0.803904E-01	0.149062E+00	-0.149062E+00
10	ONE	0.318222E+00	0.237832E+00	-0.434765E-01	0.207187E+00	-0.745310E-01
11	ONE	0.658593E+00	0.197578E+00	0.0	-0.343124E+00	0.0
12	ONE	-0.186796E+00	-0.267187E+00	-0.235247E-08	-0.183750E+00	0.143051E-07
13	ONE	-0.450937E+00	-0.450937E+00	0.0	0.0	0.0
14	ONE	-0.186796E+00	-0.267187E+00	0.322750E-08	0.183750E+00	0.334057E-07
15	ONE	0.658593E+00	0.197578E+00	0.0	0.343124E+00	0.0
16	ONE	0.318222E+00	0.237832E+00	-0.434765E-01	-0.207187E+00	0.745310E-01
17	ONE	-0.152343E+00	-0.152343E+00	-0.803904E-01	-0.149062E+00	0.149062E+00

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
18	ONE	-0.267187E+00	-0.186796E+00	0.381469E-08	0.143051E-08	0.183750E+00
19	ONE	-0.152343E+00	-0.152343E+00	0.803904E-01	0.149062E+00	0.149062E+00
20	ONE	0.318222E+00	0.237832E+00	0.434765E-01	0.207187E+00	0.745310E-01
21	ONE	0.0	0.0	0.0	0.0	0.0
22	ONE	0.237832E+00	0.318222E+00	-0.434765E-01	-0.745310E-01	0.207187E+00
23	ONE	0.197578E+00	0.658593E+00	0.0	0.0	0.343124E+00
24	ONE	0.237832E+00	0.318222E+00	0.434765E-01	0.745310E-01	0.207187E+00
25	ONE	0.0	0.0	0.0	0.0	0.0

FINISH

```
STRUDL 'T3'   '16  ELEMENTS'
*****************************************************************
*                                                               *
*   MCAUTO STRUDL                          RELEASE 4.5  APR 1981  *
*   MCAUTO STRUDL DYNAL                    RELEASE 6.5            *
*   MCAUTO STRUDL PLOTS                    RELEASE 3.5            *
*                                                               *
*                                                               *
*                    TIME 13.10.47,  2/03/82                    *
*                                                               *
*                  DATA POOL SIZE   30640 BYTES                 *
*                                                               *
*****************************************************************


UNIT KIP FEET                $ BDEROCBSM7

TYPE PLATE BENDING

MESH COORDINATES

  1  TO  5  X  0.  INCR  2.5  Y   0.

  6  TO 10  X  0.  INCR  2.5  Y   2.5

 11  TO 15  X  0.  INCR  2.5  Y   5.

 16  TO 20  X  0.  INCR  2.5  Y   7.5

 21  TO 25  X  0.  INCR  2.5  Y  10.

MESH INCIDENCES

  1  TO  4  /  1  TO  4  /  2  TO  5  /  7  TO  10 /  6  TO   9

  5  TO  8  /  6  TO  9  /  7  TO 10  / 12  TO  15 / 11  TO  14

  9  TO 12  / 11  TO 14  / 12  TO 15  / 17  TO  20 / 16  TO  19

 13  TO 16  / 16  TO 19  / 17  TO 20  / 22  TO  25 / 21  TO  24

ELEMENT PROPERTIES

  1 TO 16  TYPE  'BPR'  THICKNESS 0.1

CONSTANTS

  E 4320000.    ALL
```

```
  POISSON  0.3  ALL
  G 1660000.    ALL
SUPPORT JOINTS  1  TO  5   21  TO  25  6  11  16  10  15  20
LOADING 'ONE'  'UNIFORM'
ELEMENT LOAD
  1  TO 16  SURFACE FORCE GLOBAL  PZ  -0.15
PRINT STRUCTURAL  DATA
```

```
****************************************
*  PROBLEM DATA FROM INTERNAL STORAGE  *
****************************************

JOB ID -  T3          JOB TITLE - 16  ELEMENTS

ACTIVE UNITS -  LENGTH        FORCE        ANGLE       TEMPERATURE      TIME        MASS
                  FEET         KIPS         RAD           FAHR           SEC         LBM


         ********** STRUCTURAL DATA **********

JOINT COORDINATE REFERENCE SYSTEMS ----------------------------------------/
ID.    ORIGIN  X          Y          Z   ROTAT. R1          R2          R3


JOINT COORDINATES-----------------------------------------/  STATUS---/
JOINT            X           Y           Z     CONDITION
```

JOINT	X	Y	Z	CONDITION	STATUS	
1	0.0	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
2	2.500	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
3	5.000	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
4	7.500	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
5	10.000	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
6	0.0	2.500	0.0	SUPPORT	ACTIVE	GLOBAL
7	2.500	2.500	0.0		ACTIVE	GLOBAL
8	5.000	2.500	0.0		ACTIVE	GLOBAL
9	7.500	2.500	0.0		ACTIVE	GLOBAL
10	10.000	2.500	0.0	SUPPORT	ACTIVE	GLOBAL
11	0.0	5.000	0.0	SUPPORT	ACTIVE	GLOBAL
12	2.500	5.000	0.0		ACTIVE	GLOBAL
13	5.000	5.000	0.0		ACTIVE	GLOBAL
14	7.500	5.000	0.0		ACTIVE	GLOBAL
15	10.000	5.000	0.0	SUPPORT	ACTIVE	GLOBAL
16	0.0	7.500	0.0	SUPPORT	ACTIVE	GLOBAL
17	2.500	7.500	0.0		ACTIVE	GLOBAL
18	5.000	7.500	0.0		ACTIVE	GLOBAL
19	7.500	7.500	0.0		ACTIVE	GLOBAL
20	10.000	7.500	0.0	SUPPORT	ACTIVE	GLOBAL
21	0.0	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
22	2.500	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
23	5.000	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
24	7.500	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
25	10.000	10.000	0.0	SUPPORT	ACTIVE	GLOBAL

JOINT RELEASES----------/ELASTIC SUPPORT RELEASES----------/

JOINT	FORCE	MOMENT	THETA 1	THETA 2	THETA 3	KFX	KFY	KFZ	KMX	KMY	KMZ

ELEMENT INCIDENCES----------/--STATUS--/-----/----TYPE----/

ELEMENT	NODES						
1	1	2	7	6	ACTIVE	BPR
2	2	3	8	7	ACTIVE	BPR
3	3	4	9	8	ACTIVE	BPR
4	4	5	10	9	ACTIVE	BPR
5	6	7	12	11	ACTIVE	BPR
6	7	8	13	12	ACTIVE	BPR
7	8	9	14	13	ACTIVE	BPR
8	9	10	15	14	ACTIVE	BPR
9	11	12	17	16	ACTIVE	BPR
10	12	13	18	17	ACTIVE	BPR
11	13	14	19	18	ACTIVE	BPR
12	14	15	20	19	ACTIVE	BPR
13	16	17	22	21	ACTIVE	BPR
14	17	18	23	22	ACTIVE	BPR
15	18	19	24	23	ACTIVE	BPR
16	19	20	25	24	ACTIVE	BPR

ELEMENT PROPERTIES----------/

ELEMENT	TYPE	THICKNESS	/--------CURVATURES--------/			/----------THERMAL EXPANSION COEFFICIENTS----------/					
			K1	K2	K12	CAX	CAY	CAZ	CSXY	CSXZ	CSYZ
1	BPR	0.100									
2	BPR	0.100									
3	BPR	0.100									
4	BPR	0.100									
5	BPR	0.100									
6	BPR	0.100									
7	BPR	0.100									
8	BPR	0.100									
9	BPR	0.100									
10	BPR	0.100									
11	BPR	0.100									
12	BPR	0.100									
13	BPR	0.100									
14	BPR	0.100									
15											

```
         BPR        0.100
16       BPR        0.100

MEMBER CONSTANTS-----------------------------------------------------------------------------------------------/
CONSTANT   STANDARD VALUE   DOMAIN          VALUE       MEMBER LIST


   E         0.432000E+07    ALL

   G         0.166000E+07    ALL

DENSITY      0.172800E+04    ALL

  CTE        0.100000E+01    ALL

  BETA       0.0             ALL

POISSON      0.300000E+00    ALL



*************************************
*  END OF DATA FROM  INTERNAL STORAGE  *
*************************************



STIFFNESS ANALYSIS REDUCE BAND


 LIST STRESS DISPLACEMENT REACTIONS ALL
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*RESULTS OF LATEST ANALYSES*
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PROBLEM - T3 TITLE - 16 ELEMENTS

ACTIVE UNITS FEET KIPS RAD FAHR SEC LBM

LOADING - ONE UNIFORM

ELEMENT												
1	NODE	1	MXX	0.0	MYY	0.0	MXY	-8.438939E-02	VX	1.690590E-01	VY	1.690589E-01
	NODE	2	MXX	1.267943E-01	MYY	4.226479E-01	MXY	2.085209E-02	VX	1.690590E-01	VY	-2.666251E-01
	NODE	7	MXX	-1.585449E-01	MYY	-1.585451E-01	MXY	1.260934E-01	VX	-2.666249E-01	VY	-2.666251E-01
	NODE	6	MXX	4.226477E-01	MYY	1.267943E-01	MXY	2.085209E-02	VX	-2.666249E-01	VY	1.690589E-01
2	NODE	2	MXX	1.267943E-01	MYY	4.226479E-01	MXY	4.879400E-02	VX	1.165859E-01	VY	-2.648598E-01
	NODE	3	MXX	2.142339E-01	MYY	7.141132E-01	MXY	-5.644746E-02	VX	1.165859E-01	VY	-4.473242E-01
	NODE	8	MXX	-2.494615E-01	MYY	-2.759958E-01	MXY	1.088232E-02	VX	-6.587833E-02	VY	-4.473242E-01
	NODE	7	MXX	-1.541315E-01	MYY	-1.572211E-01	MXY	1.161236E-01	VX	-6.587833E-02	VY	-2.648598E-01
3	NODE	3	MXX	2.142341E-01	MYY	7.141140E-01	MXY	5.644744E-02	VX	-1.165859E-01	VY	-4.473246E-01
	NODE	4	MXX	1.267946E-01	MYY	4.226486E-01	MXY	-4.879405E-02	VX	-1.165859E-01	VY	-2.648607E-01
	NODE	9	MXX	-1.541323E-01	MYY	-1.572222E-01	MXY	-1.161238E-01	VX	6.587780E-02	VY	-2.648607E-01
	NODE	8	MXX	-2.494612E-01	MYY	-2.759960E-01	MXY	-1.088231E-02	VX	6.587780E-02	VY	-4.473246E-01
4	NODE	4	MXX	1.267945E-01	MYY	4.226484E-01	MXY	-2.085203E-02	VX	-1.690592E-01	VY	-2.666256E-01
	NODE	5	MXX	0.0	MYY	0.0	MXY	8.438939E-02	VX	-1.690592E-01	VY	1.690592E-01
	NODE	10	MXX	4.226479E-01	MYY	1.267943E-01	MXY	-2.085190E-02	VX	2.666256E-01	VY	1.690592E-01
	NODE	9	MXX	-1.585457E-01	MYY	-1.585456E-01	MXY	-1.260934E-01	VX	2.666256E-01	VY	-2.666256E-01
5	NODE	6	MXX	4.226479E-01	MYY	1.267943E-01	MXY	4.879396E-02	VX	-2.648598E-01	VY	1.165859E-01
	NODE	7	MXX	-1.572211E-01	MYY	-1.541315E-01	MXY	1.161236E-01	VX	-2.648598E-01	VY	-6.587833E-02
	NODE	12	MXX	-2.759958E-01	MYY	-2.494615E-01	MXY	1.088212E-02	VX	-4.473242E-01	VY	-6.587833E-02
	NODE	11	MXX	7.141132E-01	MYY	2.142339E-01	MXY	-5.644752E-02	VX	-4.473242E-01	VY	1.165859E-01
6	NODE	7	MXX	-1.528073E-01	MYY	-1.528072E-01	MXY	9.618294E-02	VX	-4.821801E-02	VY	-4.821802E-02

PAGE - 12

/-ELEMENT-//----------/

	NODE	8	MXX	-2.348921E-01	MYY	-2.274311E-01	MXY	2.885327E-02	VX	-4.821801E-02	VY	-1.142054E-01
	NODE	13	MXX	-4.167453E-01	MYY	-4.167453E-01	MXY	-3.847645E-02	VX	-1.142054E-01	VY	-1.142054E-01
	NODE	12	MXX	-2.274310E-01	MYY	-2.348922E-01	MXY	2.885324E-02	VX	-1.142054E-01	VY	-4.821802E-02
7	NODE	8	MXX	-2.348917E-01	MYY	-2.274309E-01	MXY	-2.885344E-02	VX	4.821809E-02	VY	-1.142048E-01
	NODE	9	MXX	-1.528074E-01	MYY	-1.528060E-01	MXY	-9.618312E-02	VX	4.821809E-02	VY	-4.821964E-02
	NODE	14	MXX	-2.274334E-01	MYY	-2.348941E-01	MXY	-2.885341E-02	VX	1.142032E-01	VY	-4.821964E-02
	NODE	13	MXX	-4.167433E-01	MYY	-4.167448E-01	MXY	3.847628E-02	VX	1.142032E-01	VY	-1.142048E-01
8	NODE	9	MXX	-1.572218E-01	MYY	-1.541318E-01	MXY	-1.161237E-01	VX	2.648602E-01	VY	-6.587833E-02
	NODE	10	MXX	4.226481E-01	MYY	1.267942E-01	MXY	-4.879396E-02	VX	2.648602E-01	VY	1.165861E-01
	NODE	15	MXX	7.141135E-01	MYY	2.142342E-01	MXY	5.644754E-02	VX	4.473246E-01	VY	1.165861E-01
	NODE	14	MXX	-2.759965E-01	MYY	-2.494617E-01	MXY	-1.088220E-02	VX	4.473246E-01	VY	-6.587833E-02
9	NODE	11	MXX	7.141140E-01	MYY	2.142341E-01	MXY	5.644744E-02	VX	-4.473246E-01	VY	-1.165859E-01
	NODE	12	MXX	-2.759960E-01	MYY	-2.494612E-01	MXY	-1.088231E-02	VX	-4.473246E-01	VY	6.587785E-02
	NODE	17	MXX	-1.572219E-01	MYY	-1.541322E-01	MXY	-1.161238E-01	VX	-2.648605E-01	VY	6.587785E-02
	NODE	16	MXX	4.226486E-01	MYY	1.267946E-01	MXY	-4.879406E-02	VX	-2.648605E-01	VY	-1.165859E-01
10	NODE	12	MXX	-2.274308E-01	MYY	-2.348914E-01	MXY	-2.885331E-02	VX	-1.142052E-01	VY	4.821743E-02
	NODE	13	MXX	-4.167451E-01	MYY	-4.167441E-01	MXY	3.847637E-02	VX	-1.142052E-01	VY	1.142044E-01
	NODE	18	MXX	-2.348927E-01	MYY	-2.274321E-01	MXY	-2.885331E-02	VX	-4.821821E-02	VY	1.142044E-01
	NODE	17	MXX	-1.528073E-01	MYY	-1.528080E-01	MXY	-9.618300E-02	VX	-4.821821E-02	VY	4.821743E-02
11	NODE	13	MXX	-4.167448E-01	MYY	-4.167446E-01	MXY	-3.847640E-02	VX	1.142050E-01	VY	1.142048E-01
	NODE	14	MXX	-2.274312E-01	MYY	-2.348920E-01	MXY	2.885328E-02	VX	1.142050E-01	VY	4.821793E-02
	NODE	19	MXX	-1.528074E-01	MYY	-1.528074E-01	MXY	9.618300E-02	VX	4.821814E-02	VY	4.821793E-02
	NODE	18	MXX	-2.348923E-01	MYY	-2.274316E-01	MXY	2.885331E-02	VX	4.821814E-02	VY	1.142048E-01
12	NODE	14	MXX	-2.759963E-01	MYY	-2.494610E-01	MXY	1.088230E-02	VX	4.473242E-01	VY	6.587768E-02
	NODE	15	MXX	7.141135E-01	MYY	2.142341E-01	MXY	-5.644740E-02	VX	4.473242E-01	VY	-1.165859E-01
	NODE	20	MXX	4.226484E-01	MYY	1.267945E-01	MXY	4.879409E-02	VX	2.648607E-01	VY	-1.165859E-01
	NODE	19	MXX	-1.572222E-01	MYY	-1.541324E-01	MXY	1.161237E-01	VX	2.648607E-01	VY	6.587768E-02
13	NODE	16	MXX	4.226484E-01	MYY	1.267945E-01	MXY	-2.085200E-02	VX	-2.666256E-01	VY	-1.690592E-01
	NODE	17	MXX	-1.585457E-01	MYY	-1.585459E-01	MXY	-1.260934E-01	VX	-2.666256E-01	VY	2.666258E-01
	NODE	22	MXX	1.267945E-01	MYY	4.226484E-01	MXY	-2.085190E-02	VX	1.690592E-01	VY	2.666258E-01
	NODE	21	MXX	0.0	MYY	0.0	MXY	8.438939E-02	VX	1.690592E-01	VY	-1.690592E-01
14	NODE	17	MXX	-1.541318E-01	MYY	-1.572217E-01	MXY	-1.161237E-01	VX	-6.587827E-02	VY	2.648602E-01
	NODE	18	MXX	-2.494617E-01	MYY	-2.759965E-01	MXY	-1.088222E-02	VX	-6.587827E-02	VY	4.473244E-01
	NODE	23	MXX	2.142341E-01	MYY	7.141132E-01	MXY	5.644744E-02	VX	1.165860E-01	VY	4.473244E-01
	NODE	22	MXX	1.267943E-01	MYY	4.226481E-01	MXY	-4.879402E-02	VX	1.165860E-01	VY	2.648602E-01
15	NODE	18	MXX	-2.494612E-01	MYY	-2.759963E-01	MXY	1.088227E-02	VX	6.587797E-02	VY	4.473246E-01
	NODE	19	MXX	-1.541321E-01	MYY	-1.572218E-01	MXY	1.161238E-01	VX	6.587797E-02	VY	2.648602E-01
	NODE	24	MXX	1.267945E-01	MYY	4.226484E-01	MXY	4.879409E-02	VX	-1.165859E-01	VY	2.648602E-01

PAGE - 13

/-ELEMENT-//----------/

	NODE	23	MXX	2.142341E-01	MYY	7.141135E-01	MXY	-5.644744E-02	VX	-1.165859E-01	VY	4.473246E-01
16	NODE	19	MXX	-1.585457E-01	MYY	-1.585460E-01	MXY	1.260935E-01	VX	2.666256E-01	VY	2.666258E-01
	NODE	20	MXX	4.226481E-01	MYY	1.267943E-01	MXY	2.085203E-02	VX	2.666256E-01	VY	-1.690591E-01
	NODE	25	MXX	0.0	MYY	0.0	MXY	-8.438933E-02	VX	-1.690592E-01	VY	-1.690591E-01
	NODE	24	MXX	1.267945E-01	MYY	4.226484E-01	MXY	2.085214E-02	VX	-1.690592E-01	VY	2.666258E-01

LOADING - ONE UNIFORM

SUPPORT JOINT REACTION LOADS LOADING - ONE

JOINT		FORCE			MOMENT		
		X FORCE	Y FORCE	Z FORCE	X MOMENT	Y MOMENT	Z MOMENT
1	GLOBAL			0.1493830	0.2140245	-0.2140245	
2	GLOBAL			1.0024529	1.2175617	-0.0717425	
3	GLOBAL			1.5957069	1.8165979	0.0000001	
4	GLOBAL			1.0024529	1.2175617	0.0717426	
5	GLOBAL			0.1493830	0.2140245	0.2140244	
6	GLOBAL			1.0024529	0.0717427	-1.2175617	
10	GLOBAL			1.0024529	0.0717427	1.2175617	
11	GLOBAL			1.5957060	0.0000001	-1.8165979	
15	GLOBAL			1.5957060	0.0000001	1.8165979	
16	GLOBAL			1.0024529	-0.0717425	-1.2175617	
20	GLOBAL			1.0024519	-0.0717425	1.2175617	
21	GLOBAL			0.1493830	-0.2140245	-0.2140244	
22	GLOBAL			1.0024529	-1.2175617	-0.0717422	
23	GLOBAL			1.5957060	-1.8165979	0.0000005	
24	GLOBAL			1.0024529	-1.2175617	0.0717429	
25	GLOBAL			0.1493829	-0.2140245	0.2140245	

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - ONE

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
1	GLOBAL			0.0	0.0	0.0	
2	GLOBAL			0.0	0.0	0.0	
3	GLOBAL			0.0	0.0	0.0	
4	GLOBAL			0.0	0.0	0.0	
5	GLOBAL			0.0	0.0	0.0	
6	GLOBAL			0.0	0.0	0.0	
10	GLOBAL			0.0	0.0	0.0	
11	GLOBAL			0.0	0.0	0.0	
15	GLOBAL			0.0	0.0	0.0	
16	GLOBAL			0.0	0.0	0.0	
20	GLOBAL			0.0	0.0	0.0	
21	GLOBAL			0.0	0.0	0.0	
22	GLOBAL			0.0	0.0	0.0	
23	GLOBAL			0.0	0.0	0.0	

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - ONE

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
24	GLOBAL			0.0	0.0	0.0	
25	GLOBAL			0.0	0.0	0.0	

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - ONE

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
7	GLOBAL			-0.0019046	-0.0009501	0.0009501	
8	GLOBAL			-0.0031786	-0.0015579	0.0000000	
9	GLOBAL			-0.0019046	-0.0009501	-0.0009501	
12	GLOBAL			-0.0031786	0.0000000	0.0015579	
13	GLOBAL			-0.0053210	0.0000000	-0.0000000	
14	GLOBAL			-0.0031786	0.0000000	-0.0015579	
17	GLOBAL			-0.0019046	0.0009501	0.0009501	
18	GLOBAL			-0.0031786	0.0015579	-0.0000000	
19	GLOBAL			-0.0019046	0.0009501	-0.0009501	

```
$ PRINT THE NODAL AVERAGE VALUES USING THE SPECIALIZED PROCESSING
$ PROGRAM  'QQSTJTAV'  OF APPENDIX M OF STRUDL MANUAL
EXECUTE PROGRAM 'QQSTJTAV'
```

```
****************************
*RESULTS OF LATEST ANALYSIS*
****************************
```

PROBLEM - T3 TITLE - 16 ELEMENTS

ACTIVE UNITS FEET KIPS RAD FAHR SEC LBM

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------
1	ONE	0.0	0.0	-0.843894E-01	0.169059E+00	0.169059E+00
2	ONE	0.126794E+00	0.422648E+00	0.348230E-01	0.142823E+00	-0.265742E+00
3	ONE	0.214234E+00	0.714114E+00	-0.762939E-08	0.514984E-07	-0.447324E+00
4	ONE	0.126795E+00	0.422649E+00	-0.348230E-01	-0.142823E+00	-0.265743E+00
5	ONE	0.0	0.0	0.843894E-01	-0.169059E+00	0.169059E+00
6	ONE	0.422648E+00	0.126794E+00	0.348230E-01	-0.265742E+00	0.142822E+00
7	ONE	-0.155676E+00	-0.155676E+00	0.113631E+00	-0.161395E+00	-0.161395E+00
8	ONE	-0.242177E+00	-0.251713E+00	-0.419617E-07	-0.111580E-06	-0.280765E+00
9	ONE	-0.155677E+00	-0.155676E+00	-0.113631E+00	0.161395E+00	-0.161396E+00
10	ONE	0.422648E+00	0.126794E+00	-0.348229E-01	0.265743E+00	0.142823E+00
11	ONE	0.714114E+00	0.214234E+00	-0.381470E-07	-0.447324E+00	0.514984E-07
12	ONE	-0.251713E+00	-0.242177E+00	-0.724792E-07	-0.280765E+00	-0.274658E-06
13	ONE	-0.416745E+00	-0.416745E+00	-0.495911E-07	-0.609398E-06	-0.208855E-06
14	ONE	-0.251714E+00	-0.242177E+00	-0.643730E-08	0.280764E+00	-0.595093E-06
15	ONE	0.714113E+00	0.214234E+00	0.686645E-07	0.447324E+00	0.125885E-06
16	ONE	0.422649E+00	0.126795E+00	-0.348230E-01	-0.265743E+00	-0.142823E+00
17	ONE	-0.155677E+00	-0.155677E+00	-0.113631E+00	-0.161396E+00	0.161395E+00

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Discussion of Results

Due to the symmetries of the geometry and loading, the normal displacement (Z_p) at joints 7, 9, 17 and 19 should be all equal. Table 8.9.3.1 presents the displacement normal to the plane of the plate for joints 7, 9, 17 and 19 for patterns 'T1,' 'T2' and 'T3.'

Table 8.9.3.1

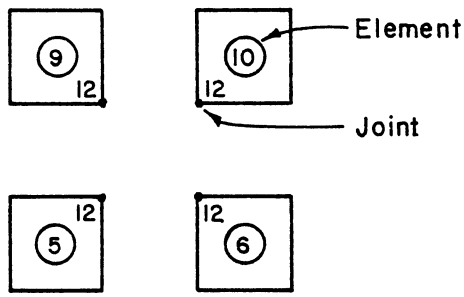
Joint	'T1' (Ft.)	'T2' (Ft.)	'T3' (Ft.)
7	0.0018912	0.0017805	0.0019046
9	0.0016244	0.0017805	0.0019046
17	0.0016244	0.0017805	0.0019046
19	0.0018912	0.0017805	0.0019046

The results of pattern 'T1' are not really symmetrical. This is because the pattern 'T1' accumulates asymmetries along the diagonal of the plate. This explains the equal displacement of joint 7 and 9, and joint 9 with joint 17. Meanwhile, pattern 'T2' gives symmetrical results since the element asymmetries cancelled one another as illustrated in the discretization pattern. The results of pattern 'T3,' using the rectangular elements 'BPR,' clearly illustrate the asymmetry effect is only inherent to the triangular element.

8.9.4 Specialized Processing Program 'QQSTJTAV'

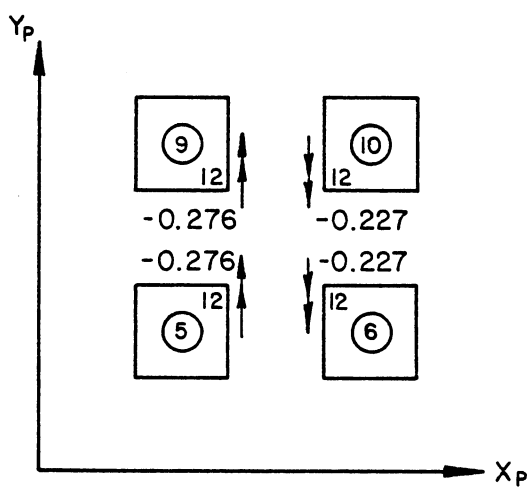
There is a special postprocessing feature that is available in STRUDL to compute the average nodal stresses (moment and shear) results for the 'CPT' and 'BPR' plate bending elements. The detailed description of this command is explained in the STRUDL user manual appendix Section M.

Suppose that the nodal average of M_{xx} at joint 12 of pattern 'T3' is needed. The M_{xx} at joint 12 is contributed by elements 5, 6, 9 and 10.



Generally, the average nodal value is obtained by the sum of the element result divided by the total number of elements connected to the joints.

In this case (for the 'T1' pattern)



$$\overline{M}_{xx_{e12}} = \frac{-0.276-0.276-0.2}{4}$$

$$= -0.252 \ \frac{\text{K-Ft}}{\text{Ft}}$$

The STRUDL command

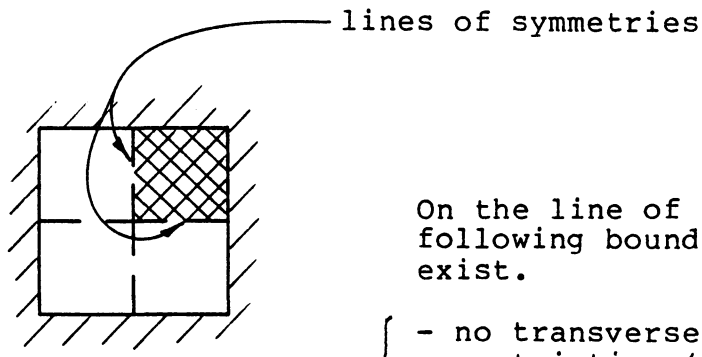
[EXECUTE PROGRAM 'QQSTJTAV']

would produce the same result at joint 12, M_{xx} = -0.252 as shown above. This simple command can greatly simplify the tedious nodal average computations.

8.9.5 Boundary Conditions:

If the geometry and the loading produce symmetric responses, the user should make use of this behavior to minimize the size of the problem.

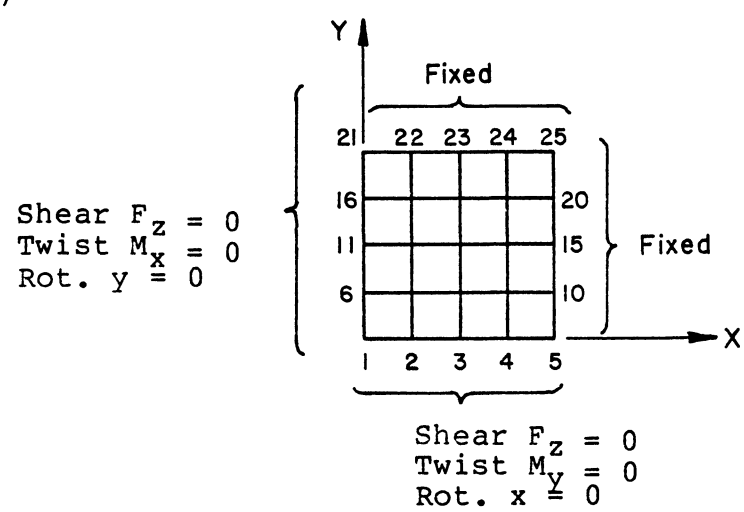
The square clamped plate under uniform load can be reduced to 1/4 of the plate.



On the line of symmetry the following boundary conditions exist.

- no transverse shear force
- no twisting (torsional) moment
- no normal rotation

If the 'T3' pattern is the quarter plate (the upper right hand corner)



The following STRUDL commands can be used to describe the boundary conditions of the plate.

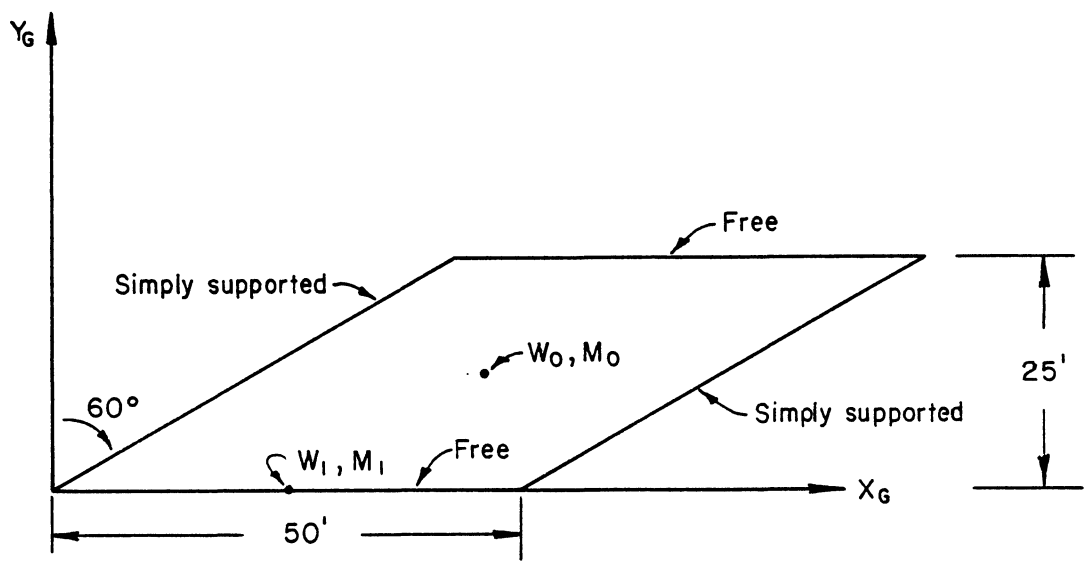
```
SUPPORT JOINTS 1 TO 5 21 TO 25 6 11 16 10 15 20
JOINT 2 3 4 RELEASE FORCE Z MOMENT Y
JOINT 6 11 16 RELEASE FORCE Z MOMENT X
JOINT 1       RELEASE FORCE Z
```

Notice that at joint 1, only the force z is released. This is because along line 1-5 rotation x equals zero and along line 1 to 21 rotation y equals zero. Hence, at joint 1 there is no rotation x and rotation y. On the other hand, the moment restriction along line 1 to 5 is no twist moment y; this means rotation y is free (released), also along line 1 to 21 is no twist moment x or rotation x is released. Hence, at joint 1 due to the moment restriction the rot. y and rot. x are released. There is a contradiction here. However, because STRUDL uses displacement as its primary unknown of formulation; hence, the displacement boundary conditions (i.e., no rotation x and rotation y) must be satisfied first.

8.9.5 Example of a Skew Slab Bridge under Dead Load

For the given simple span skew slab bridge shown in Figure 8.9.5.1, find:

- maximum moment (M_o) and deflection (W_o) at the center of the slab.
- maximum moment (M_1) and deflection (W_1) at the center free edge of the slab.



$E = 432{,}000\ K/Ft_2$ $\qquad G = \frac{E}{2(1+\nu)} = 180{,}000\ KSF$

$N = 0.2$
$h = 9''$
$DL = 0.15\ K/Ft^2$

8.10 HYBRID (SHELL) ELEMENTS

If a thin plate is subjected to both in-plane and bending displacement and/or loading, then a hybrid element must be used. The STRUDL command of TYPE PLATE specifies this kind of element.

The hybrid element is a linear superposition of plane stress and plate bending elements. Therefore, the in-plane and bending effects are uncoupled.

There are currently three types of hybrid elements available in the STRUDL library. These are the 'SBCT,' the 'PBCT2' and the 'PBSQ2' elements. The 'SBCT' is a triangular element and has 5 degrees of freedom (U_1, U_2, U_3, U_4 and U_5) per node. This element is made up of a superposition of the plane stress 'CSTG' and the plate bending 'CPT' elements. The 'PBST2' element is also a triangular element but it has 6 degrees of freedom (U_1, U_2, U_3, U_4, U_5 and U_6) per node. The normal rotation, U_6, in this element is defined arbitrarily as the product of 10^{-3} times the smallest diagonal stiffness term. This additional degree of freedom is added for numerical stability only. The 'PBSQ2' is a quadrilateral element which is formed by two triangular 'PBST2' elements. Hence, 'PBSQ2' possesses the same characteristics of the 'PBST2.'

8.10.1 Convention of Output Results

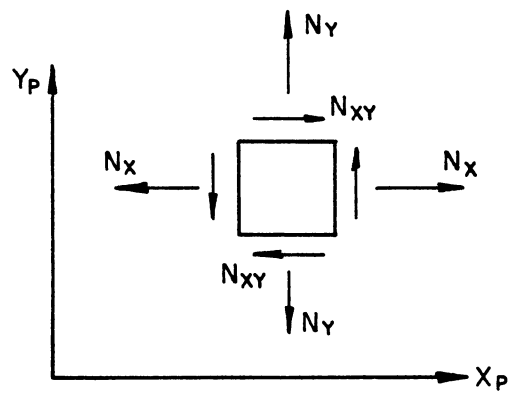
The hybrid element reports the results of stresses in terms of planer coordinates. The results of the in-plane and the bending effect are reported independently.

For the 'SBCT' element, the in-plane effect is reported in terms of stresses (force/area) just like the 'CSTG' element, and the bending effect is reported in terms of moment per unit length the same as the 'CPT' element.

For 'PBST2' and 'PBSQ2' elements, the in-plane effects are output in resultant forces, N_x, N_y, N_{xy} as force per unit length. The bending effects are output in the same way as for the plate bending element.

The sign convention for the resultant forces N_x, N_y, N_{xy} reported at the middle surface of the plate is shown here.

In-plane effect

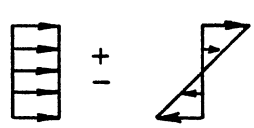


To obtain stresses from the resultant force N_x, N_y and N_{xy}, the following formulas are used. Note, the in-plane stress is constant along the depth of the plate.

$$\begin{cases} \sigma_x = N_x/h \\ \sigma_y = N_y/h \\ \tau_{xy} = N_{xy}/h \end{cases} \qquad \text{where } h = \text{thickness of the plate}$$

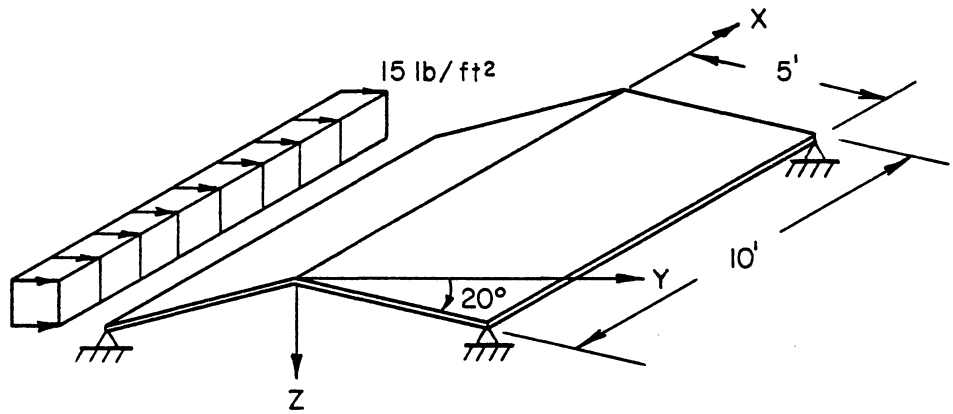
Hence, the total stress at a given cross section of the hybrid element is the combination of the in-plane and bending effects.

$$\sigma_{x_{total}} = \frac{N_x}{h} \pm \frac{12 M_{xx} Z_p}{h^3}$$



8.10.2 Examples of a Folded Plate Using Hybrid Element

A steel folded plate structure under a uniform wind load of 15 lb/ft2. Find the stress distribution on the plates.



E = 432,000 KSF
N = 0.3

Again, the steps presented in Section 8.7 are used to code this problem.

Steps:

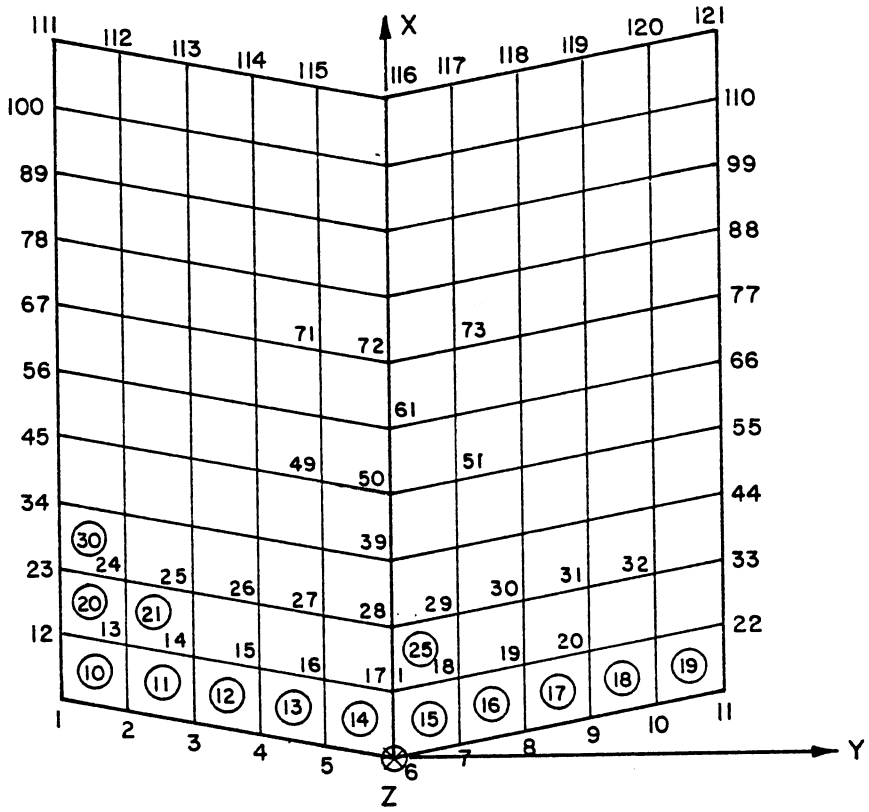
1) Select Mathematical Model and Initialize

The loading produces in-plane and bending effects. To take this into account a hybrid element must be used. The following STRUDL commands initialize the problem.

```
STRUDL 'SHELL' 'FOLDED PLATE USING PBSQ2'
UNIT FEET DEGREE KIP
TYPE PLATE
```

2) Discretize the Geometry and Select Element
The 'PBSQ2' hybrid element is used for this problem.

The following mesh is used for the analysis.



The coding of the node location is performed with the structural generation option 1, explained in the STRUDL user manual, section 6.2.1.

The following STRUDL commands describe the node locations, element incidences, and element properties.

3) Boundary Conditions:
Only the corners are simply supported joints for this problem. Hence:

```
SUPPORT JOINTS 1 111 11 121
JOINT 1 111 11 121  RELEASE MOMENT X
```

4) Define Loading:

The only load on this problem is the wind load. However, because the 'PBSQ2' is formed by two triangular element 'PBST2,' and the element incidence for this problem is not chosen to cancel the effect of asymmetry a symmetric joint load is also defined. This joint is applied at joint 61 and is used to check the geometry and to see the effect of the asymmetry for this problem.

The wind load is defined with the use of the ELEMENT LOAD command.

The following STRUDL commands define the two loadings.

```
LOADING 1 'SYMMETRY JOINT LOAD'
JOINT 61 LOAD FORCE Z 1.
LOADING 2 'SIDE WIND LOAD'
ELEMENT LOAD SURFACE FORCE GLOBAL PY 0.15
10 to 14 20 to 24 30 to 34 40 to 44 50 to 54 60 to 64-
70 to 74 80 to 84 90 to 94 100 to 104
```

5) Check Input:

For this kind of three dimensional model, the geometry of the problem must be carefully checked before the actual problem is executed.

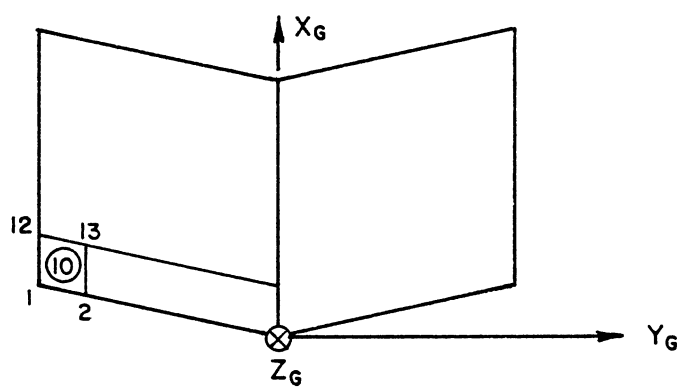
Refer to STRUDL User Manual Appendix I for plotting instructions.

6) Assemble and Solve:

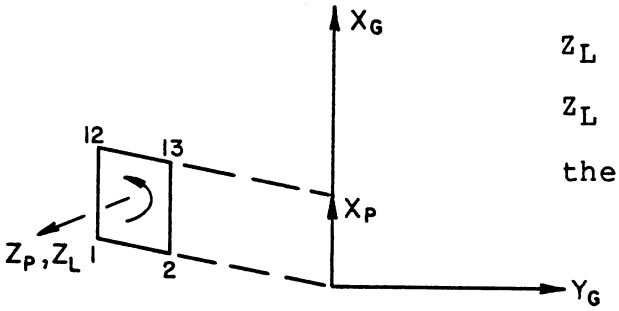
The command [STIFFNESS ANALYSIS REDUCE BAND] is used to assemble and solve the problem.

7) Print Output and Interpretation of Results:

The stresses of the 'PBSQ2' element are reported at the centroid of each element in planar coordinates.



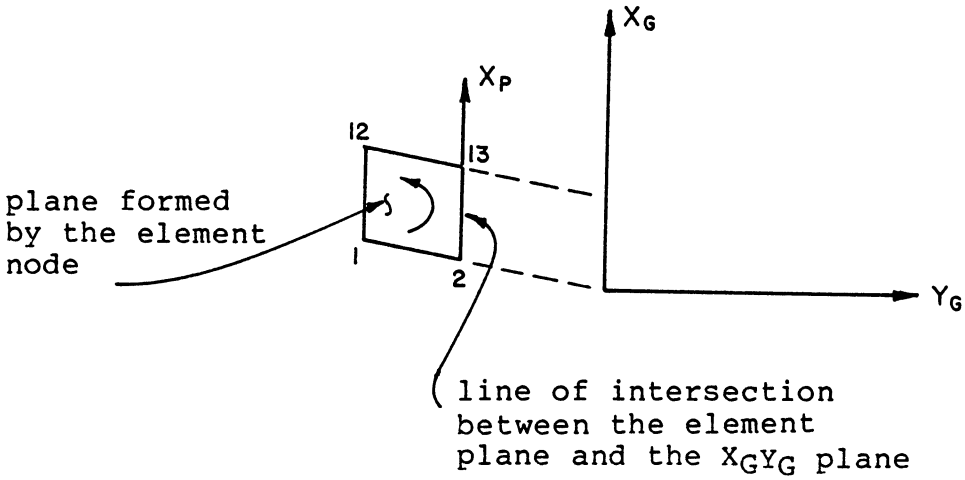
For element 10, the element incidence is 1 2 13 12 (counterclockwise)



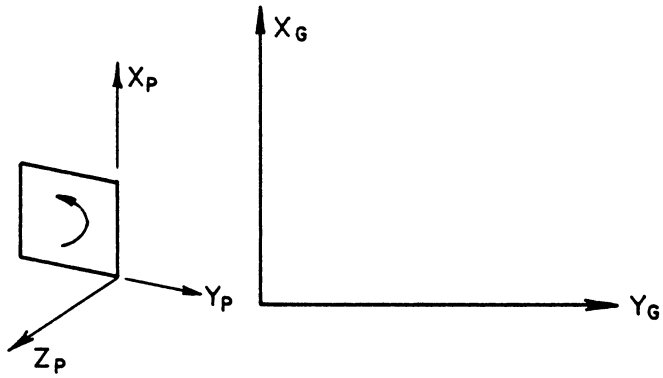
Z_L is not parallel to Z_G

Z_L is not parallel nor is it on the XZ global plane

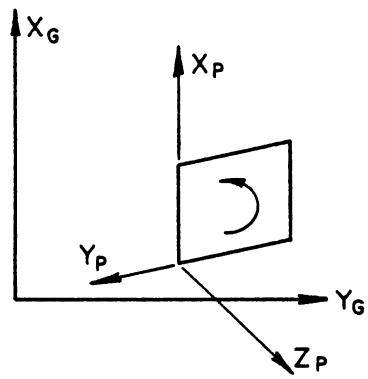
Since Z_L or Z_P is not parallel to Z_G, nor is it on or parallel to the XZ global plane; X_P is taken along the line of intersection of the plane formed by the element nodes and the XY plane. The direction of X_P is such that its projection onto the positive X_G axis is positive.



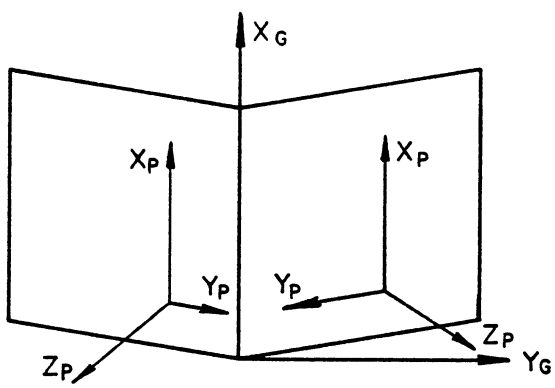
Z_p is equal to Z_L and the Y_p is defined by the cross product of Z_p cross X_p. Hence, element 10 and all elements on the left hand side of the structure plate have the following planar coordinates.



Similarly, for the right hand plate element keeping the element incidence numbering counterclockwise, the following planar coordinate system is found.



So, for this problem there are two different planar coordinate systems, the left side and the right side element of the folded plate.



The following are the input and output STRUDL commands used for this problem.

```
STRUDL 'SHELL'  'FOLDED PLATE USING PBSQ2'
*****************************************************************
*                                                               *
*   MCAUTO STRUDL                          RELEASE 4.5  APR 1981  *
*   MCAUTO STRUDL DYNAL                    RELEASE 6.5            *
*   MCAUTO STRUDL PLOTS                    RELEASE 3.5            *
*                                                               *
*                                                               *
*                    TIME 17.39.15,  2/04/82                    *
*                                                               *
*                  DATA POOL SIZE   30640 BYTES                 *
*                                                               *
*****************************************************************


$                                          BDEROCBSM8

$ A FOLDED PLATE UNDER SIDE WIND LOAD, USING SHELL (HYBRID) ELEMENT

$   'PBSQ2'

$ NODE GEOMETRY IS GENERATED USING STRUCTURAL GENERATION OPTION 1

$   (DIVIDE LINE)

$     INTRODUCING:

$                 - SPECIAL POST PROCESSING COMMAND 'QQSTDPBS'

$                 - CONTOUR PLOT

$

UNITS FEET DEGREES KIPS

$ GENERATE THE NODAL POINT COORDINATES UNSING STRUCTURAL GENERATION

$ OPTION 1, SECTION 6.2.1

JOINT COORDINATES

  1   0.   -4.69846   1.71010   SUPPORT

  6   0.    0.         0.

 11   0.   4.69846    1.71010   S

111  10.  -4.69846    1.71010   S
```

116 10. 0. 0.

121 10. 4.69846 1.71010 S

DIVIDE LINE

COORDINATES OF GENERATED JOINTS

1 TO 6				
	2	0.0	-3.759	1.368
	3	0.0	-2.819	1.026
	4	0.0	-1.879	0.684
	5	0.0	-0.940	0.342
6 TO 11				
	7	0.0	0.940	0.342
	8	0.0	1.879	0.684
	9	0.0	2.819	1.026
	10	0.0	3.759	1.368
1 TO 111 BY 11				
	12	1.000	-4.698	1.710
	23	2.000	-4.698	1.710
	34	3.000	-4.698	1.710
	45	4.000	-4.698	1.710
	56	5.000	-4.698	1.710
	67	6.000	-4.698	1.710
	78	7.000	-4.698	1.710
	89	8.000	-4.698	1.710
	100	9.000	-4.698	1.710
6 TO 116 BY 11				
	17	1.000	0.0	0.0
	28	2.000	0.0	0.0
	39	3.000	0.0	0.0
	50	4.000	0.0	0.0
	61	5.000	0.0	0.0
	72	6.000	0.0	0.0
	83	7.000	0.0	0.0
	94	8.000	0.0	0.0
	105	9.000	0.0	0.0
11 TO 121 BY 11				
	22	1.000	4.698	1.710
	33	2.000	4.698	1.710
	44	3.000	4.698	1.710
	55	4.000	4.698	1.710
	66	5.000	4.698	1.710
	77	6.000	4.698	1.710

	88	7.000	4.698	1.710
	99	8.000	4.698	1.710
	110	9.000	4.698	1.710
111 TO 116				
	112	10.000	-3.759	1.368
	113	10.000	-2.819	1.026
	114	10.000	-1.879	0.684
	115	10.000	-0.940	0.342
116 TO 121				
	117	10.000	0.940	0.342
	118	10.000	1.879	0.684
	119	10.000	2.819	1.026
	120	10.000	3.759	1.368
2 TO 112 BY 11				
	13	1.000	-3.759	1.368
	24	2.000	-3.759	1.368
	35	3.000	-3.759	1.368
	46	4.000	-3.759	1.368
	57	5.000	-3.759	1.368
	68	6.000	-3.759	1.368
	79	7.000	-3.759	1.368
	90	8.000	-3.759	1.368
	101	9.000	-3.759	1.368
3 TO 113 BY 11				
	14	1.000	-2.819	1.026
	25	2.000	-2.819	1.026
	36	3.000	-2.819	1.026
	47	4.000	-2.819	1.026
	58	5.000	-2.819	1.026
	69	6.000	-2.819	1.026
	80	7.000	-2.819	1.026
	91	8.000	-2.819	1.026
	102	9.000	-2.819	1.026
4 TO 114 BY 11				
	15	1.000	-1.879	0.684
	26	2.000	-1.879	0.684
	37	3.000	-1.879	0.684
	48	4.000	-1.879	0.684
	59	5.000	-1.879	0.684
	70	6.000	-1.879	0.684
	81	7.000	-1.879	0.684
	92	8.000	-1.879	0.684
	103	9.000	-1.879	0.684
5 TO 115 BY 11				

	16	1.000	-0.940	0.342
	27	2.000	-0.940	0.342
	38	3.000	-0.940	0.342
	49	4.000	-0.940	0.342
	60	5.000	-0.940	0.342
	71	6.000	-0.940	0.342
	82	7.000	-0.940	0.342
	93	8.000	-0.940	0.342
	104	9.000	-0.940	0.342
7 TO 117 BY 11				
	18	1.000	0.940	0.342
	29	2.000	0.940	0.342
	40	3.000	0.940	0.342
	51	4.000	0.940	0.342
	62	5.000	0.940	0.342
	73	6.000	0.940	0.342
	84	7.000	0.940	0.342
	95	8.000	0.940	0.342
	106	9.000	0.940	0.342
8 TO 118 BY 11				
	19	1.000	1.879	0.684
	30	2.000	1.879	0.684
	41	3.000	1.879	0.684
	52	4.000	1.879	0.684
	63	5.000	1.879	0.684
	74	6.000	1.879	0.684
	85	7.000	1.879	0.684
	96	8.000	1.879	0.684
	107	9.000	1.879	0.684
9 TO 119 BY 11				
	20	1.000	2.819	1.026
	31	2.000	2.819	1.026
	42	3.000	2.819	1.026
	53	4.000	2.819	1.026
	64	5.000	2.819	1.026
	75	6.000	2.819	1.026
	86	7.000	2.819	1.026
	97	8.000	2.819	1.026
	108	9.000	2.819	1.026
10 TO 120 BY 11				
	21	1.000	3.759	1.368
	32	2.000	3.759	1.368
	43	3.000	3.759	1.368
	54	4.000	3.759	1.368
	65	5.000	3.759	1.368
	76	6.000	3.759	1.368

```
                                        87          7.000     3.759     1.368
                                        98          8.000     3.759     1.368
                                       109          9.000     3.759     1.368

$ DEFINE STRUCTURAL TYPE BEFORE THE ELEMENT INCIDENCES

TYPE PLATE

MESH INCIDENCES

 10  TO  19  /   1  TO 10  /   2  TO  11  /  13  TO  22  /  12  TO  21

 20  TO  29  /  12  TO 21  /  13  TO  22  /  24  TO  33  /  23  TO  32

 30  TO  39  /  23  TO 32  /  24  TO  33  /  35  TO  44  /  34  TO  43

 40  TO  49  /  34  TO 43  /  35  TO  44  /  46  TO  55  /  45  TO  54

 50  TO  59  /  45  TO 54  /  46  TO  55  /  57  TO  66  /  56  TO  65

 60  TO  69  /  56  TO 65  /  57  TO  66  /  68  TO  77  /  67  TO  76

 70  TO  79  /  67  TO 76  /  68  TO  77  /  79  TO  88  /  78  TO  87

 80  TO  89  /  78  TO 87  /  79  TO  88  /  90  TO  99  /  89  TO  98

 90  TO  99  /  89  TO 98  /  90  TO  99  / 101  TO 110  / 100  TO 109

100  TO 109  / 100  TO 109 / 101  TO 110  / 112  TO  121 / 111  TO 120

$ DEFINE ELEMENT PROPERTIES

ELEMENT PROPERTIES

 10  TO  109  TYPE 'PBSQ2'  THICKNESS  0.5

CONSTANTS

E 4320000.    ALL

POISSON  0.3  ALL

G 1660000.    ALL

$ DEFINE BOUNDARY CONDITIONS

SUPPORT JOINTS 1  111  11  121

JOINT 1  111  11  121  RELEASE MOMENT X

$ LOADING
```

```
$ LOAD TO CHECK SYMMETRY

LOADING 1  'SYMMETRY JOINT LOAD'

JOINT 61  LOAD FORCE Z  1.

$ WIND LOAD USING ELEMENT SURFACE LOAD

LOADING 2  'SIDE WIND LOAD'

ELEMENT LOAD SURFACE FORCE GLOBAL PY .15

 10 TO 14  20 TO 24  30 TO 34  40 TO 44  50 TO 54  60 TO 64  70 TO 74 -
           80 TO 84  90 TO 94  100 TO 104

PRINT STRUCTURAL DATA
```

```
****************************************
*  PROBLEM DATA FROM INTERNAL STORAGE  *
****************************************

JOB ID -  SHELL        JOB TITLE - FOLDED PLATE USING PBSQ2

ACTIVE UNITS -  LENGTH        FORCE        ANGLE       TEMPERATURE      TIME        MASS
                  FEET         KIPS         DEG.          FAHR           SEC         LBM


         ********** STRUCTURAL DATA **********

JOINT COORDINATE REFERENCE SYSTEMS ------------------------------------------/
ID.    ORIGIN  X          Y          Z   ROTAT. R1          R2          R3
```

JOINT COORDINATES	X	Y	Z	CONDITION	STATUS	
JOINT						
1	0.0	-4.698	1.710	SUPPORT	ACTIVE	GLOBAL
6	0.0	0.0	0.0		ACTIVE	GLOBAL
11	0.0	4.698	1.710	SUPPORT	ACTIVE	GLOBAL
111	10.000	-4.698	1.710	SUPPORT	ACTIVE	GLOBAL
116	10.000	0.0	0.0		ACTIVE	GLOBAL
121	10.000	4.698	1.710	SUPPORT	ACTIVE	GLOBAL
2	0.0	-3.759	1.368		ACTIVE	GLOBAL
3	0.0	-2.819	1.026		ACTIVE	GLOBAL
4	0.0	-1.879	0.684		ACTIVE	GLOBAL
5	0.0	-0.940	0.342		ACTIVE	GLOBAL
7	0.0	0.940	0.342		ACTIVE	GLOBAL
8	0.0	1.879	0.684		ACTIVE	GLOBAL
9	0.0	2.819	1.026		ACTIVE	GLOBAL
10	0.0	3.759	1.368		ACTIVE	GLOBAL
12	1.000	-4.698	1.710		ACTIVE	GLOBAL
23	2.000	-4.698	1.710		ACTIVE	GLOBAL
34	3.000	-4.698	1.710		ACTIVE	GLOBAL
45	4.000	-4.698	1.710		ACTIVE	GLOBAL
56	5.000	-4.698	1.710		ACTIVE	GLOBAL
67	6.000	-4.698	1.710		ACTIVE	GLOBAL
78	7.000	-4.698	1.710		ACTIVE	GLOBAL
89	8.000	-4.698	1.710		ACTIVE	GLOBAL
100	9.000	-4.698	1.710		ACTIVE	GLOBAL
17	1.000	0.0	0.0		ACTIVE	GLOBAL
28	2.000	0.0	0.0		ACTIVE	GLOBAL
39	3.000	0.0	0.0		ACTIVE	GLOBAL

50	4.000	0.0	0.0	ACTIVE	GLOBAL
61	5.000	0.0	0.0	ACTIVE	GLOBAL
72	6.000	0.0	0.0	ACTIVE	GLOBAL
83	7.000	0.0	0.0	ACTIVE	GLOBAL
94	8.000	0.0	0.0	ACTIVE	GLOBAL
105	9.000	0.0	0.0	ACTIVE	GLOBAL
22	1.000	4.698	1.710	ACTIVE	GLOBAL
33	2.000	4.698	1.710	ACTIVE	GLOBAL
44	3.000	4.698	1.710	ACTIVE	GLOBAL
55	4.000	4.698	1.710	ACTIVE	GLOBAL
66	5.000	4.698	1.710	ACTIVE	GLOBAL
77	6.000	4.698	1.710	ACTIVE	GLOBAL
88	7.000	4.698	1.710	ACTIVE	GLOBAL
99	8.000	4.698	1.710	ACTIVE	GLOBAL
110	9.000	4.698	1.710	ACTIVE	GLOBAL
112	10.000	-3.759	1.368	ACTIVE	GLOBAL
113	10.000	-2.819	1.026	ACTIVE	GLOBAL
114	10.000	-1.879	0.684	ACTIVE	GLOBAL
115	10.000	-0.940	0.342	ACTIVE	GLOBAL
117	10.000	0.940	0.342	ACTIVE	GLOBAL
118	10.000	1.879	0.684	ACTIVE	GLOBAL
119	10.000	2.819	1.026	ACTIVE	GLOBAL
120	10.000	3.759	1.368	ACTIVE	GLOBAL
13	1.000	-3.759	1.368	ACTIVE	GLOBAL
24	2.000	-3.759	1.368	ACTIVE	GLOBAL
35	3.000	-3.759	1.368	ACTIVE	GLOBAL
46	4.000	-3.759	1.368	ACTIVE	GLOBAL
57	5.000	-3.759	1.368	ACTIVE	GLOBAL
68	6.000	-3.759	1.368	ACTIVE	GLOBAL
79	7.000	-3.759	1.368	ACTIVE	GLOBAL
90	8.000	-3.759	1.368	ACTIVE	GLOBAL
101	9.000	-3.759	1.368	ACTIVE	GLOBAL
14	1.000	-2.819	1.026	ACTIVE	GLOBAL
25	2.000	-2.819	1.026	ACTIVE	GLOBAL
36	3.000	-2.819	1.026	ACTIVE	GLOBAL
47	4.000	-2.819	1.026	ACTIVE	GLOBAL
58	5.000	-2.819	1.026	ACTIVE	GLOBAL
69	6.000	-2.819	1.026	ACTIVE	GLOBAL
80	7.000	-2.819	1.026	ACTIVE	GLOBAL
91	8.000	-2.819	1.026	ACTIVE	GLOBAL
102	9.000	-2.819	1.026	ACTIVE	GLOBAL
15	1.000	-1.879	0.684	ACTIVE	GLOBAL
26	2.000	-1.879	0.684	ACTIVE	GLOBAL
37	3.000	-1.879	0.684	ACTIVE	GLOBAL
48	4.000	-1.879	0.684	ACTIVE	GLOBAL
59	5.000	-1.879	0.684	ACTIVE	GLOBAL
70	6.000	-1.879	0.684	ACTIVE	GLOBAL
81	7.000	-1.879	0.684	ACTIVE	GLOBAL
92	8.000	-1.879	0.684	ACTIVE	GLOBAL

103	9.000	-1.879	0.684	ACTIVE	GLOBAL
16	1.000	-0.940	0.342	ACTIVE	GLOBAL
27	2.000	-0.940	0.342	ACTIVE	GLOBAL
38	3.000	-0.940	0.342	ACTIVE	GLOBAL
49	4.000	-0.940	0.342	ACTIVE	GLOBAL
60	5.000	-0.940	0.342	ACTIVE	GLOBAL
71	6.000	-0.940	0.342	ACTIVE	GLOBAL
82	7.000	-0.940	0.342	ACTIVE	GLOBAL
93	8.000	-0.940	0.342	ACTIVE	GLOBAL
104	9.000	-0.940	0.342	ACTIVE	GLOBAL
18	1.000	0.940	0.342	ACTIVE	GLOBAL
29	2.000	0.940	0.342	ACTIVE	GLOBAL
40	3.000	0.940	0.342	ACTIVE	GLOBAL
51	4.000	0.940	0.342	ACTIVE	GLOBAL
62	5.000	0.940	0.342	ACTIVE	GLOBAL
73	6.000	0.940	0.342	ACTIVE	GLOBAL
84	7.000	0.940	0.342	ACTIVE	GLOBAL
95	8.000	0.940	0.342	ACTIVE	GLOBAL
106	9.000	0.940	0.342	ACTIVE	GLOBAL
19	1.000	1.879	0.684	ACTIVE	GLOBAL
30	2.000	1.879	0.684	ACTIVE	GLOBAL
41	3.000	1.879	0.684	ACTIVE	GLOBAL
52	4.000	1.879	0.684	ACTIVE	GLOBAL
63	5.000	1.879	0.684	ACTIVE	GLOBAL
74	6.000	1.879	0.684	ACTIVE	GLOBAL
85	7.000	1.879	0.684	ACTIVE	GLOBAL
96	8.000	1.879	0.684	ACTIVE	GLOBAL
107	9.000	1.879	0.684	ACTIVE	GLOBAL
20	1.000	2.819	1.026	ACTIVE	GLOBAL
31	2.000	2.819	1.026	ACTIVE	GLOBAL
42	3.000	2.819	1.026	ACTIVE	GLOBAL
53	4.000	2.819	1.026	ACTIVE	GLOBAL
64	5.000	2.819	1.026	ACTIVE	GLOBAL
75	6.000	2.819	1.026	ACTIVE	GLOBAL
86	7.000	2.819	1.026	ACTIVE	GLOBAL
97	8.000	2.819	1.026	ACTIVE	GLOBAL
108	9.000	2.819	1.026	ACTIVE	GLOBAL
21	1.000	3.759	1.368	ACTIVE	GLOBAL
32	2.000	3.759	1.368	ACTIVE	GLOBAL
43	3.000	3.759	1.368	ACTIVE	GLOBAL
54	4.000	3.759	1.368	ACTIVE	GLOBAL
65	5.000	3.759	1.368	ACTIVE	GLOBAL
76	6.000	3.759	1.368	ACTIVE	GLOBAL
87	7.000	3.759	1.368	ACTIVE	GLOBAL
98	8.000	3.759	1.368	ACTIVE	GLOBAL
109	9.000	3.759	1.368	ACTIVE	GLOBAL

JOINT RELEASES----------/ELASTIC SUPPORT RELEASES----------/

JOINT	FORCE	MOMENT	THETA 1	THETA 2	THETA 3	KFX	KFY	KFZ	KMX	KMY	KMZ
1		X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11		X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
111		X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
121		X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ELEMENT INCIDENCES----------/--STATUS--/-----/----TYPE----/

ELEMENT	NODES					
10	1	2	13	12	ACTIVE	PBSQ2
11	2	3	14	13	ACTIVE	PBSQ2
12	3	4	15	14	ACTIVE	PBSQ2
13	4	5	16	15	ACTIVE	PBSQ2
14	5	6	17	16	ACTIVE	PBSQ2
15	6	7	18	17	ACTIVE	PBSQ2
16	7	8	19	18	ACTIVE	PBSQ2
17	8	9	20	19	ACTIVE	PBSQ2
18	9	10	21	20	ACTIVE	PBSQ2
19	10	11	22	21	ACTIVE	PBSQ2
20	12	13	24	23	ACTIVE	PBSQ2
21	13	14	25	24	ACTIVE	PBSQ2
22	14	15	26	25	ACTIVE	PBSQ2
23	15	16	27	26	ACTIVE	PBSQ2
24	16	17	28	27	ACTIVE	PBSQ2
25	17	18	29	28	ACTIVE	PBSQ2
26	18	19	30	29	ACTIVE	PBSQ2
27	19	20	31	30	ACTIVE	PBSQ2
28	20	21	32	31	ACTIVE	PBSQ2
29	21	22	33	32	ACTIVE	PBSQ2
30	23	24	35	34	ACTIVE	PBSQ2
31	24	25	36	35	ACTIVE	PBSQ2
32	25	26	37	36	ACTIVE	PBSQ2
33	26	27	38	37	ACTIVE	PBSQ2
34	27	28	39	38	ACTIVE	PBSQ2
35	28	29	40	39	ACTIVE	PBSQ2
36	29	30	41	40	ACTIVE	PBSQ2
37	30	31	42	41	ACTIVE	PBSQ2
38	31	32	43	42	ACTIVE	PBSQ2
39	32	33	44	43	ACTIVE	PBSQ2
40	34	35	46	45	ACTIVE	PBSQ2
41	35	36	47	46	ACTIVE	PBSQ2
42	36	37	48	47	ACTIVE	PBSQ2
43	37	38	49	48	ACTIVE	PBSQ2
44	38	39	50	49	ACTIVE	PBSQ2
45	39	40	51	50	ACTIVE	PBSQ2
46	40	41	52	51	ACTIVE	PBSQ2
47						

PAGE - 12

	41	42	53	52	ACTIVE	PBSQ2
48	42	43	54	53	ACTIVE	PBSQ2
49	43	44	55	54	ACTIVE	PBSQ2
50	45	46	57	56	ACTIVE	PBSQ2
51	46	47	58	57	ACTIVE	PBSQ2
52	47	48	59	58	ACTIVE	PBSQ2
53	48	49	60	59	ACTIVE	PBSQ2
54	49	50	61	60	ACTIVE	PBSQ2
55	50	51	62	61	ACTIVE	PBSQ2
56	51	52	63	62	ACTIVE	PBSQ2
57	52	53	64	63	ACTIVE	PBSQ2
58	53	54	65	64	ACTIVE	PBSQ2
59	54	55	66	65	ACTIVE	PBSQ2
60	56	57	68	67	ACTIVE	PBSQ2
61	57	58	69	68	ACTIVE	PBSQ2
62	58	59	70	69	ACTIVE	PBSQ2
63	59	60	71	70	ACTIVE	PBSQ2
64	60	61	72	71	ACTIVE	PBSQ2
65	61	62	73	72	ACTIVE	PBSQ2
66	62	63	74	73	ACTIVE	PBSQ2
67	63	64	75	74	ACTIVE	PBSQ2
68	64	65	76	75	ACTIVE	PBSQ2
69	65	66	77	76	ACTIVE	PBSQ2
70	67	68	79	78	ACTIVE	PBSQ2
71	68	69	80	79	ACTIVE	PBSQ2
72	69	70	81	80	ACTIVE	PBSQ2
73	70	71	82	81	ACTIVE	PBSQ2
74	71	72	83	82	ACTIVE	PBSQ2
75	72	73	84	83	ACTIVE	PBSQ2
76	73	74	85	84	ACTIVE	PBSQ2
77	74	75	86	85	ACTIVE	PBSQ2
78	75	76	87	86	ACTIVE	PBSQ2
79	76	77	88	87	ACTIVE	PBSQ2
80	78	79	90	89	ACTIVE	PBSQ2
81	79	80	91	90	ACTIVE	PBSQ2
82	80	81	92	91	ACTIVE	PBSQ2
83	81	82	93	92	ACTIVE	PBSQ2
84	82	83	94	93	ACTIVE	PBSQ2
85	83	84	95	94	ACTIVE	PBSQ2
86	84	85	96	95	ACTIVE	PBSQ2
87	85	86	97	96	ACTIVE	PBSQ2
88	86	87	98	97	ACTIVE	PBSQ2
89	87	88	99	98	ACTIVE	PBSQ2
90	89	90	101	100	ACTIVE	PBSQ2
91	90	91	102	101	ACTIVE	PBSQ2
92	91	92	103	102	ACTIVE	PBSQ2
93	92	93	104	103	ACTIVE	PBSQ2
94	93	94	105	104	ACTIVE	PBSQ2
95	94	95	106	105	ACTIVE	PBSQ2
96						

	95	96	107	106	ACTIVE	PBSQ2
97	96	97	108	107	ACTIVE	PBSQ2
98	97	98	109	108	ACTIVE	PBSQ2
99	98	99	110	109	ACTIVE	PBSQ2
100	100	101	112	111	ACTIVE	PBSQ2
101	101	102	113	112	ACTIVE	PBSQ2
102	102	103	114	113	ACTIVE	PBSQ2
103	103	104	115	114	ACTIVE	PBSQ2
104	104	105	116	115	ACTIVE	PBSQ2
105	105	106	117	116	ACTIVE	PBSQ2
106	106	107	118	117	ACTIVE	PBSQ2
107	107	108	119	118	ACTIVE	PBSQ2
108	108	109	120	119	ACTIVE	PBSQ2
109	109	110	121	120	ACTIVE	PBSQ2

ELEMENT PROPERTIES----------/

ELEMENT	TYPE	THICKNESS	/--------CURVATURES--------/			/----------THERMAL EXPANSION COEFFICIENTS----------/					
			K1	K2	K12	CAX	CAY	CAZ	CSXY	CSXZ	CSYZ
10	PBSQ2	0.500									
11	PBSQ2	0.500									
12	PBSQ2	0.500									
13	PBSQ2	0.500									
14	PBSQ2	0.500									
15	PBSQ2	0.500									
16	PBSQ2	0.500									
17	PBSQ2	0.500									
18	PBSQ2	0.500									
19	PBSQ2	0.500									
20	PBSQ2	0.500									
21	PBSQ2	0.500									
22	PBSQ2	0.500									
23	PBSQ2	0.500									
24	PBSQ2	0.500									
25	PBSQ2	0.500									
26	PBSQ2	0.500									
27	PBSQ2	0.500									
28	PBSQ2	0.500									
29	PBSQ2	0.500									
30	PBSQ2	0.500									
31	PBSQ2	0.500									
32	PBSQ2	0.500									
33	PBSQ2	0.500									
34	PBSQ2	0.500									
35	PBSQ2	0.500									
36											

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          PBSQ2      0.500
   37     PBSQ2      0.500
   38     PBSQ2      0.500
   39     PBSQ2      0.500
   40     PBSQ2      0.500
   41     PBSQ2      0.500
   42     PBSQ2      0.500
   43     PBSQ2      0.500
   44     PBSQ2      0.500
   45     PBSQ2      0.500
   46     PBSQ2      0.500
   47     PBSQ2      0.500
   48     PBSQ2      0.500
   49     PBSQ2      0.500
   50     PBSQ2      0.500
   51     PBSQ2      0.500
   52     PBSQ2      0.500
   53     PBSQ2      0.500
   54     PBSQ2      0.500
   55     PBSQ2      0.500
   56     PBSQ2      0.500
   57     PBSQ2      0.500
   58     PBSQ2      0.500
   59     PBSQ2      0.500
   60     PBSQ2      0.500
   61     PBSQ2      0.500
   62     PBSQ2      0.500
   63     PBSQ2      0.500
   64     PBSQ2      0.500
   65     PBSQ2      0.500
   66     PBSQ2      0.500
   67     PBSQ2      0.500
   68     PBSQ2      0.500
   69     PBSQ2      0.500
   70     PBSQ2      0.500
   71     PBSQ2      0.500
   72     PBSQ2      0.500
   73     PBSQ2      0.500
   74     PBSQ2      0.500
   75     PBSQ2      0.500
   76     PBSQ2      0.500
   77     PBSQ2      0.500
   78     PBSQ2      0.500
   79     PBSQ2      0.500
   80     PBSQ2      0.500
   81     PBSQ2      0.500
   82     PBSQ2      0.500
   83     PBSQ2      0.500
   84     PBSQ2      0.500
   85
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         PBSQ2      0.500
86       PBSQ2      0.500
87       PBSQ2      0.500
88       PBSQ2      0.500
89       PBSQ2      0.500
90       PBSQ2      0.500
91       PBSQ2      0.500
92       PBSQ2      0.500
93       PBSQ2      0.500
94       PBSQ2      0.500
95       PBSQ2      0.500
96       PBSQ2      0.500
97       PBSQ2      0.500
98       PBSQ2      0.500
99       PBSQ2      0.500
100      PBSQ2      0.500
101      PBSQ2      0.500
102      PBSQ2      0.500
103      PBSQ2      0.500
104      PBSQ2      0.500
105      PBSQ2      0.500
106      PBSQ2      0.500
107      PBSQ2      0.500
108      PBSQ2      0.500
109      PBSQ2      0.500

MEMBER CONSTANTS-----------------------------------------------------------------------------------------------/
CONSTANT   STANDARD VALUE   DOMAIN          VALUE       MEMBER LIST


   E         0.432000E+07   ALL

   G         0.166000E+07   ALL

DENSITY      0.172800E+04   ALL

  CTE        0.100000E+01   ALL

  BETA       0.0            ALL

POISSON      0.300000E+00   ALL


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*  END OF DATA FROM  INTERNAL STORAGE  *
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*RESULTS OF LATEST ANALYSES*
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 PROBLEM - SHELL     TITLE - FOLDED PLATE USING PBSQ2

 ACTIVE UNITS  FEET KIPS DEG. FAHR SEC  LBM


LOADING - 1            SYMMETRY JOINT LOAD

/-ELEMENT-//-------------------------------------------------------------------------------------------------------------------/

10      NX-3.98041E-01 NY-5.56518E-01 NXY 3.42163E-01 MX 1.47880E-02 MY-2.80022E-03 MXY-2.59152E-03 VX-7.39692E-03 VY-1.88098E-03
11      NX-2.12409E-02 NY-3.02982E-01 NXY 1.62566E-01 MX 5.44732E-03 MY-3.45250E-03 MXY-3.36181E-03 VX 1.34992E-02 VY 8.44484E-04
12      NX-4.65369E-03 NY-1.49971E-01 NXY 9.96118E-02 MX 1.32126E-03 MY-6.97662E-03 MXY-1.34858E-03 VX 3.32837E-03 VY-7.21880E-05
13      NX-1.05613E-02 NY-4.73406E-02 NXY 5.31629E-02 MX 8.93150E-04 MY-7.67889E-03 MXY 5.34795E-05 VX 2.22698E-03 VY-2.07001E-03
14      NX-1.11908E-02 NY-3.09303E-03 NXY 5.55793E-03 MX 1.04942E-03 MY-7.02098E-03 MXY 9.18094E-04 VX 3.17983E-03 VY 9.55661E-04
15      NX-1.48386E-02 NY-6.45777E-03 NXY-1.27494E-02 MX 1.78954E-03 MY-6.41098E-03 MXY-9.62112E-04 VX 3.03405E-03 VY 1.65758E-04
16      NX-3.32344E-02 NY-7.47427E-02 NXY-6.68225E-02 MX 9.43132E-04 MY-7.16302E-03 MXY-3.74121E-04 VX 2.42003E-03 VY-9.06965E-04
17      NX-5.79017E-02 NY-1.91458E-01 NXY-1.21471E-01 MX 9.87642E-04 MY-6.58505E-03 MXY 5.92723E-04 VX 1.13019E-03 VY-2.52468E-03
18      NX-1.15949E-01 NY-3.48327E-01 NXY-1.95802E-01 MX 3.02422E-03 MY-4.18612E-03 MXY 1.71078E-03 VX-2.10177E-04 VY-3.83897E-03
19      NX-3.02628E-01 NY-5.41978E-01 NXY-3.38593E-01 MX 1.89245E-02 MY 2.56488E-03 MXY 1.57170E-03 VX-4.19925E-02 VY 6.66366E-03
20      NX-1.17834E-01 NY-4.29633E-02 NXY 1.21920E-01 MX 2.51859E-03 MY-3.28853E-03 MXY 1.92693E-03 VX-9.78403E-03 VY 6.54014E-03
21      NX-1.22841E-01 NY-1.56445E-01 NXY 2.08279E-01 MX 1.47851E-03 MY-5.25908E-03 MXY-4.62415E-04 VX-4.07933E-03 VY 3.84336E-03
22      NX-7.41152E-02 NY-1.21849E-01 NXY 1.70792E-01 MX 9.34786E-04 MY-7.83014E-03 MXY-1.09276E-03 VX-4.19674E-03 VY 1.73984E-03
23      NX-7.47996E-02 NY-7.03502E-02 NXY 1.12172E-01 MX 1.54579E-03 MY-8.84636E-03 MXY-4.98810E-04 VX-1.42512E-03 VY-1.70594E-03
24      NX-6.89843E-02 NY-2.84211E-02 NXY 3.48933E-02 MX 3.38183E-03 MY-5.65000E-03 MXY 4.15002E-04 VX-3.79914E-04 VY-5.73517E-03
25      NX-7.50809E-02 NY-3.71278E-02 NXY-5.36262E-02 MX 3.16521E-03 MY-5.82577E-03 MXY-2.79547E-04 VX 2.17243E-03 VY 4.51626E-03
26      NX-8.98929E-02 NY-8.29293E-02 NXY-1.29700E-01 MX 1.32515E-03 MY-8.27590E-03 MXY 3.32325E-04 VX 1.55742E-03 VY-4.12817E-04
27      NX-9.32570E-02 NY-1.26831E-01 NXY-1.80445E-01 MX 1.25227E-04 MY-7.78407E-03 MXY 9.38596E-04 VX-1.20424E-03 VY-1.97882E-03
28      NX-1.11856E-01 NY-1.51895E-01 NXY-2.00238E-01 MX 6.63741E-04 MY-5.42043E-03 MXY 4.30423E-04 VX-5.49610E-03 VY-1.35148E-03
29      NX-1.41581E-01 NY-1.24542E-01 NXY-1.55847E-01 MX 3.35643E-03 MY-1.52106E-03 MXY-1.57177E-03 VX-1.30273E-02 VY-2.23416E-03
30      NX 2.35311E-02 NY-5.26102E-03 NXY 7.43182E-02 MX-5.34761E-03 MY-2.33138E-03 MXY 1.47660E-03 VX-9.74056E-03 VY 7.33713E-03
31      NX-6.87720E-02 NY-5.78134E-02 NXY 1.59718E-01 MX-4.62006E-03 MY-5.20800E-03 MXY-9.06055E-04 VX-9.02646E-03 VY 6.41767E-03
32      NX-1.08299E-01 NY-9.86473E-02 NXY 1.78340E-01 MX-3.45933E-03 MY-8.23169E-03 MXY-2.53443E-03 VX-9.68689E-03 VY 5.71270E-03
33      NX-1.43570E-01 NY-9.25063E-02 NXY 1.46307E-01 MX-1.04714E-03 MY-1.06806E-02 MXY-2.62410E-03 VX-7.91576E-03 VY 1.65124E-03
34      NX-1.64642E-01 NY-5.44650E-02 NXY 6.66971E-02 MX 1.83775E-03 MY-7.91749E-03 MXY 4.12991E-04 VX-2.87486E-03 VY-1.44913E-02
35      NX-1.70108E-01 NY-7.76054E-02 NXY-8.61641E-02 MX 3.67394E-03 MY-6.28281E-03 MXY 4.38070E-04 VX 4.75566E-03 VY 7.59178E-03
36      NX-1.45845E-01 NY-9.99665E-02 NXY-1.59157E-01 MX-1.36029E-03 MY-1.05233E-02 MXY 2.40353E-03 VX-4.95873E-04 VY-2.35257E-03
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PAGE - 22

/-ELEMENT-//----------/

37	NX	-1.08615E-01	NY	-1.01037E-01	NXY	-1.84987E-01	MX	-4.19134E-03	MY	-8.65984E-03	MXY	2.43697E-03	VX	-4.25194E-03	VY	-3.01347E-03
38	NX	-7.24906E-02	NY	-8.07386E-02	NXY	-1.70749E-01	MX	-4.97310E-03	MY	-5.22208E-03	MXY	9.32315E-04	VX	-5.98861E-03	VY	-1.86568E-03
39	NX	-1.14306E-02	NY	-4.42603E-02	NXY	-9.60901E-02	MX	-5.16846E-03	MY	-1.97729E-03	MXY	-9.17399E-04	VX	-6.33310E-03	VY	-1.10265E-03
40	NX	1.20640E-01	NY	-4.61146E-03	NXY	5.09433E-02	MX	-1.18877E-02	MY	-1.80287E-03	MXY	4.37975E-04	VX	-7.19404E-03	VY	5.32528E-03
41	NX	-1.13988E-02	NY	-5.35869E-02	NXY	1.09689E-01	MX	-1.18598E-02	MY	-4.66463E-03	MXY	-1.75947E-03	VX	-8.94909E-03	VY	6.75676E-03
42	NX	-9.41963E-02	NY	-1.20345E-01	NXY	1.42717E-01	MX	-1.14690E-02	MY	-8.04367E-03	MXY	-4.71515E-03	VX	-1.37231E-02	VY	9.35628E-03
43	NX	-1.81814E-01	NY	-1.69851E-01	NXY	1.53068E-01	MX	-8.71957E-03	MY	-1.19865E-02	MXY	-7.40134E-03	VX	-2.05527E-02	VY	9.80248E-03
44	NX	-2.82795E-01	NY	-1.54838E-01	NXY	1.10568E-01	MX	-4.92293E-03	MY	-1.63964E-02	MXY	-2.51731E-03	VX	-1.59669E-02	VY	-1.99710E-02
45	NX	-2.94965E-01	NY	-1.96771E-01	NXY	-1.26796E-01	MX	-2.80017E-04	MY	-1.09532E-02	MXY	3.53341E-03	VX	8.27081E-03	VY	3.40956E-03
46	NX	-1.87697E-01	NY	-1.72356E-01	NXY	-1.62882E-01	MX	-1.10608E-02	MY	-1.42020E-02	MXY	6.47362E-03	VX	-1.18343E-02	VY	-7.35426E-03
47	NX	-1.04774E-01	NY	-1.25087E-01	NXY	-1.56818E-01	MX	-1.22345E-02	MY	-8.81037E-03	MXY	4.22651E-03	VX	-9.87639E-03	VY	-2.64698E-03
48	NX	-2.56228E-02	NY	-6.97061E-02	NXY	-1.27541E-01	MX	-1.15206E-02	MY	-4.58295E-03	MXY	1.73072E-03	VX	-6.73617E-03	VY	-9.87515E-04
49	NX	9.23817E-02	NY	-2.42785E-02	NXY	-6.39109E-02	MX	-1.11737E-02	MY	-1.65238E-03	MXY	-5.57685E-05	VX	-4.45449E-03	VY	-6.29836E-04
50	NX	1.73029E-01	NY	-1.10070E-02	NXY	1.93779E-02	MX	-1.56626E-02	MY	-1.60524E-03	MXY	2.28208E-04	VX	-1.52519E-03	VY	2.54837E-03
51	NX	2.45519E-02	NY	-7.27231E-02	NXY	3.88501E-02	MX	-1.78844E-02	MY	-4.51062E-03	MXY	-4.22635E-04	VX	3.11708E-04	VY	3.68085E-03
52	NX	-6.72522E-02	NY	-1.66866E-01	NXY	5.85388E-02	MX	-2.38905E-02	MY	-8.98173E-03	MXY	-1.96697E-03	VX	2.98713E-04	VY	4.77746E-03
53	NX	-1.66462E-01	NY	-2.78745E-01	NXY	8.46040E-02	MX	-3.39457E-02	MY	-1.53066E-02	MXY	-6.69907E-03	VX	-1.91409E-02	VY	8.09193E-03
54	NX	-3.99793E-01	NY	-3.92160E-01	NXY	1.22164E-01	MX	-3.71420E-02	MY	-2.78223E-02	MXY	-1.83302E-02	VX	-8.80391E-02	VY	3.83479E-02
55	NX	-4.26418E-01	NY	-4.22567E-01	NXY	-1.32757E-01	MX	-6.55376E-02	MY	-5.05455E-02	MXY	1.63413E-02	VX	-1.20278E-01	VY	-4.93820E-02
56	NX	-1.96581E-01	NY	-2.84720E-01	NXY	-1.02967E-01	MX	-3.29072E-02	MY	-1.76340E-02	MXY	7.83472E-03	VX	-3.82048E-02	VY	-5.70982E-03
57	NX	-8.48153E-02	NY	-1.71414E-01	NXY	-7.84920E-02	MX	-2.17274E-02	MY	-8.17626E-03	MXY	3.13223E-03	VX	-1.24099E-02	VY	-2.94292E-05
58	NX	1.30899E-02	NY	-7.92896E-02	NXY	-5.69873E-02	MX	-1.69449E-02	MY	-4.10284E-03	MXY	1.26946E-03	VX	-5.61020E-03	VY	-6.91384E-04
59	NX	1.60410E-01	NY	-1.80871E-02	NXY	-2.64966E-02	MX	-1.51160E-02	MY	-1.50095E-03	MXY	2.81641E-04	VX	-2.51727E-03	VY	-7.75181E-04
60	NX	1.60410E-01	NY	-1.80871E-02	NXY	-2.64966E-02	MX	-1.51160E-02	MY	-1.50094E-03	MXY	2.81645E-04	VX	2.51728E-03	VY	7.75162E-04
61	NX	1.30899E-02	NY	-7.92895E-02	NXY	-5.69873E-02	MX	-1.69449E-02	MY	-4.10280E-03	MXY	1.26946E-03	VX	5.61021E-03	VY	6.91345E-04
62	NX	-8.48154E-02	NY	-1.71414E-01	NXY	-7.84919E-02	MX	-2.17274E-02	MY	-8.17621E-03	MXY	3.13224E-03	VX	1.24099E-02	VY	2.94292E-05
63	NX	-1.96581E-01	NY	-2.84720E-01	NXY	-1.02967E-01	MX	-3.29073E-02	MY	-1.76341E-02	MXY	7.83473E-03	VX	3.82048E-02	VY	5.71016E-03
64	NX	-4.26418E-01	NY	-4.22567E-01	NXY	-1.32757E-01	MX	-6.55376E-02	MY	-5.05456E-02	MXY	1.63412E-02	VX	1.20278E-01	VY	4.93816E-02
65	NX	-3.99793E-01	NY	-3.92160E-01	NXY	1.22163E-01	MX	-3.71419E-02	MY	-2.78222E-02	MXY	-1.83302E-02	VX	8.80391E-02	VY	-3.83482E-02
66	NX	-1.66462E-01	NY	-2.78745E-01	NXY	8.46042E-02	MX	-3.39457E-02	MY	-1.53065E-02	MXY	-6.69905E-03	VX	1.91408E-02	VY	-8.09163E-03
67	NX	-6.72521E-02	NY	-1.66866E-01	NXY	5.85389E-02	MX	-2.38905E-02	MY	-8.98177E-03	MXY	-1.96697E-03	VX	-2.98679E-04	VY	-4.77746E-03
68	NX	2.45519E-02	NY	-7.27232E-02	NXY	3.88501E-02	MX	-1.78844E-02	MY	-4.51065E-03	MXY	-4.22632E-04	VX	-3.11672E-04	VY	-3.68086E-03
69	NX	1.73029E-01	NY	-1.10069E-02	NXY	1.93779E-02	MX	-1.56626E-02	MY	-1.60525E-03	MXY	2.28212E-04	VX	1.52519E-03	VY	-2.54839E-03
70	NX	9.23818E-02	NY	-2.42785E-02	NXY	-6.39109E-02	MX	-1.11737E-02	MY	-1.65238E-03	MXY	-5.57570E-05	VX	4.45450E-03	VY	6.29818E-04
71	NX	-2.56228E-02	NY	-6.97061E-02	NXY	-1.27541E-01	MX	-1.15206E-02	MY	-4.58292E-03	MXY	1.73073E-03	VX	6.73617E-03	VY	9.87481E-04
72	NX	-1.04774E-01	NY	-1.25087E-01	NXY	-1.56817E-01	MX	-1.22345E-02	MY	-8.81033E-03	MXY	4.22653E-03	VX	9.87640E-03	VY	2.64699E-03
73	NX	-1.87696E-01	NY	-1.72355E-01	NXY	-1.62882E-01	MX	-1.10608E-02	MY	-1.42020E-02	MXY	6.47363E-03	VX	1.18344E-02	VY	7.35451E-03
74	NX	-2.94965E-01	NY	-1.96771E-01	NXY	-1.26797E-01	MX	-2.80041E-04	MY	-1.09533E-02	MXY	3.53337E-03	VX	-8.27084E-03	VY	-3.40971E-03
75	NX	-2.82796E-01	NY	-1.54839E-01	NXY	1.10568E-01	MX	-4.92290E-03	MY	-1.63963E-02	MXY	-2.51735E-03	VX	1.59670E-02	VY	1.99708E-02
76	NX	-1.81814E-01	NY	-1.69851E-01	NXY	1.53068E-01	MX	-8.71954E-03	MY	-1.19864E-02	MXY	-7.40132E-03	VX	2.05525E-02	VY	-9.80231E-03
77	NX	-9.41963E-02	NY	-1.20345E-01	NXY	1.42717E-01	MX	-1.14690E-02	MY	-8.04370E-03	MXY	-4.71514E-03	VX	1.37231E-02	VY	-9.35626E-03
78	NX	-1.13987E-02	NY	-5.35869E-02	NXY	1.09689E-01	MX	-1.18598E-02	MY	-4.66466E-03	MXY	-1.75946E-03	VX	8.94914E-03	VY	-6.75678E-03
79	NX	1.20640E-01	NY	-4.61146E-03	NXY	5.09433E-02	MX	-1.18877E-02	MY	-1.80288E-03	MXY	4.37986E-04	VX	7.19403E-03	VY	-5.32529E-03
80	NX	-1.14305E-02	NY	-4.42603E-02	NXY	-9.60901E-02	MX	-5.16845E-03	MY	-1.97728E-03	MXY	-9.17383E-04	VX	6.33310E-03	VY	1.10264E-03
81	NX	-7.24906E-02	NY	-8.07386E-02	NXY	-1.70749E-01	MX	-4.97309E-03	MY	-5.22205E-03	MXY	9.32334E-04	VX	5.98860E-03	VY	1.86564E-03
82	NX	-1.08615E-01	NY	-1.01037E-01	NXY	-1.84987E-01	MX	-4.19133E-03	MY	-8.65979E-03	MXY	2.43699E-03	VX	4.25194E-03	VY	3.01349E-03
83	NX	-1.45845E-01	NY	-9.99665E-02	NXY	-1.59157E-01	MX	-1.36030E-03	MY	-1.05234E-02	MXY	2.40353E-03	VX	4.95900E-04	VY	2.35273E-03

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84      NX-1.70108E-01 NY-7.76055E-02 NXY-8.61643E-02 MX 3.67393E-03 MY-6.28286E-03 MXY 4.38037E-04 VX-4.75567E-03 VY-7.59183E-03
85      NX-1.64642E-01 NY-5.44650E-02 NXY 6.66969E-02 MX 1.83777E-03 MY-7.91744E-03 MXY 4.12957E-04 VX 2.87488E-03 VY 1.44912E-02
86      NX-1.43570E-01 NY-9.25062E-02 NXY 1.46307E-01 MX-1.04713E-03 MY-1.06805E-02 MXY-2.62409E-03 VX 7.91569E-03 VY-1.65115E-03
87      NX-1.08299E-01 NY-9.86474E-02 NXY 1.78340E-01 MX-3.45934E-03 MY-8.23173E-03 MXY-2.53441E-03 VX 9.68690E-03 VY-5.71270E-03
88      NX-6.87720E-02 NY-5.78134E-02 NXY 1.59718E-01 MX-4.62007E-03 MY-5.20803E-03 MXY-9.06038E-04 VX 9.02651E-03 VY-6.41769E-03
89      NX 2.35311E-02 NY-5.26102E-03 NXY 7.43182E-02 MX-5.34762E-03 MY-2.33139E-03 MXY 1.47661E-03 VX 9.74055E-03 VY-7.33714E-03
90      NX-1.41581E-01 NY-1.24542E-01 NXY-1.55847E-01 MX 3.35643E-03 MY-1.52107E-03 MXY-1.57176E-03 VX 1.30272E-02 VY 2.23416E-03
91      NX-1.11856E-01 NY-1.51895E-01 NXY-2.00238E-01 MX 6.63746E-04 MY-5.42041E-03 MXY 4.30447E-04 VX 5.49608E-03 VY 1.35142E-03
92      NX-9.32570E-02 NY-1.26831E-01 NXY-1.80445E-01 MX 1.25248E-04 MY-7.78401E-03 MXY 9.38609E-04 VX 1.20424E-03 VY 1.97883E-03
93      NX-8.98929E-02 NY-8.29293E-02 NXY-1.29700E-01 MX 1.32516E-03 MY-8.27589E-03 MXY 3.32319E-04 VX-1.55741E-03 VY 4.12953E-04
94      NX-7.50809E-02 NY-3.71279E-02 NXY-5.36262E-02 MX 3.16520E-03 MY-5.82580E-03 MXY-2.79572E-04 VX-2.17244E-03 VY-4.51627E-03
95      NX-6.89843E-02 NY-2.84211E-02 NXY 3.48932E-02 MX 3.38183E-03 MY-5.64998E-03 MXY 4.14976E-04 VX 3.79934E-04 VY 5.73510E-03
96      NX-7.47996E-02 NY-7.03501E-02 NXY 1.12172E-01 MX 1.54579E-03 MY-8.84637E-03 MXY-4.98813E-04 VX 1.42508E-03 VY 1.70601E-03
97      NX-7.41152E-02 NY-1.21849E-01 NXY 1.70792E-01 MX 9.34772E-04 MY-7.83019E-03 MXY-1.09275E-03 VX 4.19675E-03 VY-1.73986E-03
98      NX-1.22841E-01 NY-1.56445E-01 NXY 2.08279E-01 MX 1.47850E-03 MY-5.25911E-03 MXY-4.62393E-04 VX 4.07938E-03 VY-3.84341E-03
99      NX-1.17834E-01 NY-4.29633E-02 NXY 1.21920E-01 MX 2.51859E-03 MY-3.28853E-03 MXY 1.92694E-03 VX 9.78401E-03 VY-6.54013E-03
100     NX-3.02628E-01 NY-5.41978E-01 NXY-3.38593E-01 MX 1.89245E-02 MY 2.56487E-03 MXY 1.57171E-03 VX 4.19925E-02 VY-6.66362E-03
101     NX-1.15949E-01 NY-3.48327E-01 NXY-1.95802E-01 MX 3.02422E-03 MY-4.18610E-03 MXY 1.71081E-03 VX 2.10163E-04 VY 3.83884E-03
102     NX-5.79018E-02 NY-1.91459E-01 NXY-1.21471E-01 MX 9.87659E-04 MY-6.58497E-03 MXY 5.92737E-04 VX-1.13021E-03 VY 2.52469E-03
103     NX-3.32344E-02 NY-7.47428E-02 NXY-6.68225E-02 MX 9.43141E-04 MY-7.16297E-03 MXY-3.74127E-04 VX-2.42005E-03 VY 9.07102E-04
104     NX-1.48386E-02 NY-6.45781E-03 NXY-1.27494E-02 MX 1.78954E-03 MY-6.41099E-03 MXY-9.62139E-04 VX-3.03405E-03 VY-1.65736E-04
105     NX-1.11907E-02 NY-3.09299E-03 NXY 5.55797E-03 MX 1.04943E-03 MY-7.02098E-03 MXY 9.18069E-04 VX-3.17982E-03 VY-9.55679E-04
106     NX-1.05613E-02 NY-4.73405E-02 NXY 5.31628E-02 MX 8.93145E-04 MY-7.67892E-03 MXY 5.34770E-05 VX-2.22697E-03 VY 2.07006E-03
107     NX-4.65367E-03 NY-1.49971E-01 NXY 9.96117E-02 MX 1.32124E-03 MY-6.97669E-03 MXY-1.34857E-03 VX-3.32835E-03 VY 7.21495E-05
108     NX-2.12409E-02 NY-3.02982E-01 NXY 1.62566E-01 MX 5.44732E-03 MY-3.45252E-03 MXY-3.36179E-03 VX-1.34992E-02 VY-8.44593E-04
109     NX-3.98041E-01 NY-5.56518E-01 NXY 3.42163E-01 MX 1.47880E-02 MY-2.80020E-03 MXY-2.59151E-03 VX 7.39689E-03 VY 1.88105E-03

   LOADING - 2          SIDE WIND LOAD

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10      NX 1.08274E+00 NY 1.97909E+00 NXY-1.05613E+00 MX 2.06675E-01 MY-7.05528E-02 MXY 5.87276E-02 VX-1.75093E-01 VY 2.26723E-02
11      NX 5.67154E-02 NY 1.19426E+00 NXY-4.71217E-01 MX 6.11069E-02 MY-8.50986E-02 MXY 2.98117E-02 VX 1.82510E-01 VY 2.35177E-02
12      NX 4.55447E-03 NY 7.06539E-01 NXY-2.55389E-01 MX-3.92248E-03 MY-1.09251E-01 MXY 4.19636E-02 VX 2.72743E-02 VY-1.88433E-02
13      NX-6.09524E-04 NY 3.35806E-01 NXY-1.51436E-01 MX-9.59620E-03 MY-6.42871E-02 MXY 3.90295E-02 VX 4.40785E-03 VY-6.31180E-02
14      NX-1.78794E-02 NY 3.01921E-02 NXY-1.04623E-01 MX 3.91503E-03 MY 2.33754E-02 MXY 3.25202E-02 VX 1.28917E-02 VY-8.70485E-02
15      NX-3.71106E-02 NY-2.00445E-01 NXY-1.33249E-01 MX 1.20109E-02 MY 8.02503E-02 MXY 1.52340E-02 VX 1.61158E-02 VY-2.23588E-03
16      NX-5.07408E-02 NY-3.56648E-01 NXY-1.48271E-01 MX 7.34530E-03 MY 7.61719E-02 MXY 1.30651E-02 VX 1.05046E-02 VY 1.09693E-02
17      NX-9.41311E-02 NY-5.37732E-01 NXY-1.99817E-01 MX 1.95417E-03 MY 5.89760E-02 MXY 1.41534E-02 VX 7.49937E-03 VY 1.99052E-02
18      NX-1.79405E-01 NY-7.63633E-01 NXY-3.14833E-01 MX-9.20524E-03 MY 3.48814E-02 MXY 1.39240E-02 VX 6.18208E-03 VY 2.62084E-02
19      NX-3.15310E-01 NY-1.06088E+00 NXY-5.31404E-01 MX-7.66065E-02 MY-6.26742E-03 MXY 1.72460E-02 VX 1.77083E-01 VY-1.45912E-02
20      NX 2.67408E-01 NY 1.37710E-01 NXY-2.12812E-01 MX-1.73380E-03 MY-7.29275E-02 MXY 1.19813E-01 VX-1.63222E-01 VY 1.26567E-01
21      NX 3.95588E-01 NY 4.46331E-01 NXY-4.54204E-01 MX-1.36972E-02 MY-1.03707E-01 MXY 8.00187E-02 VX-5.12113E-02 VY 4.39944E-02
22      NX 1.85660E-01 NY 3.12021E-01 NXY-3.58172E-01 MX-2.28645E-02 MY-1.04885E-01 MXY 6.08995E-02 VX-3.82412E-02 VY-1.55065E-02
23      NX 8.50199E-02 NY 1.16894E-01 NXY-2.71119E-01 MX-1.55864E-02 MY-5.42028E-02 MXY 4.71216E-02 VX-7.51799E-03 VY-6.05908E-02
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PAGE - 24

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24	NX	4.57062E-03	NY	-9.01760E-02	NXY	-2.23252E-01	MX	9.16825E-03	MY	4.19735E-02	MXY	3.55223E-02	VX	3.24535E-03	VY	-1.01357E-01
25	NX	-4.78779E-02	NY	-2.57958E-01	NXY	-2.04712E-01	MX	2.39865E-02	MY	9.66545E-02	MXY	1.98414E-02	VX	7.61821E-03	VY	3.24876E-02
26	NX	-6.39378E-02	NY	-2.93809E-01	NXY	-2.22219E-01	MX	1.90444E-02	MY	8.15070E-02	MXY	1.31109E-02	VX	1.26160E-02	VY	2.15080E-02
27	NX	-1.09517E-01	NY	-3.20202E-01	NXY	-2.44473E-01	MX	1.31714E-02	MY	6.13559E-02	MXY	1.37051E-02	VX	1.34132E-02	VY	1.81328E-02
28	NX	-1.52832E-01	NY	-3.10442E-01	NXY	-2.51522E-01	MX	4.90352E-03	MY	3.85465E-02	MXY	1.79841E-02	VX	2.29084E-02	VY	1.51322E-02
29	NX	-1.15258E-01	NY	-2.09249E-01	NXY	-1.77588E-01	MX	-7.72612E-03	MY	1.17187E-02	MXY	2.71438E-02	VX	5.03465E-02	VY	1.88614E-02
30	NX	1.90865E-02	NY	-2.21649E-02	NXY	-4.25014E-02	MX	-9.87555E-02	MY	-5.55885E-02	MXY	1.00688E-01	VX	-1.26361E-01	VY	1.25030E-01
31	NX	2.56005E-01	NY	-1.82483E-02	NXY	-2.25856E-01	MX	-7.85562E-02	MY	-9.84115E-02	MXY	7.60739E-02	VX	-8.19225E-02	VY	5.53598E-02
32	NX	2.43816E-01	NY	1.31576E-03	NXY	-2.82665E-01	MX	-5.87528E-02	MY	-9.60720E-02	MXY	5.96049E-02	VX	-5.31511E-02	VY	1.47153E-03
33	NX	1.46757E-01	NY	-6.87797E-02	NXY	-2.59030E-01	MX	-2.97215E-02	MY	-4.35377E-02	MXY	4.59769E-02	VX	-2.75759E-02	VY	-5.55591E-02
34	NX	4.50638E-02	NY	-1.76629E-01	NXY	-2.29059E-01	MX	1.10547E-02	MY	6.06255E-02	MXY	3.34499E-02	VX	-1.14305E-02	VY	-1.09895E-01
35	NX	-3.27517E-02	NY	-2.71012E-01	NXY	-2.00783E-01	MX	3.53135E-02	MY	1.15037E-01	MXY	1.89656E-02	VX	-2.18418E-05	VY	4.77772E-02
36	NX	-6.14412E-02	NY	-2.40864E-01	NXY	-1.99578E-01	MX	3.13780E-02	MY	8.81844E-02	MXY	1.19900E-02	VX	7.35019E-03	VY	3.07923E-02
37	NX	-9.01597E-02	NY	-1.96413E-01	NXY	-1.95041E-01	MX	2.71970E-02	MY	6.27850E-02	MXY	1.19858E-02	VX	1.02068E-02	VY	2.36434E-02
38	NX	-8.79715E-02	NY	-1.34406E-01	NXY	-1.61703E-01	MX	2.41896E-02	MY	3.75921E-02	MXY	1.57624E-02	VX	1.32836E-02	VY	2.11098E-02
39	NX	1.04206E-02	NY	-5.42901E-02	NXY	-6.99561E-02	MX	2.47619E-02	MY	1.36798E-02	MXY	2.12369E-02	VX	1.47511E-02	VY	1.80144E-02
40	NX	-7.73248E-02	NY	-5.40773E-02	NXY	-5.45598E-03	MX	-1.47381E-01	MY	-4.54627E-02	MXY	6.37599E-02	VX	-9.52439E-02	VY	1.03535E-01
41	NX	1.49205E-01	NY	-1.42557E-01	NXY	-9.91523E-02	MX	-1.16830E-01	MY	-9.05768E-02	MXY	5.18145E-02	VX	-7.36487E-02	VY	4.99967E-02
42	NX	2.09580E-01	NY	-1.64542E-01	NXY	-1.57310E-01	MX	-8.22641E-02	MY	-8.74528E-02	MXY	4.18371E-02	VX	-5.31535E-02	VY	-3.62497E-03
43	NX	1.63898E-01	NY	-1.89232E-01	NXY	-1.70108E-01	MX	-4.00327E-02	MY	-3.34835E-02	MXY	3.30239E-02	VX	-3.48231E-02	VY	-6.14472E-02
44	NX	7.38273E-02	NY	-2.37497E-01	NXY	-1.60357E-01	MX	1.19089E-02	MY	7.62734E-02	MXY	2.42669E-02	VX	-1.92643E-02	VY	-1.20558E-01
45	NX	-1.24088E-02	NY	-2.85241E-01	NXY	-1.39653E-01	MX	4.39576E-02	MY	1.29877E-01	MXY	1.37705E-02	VX	-6.43653E-03	VY	5.59692E-02
46	NX	-4.75889E-02	NY	-2.13369E-01	NXY	-1.32447E-01	MX	4.12581E-02	MY	9.41024E-02	MXY	8.45483E-03	VX	3.69429E-04	VY	3.82492E-02
47	NX	-6.32698E-02	NY	-1.39954E-01	NXY	-1.20952E-01	MX	3.88104E-02	MY	6.40597E-02	MXY	7.92090E-03	VX	2.70010E-03	VY	2.94606E-02
48	NX	-3.24404E-02	NY	-6.99437E-02	NXY	-8.99884E-02	MX	3.84204E-02	MY	3.70344E-02	MXY	9.87618E-03	VX	2.53491E-03	VY	2.53536E-02
49	NX	8.53480E-02	NY	-1.62274E-02	NXY	-3.02372E-02	MX	4.15871E-02	MY	1.28700E-02	MXY	1.26781E-02	VX	1.04828E-04	VY	2.19296E-02
50	NX	-1.10620E-01	NY	-6.49040E-02	NXY	3.37319E-03	MX	-1.68952E-01	MY	-4.16133E-02	MXY	2.35906E-02	VX	-7.08385E-02	VY	8.94834E-02
51	NX	9.87848E-02	NY	-1.70718E-01	NXY	-2.20268E-02	MX	-1.34199E-01	MY	-8.59655E-02	MXY	1.97065E-02	VX	-5.83421E-02	VY	4.17027E-02
52	NX	1.78958E-01	NY	-2.19126E-01	NXY	-4.38415E-02	MX	-9.33620E-02	MY	-8.26358E-02	MXY	1.61502E-02	VX	-4.57837E-02	VY	-1.13348E-02
53	NX	1.59839E-01	NY	-2.43878E-01	NXY	-5.40182E-02	MX	-4.48182E-02	MY	-2.74832E-02	MXY	1.31739E-02	VX	-3.34783E-02	VY	-6.92242E-02
54	NX	8.63957E-02	NY	-2.70182E-01	NXY	-5.39908E-02	MX	1.33034E-02	MY	8.57623E-02	MXY	9.99993E-03	VX	-2.30926E-02	VY	-1.32233E-01
55	NX	5.98823E-04	NY	-2.98144E-01	NXY	-4.60888E-02	MX	4.90495E-02	MY	1.38728E-01	MXY	5.51606E-03	VX	-1.04629E-02	VY	5.70459E-02
56	NX	-3.71231E-02	NY	-2.05088E-01	NXY	-4.35446E-02	MX	4.69153E-02	MY	9.77261E-02	MXY	2.95040E-03	VX	-6.34152E-03	VY	4.11414E-02
57	NX	-4.67768E-02	NY	-1.18417E-01	NXY	-3.99872E-02	MX	4.52357E-02	MY	6.50051E-02	MXY	2.34096E-03	VX	-5.17460E-03	VY	3.28369E-02
58	NX	-2.86630E-03	NY	-4.73923E-02	NXY	-2.99129E-02	MX	4.56389E-02	MY	3.69928E-02	MXY	2.72528E-03	VX	-6.61857E-03	VY	2.85942E-02
59	NX	1.21634E-01	NY	-7.04207E-03	NXY	-9.87403E-03	MX	4.92657E-02	MY	1.25799E-02	MXY	3.46759E-03	VX	-9.52720E-03	VY	2.53278E-02
60	NX	-1.05381E-01	NY	-6.63691E-02	NXY	9.83692E-03	MX	-1.69791E-01	MY	-4.09171E-02	MXY	-1.69601E-02	VX	-4.79679E-02	VY	7.93600E-02
61	NX	9.81508E-02	NY	-1.61856E-01	NXY	4.20628E-02	MX	-1.34319E-01	MY	-8.49065E-02	MXY	-1.47070E-02	VX	-3.92110E-02	VY	3.31319E-02
62	NX	1.75266E-01	NY	-2.14695E-01	NXY	6.00310E-02	MX	-9.30429E-02	MY	-8.21195E-02	MXY	-1.21345E-02	VX	-3.26331E-02	VY	-1.93355E-02
63	NX	1.58497E-01	NY	-2.46948E-01	NXY	6.47082E-02	MX	-4.41969E-02	MY	-2.70986E-02	MXY	-9.17114E-03	VX	-2.64785E-02	VY	-7.75798E-02
64	NX	8.89857E-02	NY	-2.75564E-01	NXY	6.31827E-02	MX	1.44938E-02	MY	8.68894E-02	MXY	-6.13797E-03	VX	-2.25521E-02	VY	-1.43089E-01
65	NX	3.06778E-03	NY	-3.05960E-01	NXY	5.74247E-02	MX	4.98993E-02	MY	1.40086E-01	MXY	-3.85174E-03	VX	-1.19770E-02	VY	5.11002E-02
66	NX	-3.73490E-02	NY	-2.09736E-01	NXY	5.35069E-02	MX	4.72294E-02	MY	9.80819E-02	MXY	-3.21054E-03	VX	-1.16586E-02	VY	3.94834E-02
67	NX	-4.98937E-02	NY	-1.17513E-01	NXY	4.45367E-02	MX	4.53287E-02	MY	6.51500E-02	MXY	-3.64488E-03	VX	-1.21142E-02	VY	3.38658E-02
68	NX	-5.41794E-03	NY	-4.26067E-02	NXY	2.71538E-02	MX	4.56070E-02	MY	3.72409E-02	MXY	-4.67137E-03	VX	-1.47598E-02	VY	3.10560E-02
69	NX	1.22898E-01	NY	-6.29385E-03	NXY	5.28330E-03	MX	4.91275E-02	MY	1.27337E-02	MXY	-5.91914E-03	VX	-1.82037E-02	VY	2.85677E-02
70	NX	-6.45877E-02	NY	-5.09296E-02	NXY	2.74498E-02	MX	-1.49470E-01	MY	-4.27442E-02	MXY	-5.65168E-02	VX	-1.81244E-02	VY	6.80491E-02

/-ELEMENT-//																	
71	NX	1.41119E-01	NY	-1.13161E-01	NXY	1.16285E-01	MX	-1.17259E-01	MY	-8.74268E-02	MXY	-4.75280E-02	VX	-1.20723E-02	VY	2.40804E-02
72	NX	1.97832E-01	NY	-1.57785E-01	NXY	1.62858E-01	MX	-8.18243E-02	MY	-8.61580E-02	MXY	-3.84206E-02	VX	-1.30204E-02	VY	-2.79715E-02
73	NX	1.65133E-01	NY	-2.03659E-01	NXY	1.74917E-01	MX	-3.89871E-02	MY	-3.26540E-02	MXY	-2.98397E-02	VX	-1.50862E-02	VY	-8.50059E-02
74	NX	8.58597E-02	NY	-2.54850E-01	NXY	1.70462E-01	MX	1.46586E-02	MY	7.90693E-02	MXY	-2.09463E-02	VX	-1.83542E-02	VY	-1.51246E-01
75	NX	-1.97686E-03	NY	-3.09006E-01	NXY	1.50610E-01	MX	4.58900E-02	MY	1.33524E-01	MXY	-1.21210E-02	VX	-1.12779E-02	VY	3.89668E-02
76	NX	-4.50606E-02	NY	-2.29871E-01	NXY	1.46808E-01	MX	4.16932E-02	MY	9.50239E-02	MXY	-8.53296E-03	VX	-1.51939E-02	VY	3.39505E-02
77	NX	-7.29408E-02	NY	-1.41772E-01	NXY	1.32866E-01	MX	3.88010E-02	MY	6.44908E-02	MXY	-9.04871E-03	VX	-1.77073E-02	VY	3.30699E-02
78	NX	-4.36842E-02	NY	-5.52311E-02	NXY	9.04452E-02	MX	3.82498E-02	MY	3.78485E-02	MXY	-1.16590E-02	VX	-2.19828E-02	VY	3.27868E-02
79	NX	8.71308E-02	NY	-1.02710E-02	NXY	2.12573E-02	MX	4.12708E-02	MY	1.35320E-02	MXY	-1.53520E-02	VX	-2.69765E-02	VY	3.27767E-02
80	NX	2.37679E-02	NY	2.04583E-02	NXY	8.60553E-02	MX	-9.86687E-02	MY	-4.73421E-02	MXY	-9.23882E-02	VX	3.92144E-02	VY	5.27501E-02
81	NX	2.18974E-01	NY	2.37978E-02	NXY	2.24519E-01	MX	-7.99755E-02	MY	-9.38540E-02	MXY	-7.33060E-02	VX	2.98371E-02	VY	1.20752E-02
82	NX	2.31217E-01	NY	-1.56094E-02	NXY	2.66489E-01	MX	-6.04990E-02	MY	-9.43623E-02	MXY	-5.72334E-02	VX	1.22261E-02	VY	-3.84087E-02
83	NX	1.70787E-01	NY	-9.73278E-02	NXY	2.59834E-01	MX	-3.05092E-02	MY	-4.28655E-02	MXY	-4.47859E-02	VX	-1.20506E-03	VY	-8.98001E-02
84	NX	7.55993E-02	NY	-2.02309E-01	NXY	2.42298E-01	MX	1.29100E-02	MY	6.30776E-02	MXY	-3.17457E-02	VX	-1.18023E-02	VY	-1.54055E-01
85	NX	-8.36470E-03	NY	-3.04625E-01	NXY	2.11156E-01	MX	3.64676E-02	MY	1.19597E-01	MXY	-1.72317E-02	VX	-9.66783E-03	VY	2.14048E-02
86	NX	-4.45687E-02	NY	-2.69717E-01	NXY	2.17079E-01	MX	3.05661E-02	MY	8.93564E-02	MXY	-1.17251E-02	VX	-1.65495E-02	VY	2.57968E-02
87	NX	-1.01387E-01	NY	-2.18746E-01	NXY	2.20939E-01	MX	2.61577E-02	MY	6.36306E-02	MXY	-1.29123E-02	VX	-2.10153E-02	VY	3.09134E-02
88	NX	-1.19773E-01	NY	-1.18667E-01	NXY	1.76382E-01	MX	2.36026E-02	MY	3.89989E-02	MXY	-1.72563E-02	VX	-2.64355E-02	VY	3.33530E-02
89	NX	2.57285E-03	NY	-2.58115E-02	NXY	5.11330E-02	MX	2.51077E-02	MY	1.58601E-02	MXY	-2.43549E-02	VX	-3.61158E-02	VY	3.87118E-02
90	NX	1.94367E-01	NY	3.14005E-01	NXY	2.81402E-01	MX	1.63470E-02	MY	-4.14707E-02	MXY	-1.15844E-01	VX	1.91110E-01	VY	5.34270E-02
91	NX	3.06253E-01	NY	3.82344E-01	NXY	3.90327E-01	MX	-2.25003E-02	MY	-1.02799E-01	MXY	-8.05925E-02	VX	8.11272E-02	VY	-9.03383E-03
92	NX	2.40288E-01	NY	2.80087E-01	NXY	3.49661E-01	MX	-3.32663E-02	MY	-1.03605E-01	MXY	-6.25194E-02	VX	3.41448E-02	VY	-4.63623E-02
93	NX	1.53515E-01	NY	1.03914E-01	NXY	2.81825E-01	MX	-2.08763E-02	MY	-5.45990E-02	MXY	-5.05340E-02	VX	1.31602E-02	VY	-8.95607E-02
94	NX	5.42574E-02	NY	-1.02518E-01	NXY	2.37641E-01	MX	8.65098E-03	MY	4.12178E-02	MXY	-3.68329E-02	VX	-3.80744E-03	VY	-1.46279E-01
95	NX	-9.02157E-03	NY	-2.76616E-01	NXY	2.14195E-01	MX	2.21792E-02	MY	1.00203E-01	MXY	-1.79596E-02	VX	-7.53749E-03	VY	-1.97709E-03
96	NX	-1.99549E-02	NY	-3.19392E-01	NXY	2.30693E-01	MX	1.58435E-02	MY	8.28723E-02	MXY	-1.21698E-02	VX	-1.42856E-02	VY	1.56005E-02
97	NX	-7.85373E-02	NY	-3.61739E-01	NXY	2.65589E-01	MX	9.53864E-03	MY	6.28639E-02	MXY	-1.39004E-02	VX	-1.87903E-02	VY	2.39565E-02
98	NX	-2.16285E-01	NY	-3.71935E-01	NXY	3.07943E-01	MX	2.31788E-03	MY	3.94859E-02	MXY	-1.88176E-02	VX	-1.86475E-02	VY	2.95557E-02
99	NX	-1.76058E-01	NY	-1.14922E-01	NXY	1.52643E-01	MX	-2.86805E-03	MY	2.00435E-02	MXY	-2.94148E-02	VX	-4.44407E-02	VY	3.90450E-02
100	NX	5.12852E-01	NY	1.92895E+00	NXY	9.53874E-01	MX	2.88839E-01	MY	2.86378E-02	MXY	-7.44721E-02	VX	7.16887E-01	VY	-8.16820E-02
101	NX	3.27431E-01	NY	1.27205E+00	NXY	5.44354E-01	MX	2.53999E-02	MY	-9.44892E-02	MXY	-5.68844E-02	VX	4.38626E-02	VY	2.70191E-02
102	NX	1.72933E-01	NY	7.74500E-01	NXY	3.03429E-01	MX	-8.95872E-03	MY	-1.07278E-01	MXY	-5.42244E-02	VX	4.07663E-02	VY	-3.55567E-02
103	NX	8.36109E-02	NY	3.86378E-01	NXY	1.69519E-01	MX	-1.10433E-02	MY	-6.56425E-02	MXY	-4.53177E-02	VX	2.95230E-02	VY	-8.79964E-02
104	NX	2.24215E-02	NY	6.31675E-02	NXY	1.02788E-01	MX	4.92227E-03	MY	1.80995E-02	MXY	-3.47560E-02	VX	1.25778E-02	VY	-1.22636E-01
105	NX	6.49646E-03	NY	-1.78946E-01	NXY	1.36191E-01	MX	5.41651E-03	MY	7.93979E-02	MXY	-1.48068E-02	VX	-1.04019E-02	VY	-3.04629E-02
106	NX	1.90596E-02	NY	-3.49459E-01	NXY	1.43063E-01	MX	5.75820E-03	MY	7.95145E-02	MXY	-1.23291E-02	VX	-8.12103E-03	VY	1.13006E-02
107	NX	1.11818E-02	NY	-5.35465E-01	NXY	1.81432E-01	MX	3.29480E-04	MY	6.21503E-02	MXY	-1.20045E-02	VX	6.49682E-04	VY	2.22203E-02
108	NX	-2.94127E-02	NY	-7.73698E-01	NXY	2.91126E-01	MX	-1.85013E-02	MY	3.37901E-02	MXY	-8.00261E-03	VX	4.43324E-02	VY	2.25473E-02
109	NX	-6.77749E-01	NY	-1.18297E+00	NXY	6.33833E-01	MX	-5.65905E-02	MY	1.88827E-02	MXY	-1.43933E-02	VX	-4.35796E-02	VY	9.22003E-03

LOADING - 1 SYMMETRY JOINT LOAD

SUPPORT JOINT REACTION LOADS LOADING - 1

JOINT		FORCE			MOMENT		
		X FORCE	Y FORCE	Z FORCE	X MOMENT	Y MOMENT	Z MOMENT
1	GLOBAL	0.4490131	0.6057585	-0.2380723	-0.0000000	0.0292900	-0.0106607
11	GLOBAL	0.5212272	-0.6739120	-0.2619274	-0.0000000	0.0252440	0.0091881
111	GLOBAL	-0.5212272	0.6739120	-0.2619274	-0.0000000	-0.0252440	0.0091881
121	GLOBAL	-0.4490131	-0.6057585	-0.2380723	0.0000000	-0.0292900	-0.0106607

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - 1

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
1	GLOBAL	0.0	0.0	0.0	0.0000406	0.0	0.0
11	GLOBAL	0.0	0.0	0.0	-0.0000404	0.0	0.0
111	GLOBAL	0.0	0.0	0.0	0.0000404	0.0	0.0
121	GLOBAL	0.0	0.0	0.0	-0.0000406	0.0	0.0

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
6	GLOBAL	0.0000004	0.0000000	0.0000020	-0.0000001	-0.0000328	-0.0000004
116	GLOBAL	-0.0000004	-0.0000000	0.0000020	0.0000001	0.0000328	-0.0000004
2	GLOBAL	-0.0000001	-0.0000002	0.0000007	0.0000332	-0.0000226	0.0000083
3	GLOBAL	0.0000000	-0.0000002	0.0000013	0.0000268	-0.0000297	0.0000058
4	GLOBAL	0.0000001	-0.0000001	0.0000017	0.0000184	-0.0000330	0.0000027
5	GLOBAL	0.0000002	-0.0000000	0.0000019	0.0000094	-0.0000341	-0.0000006
7	GLOBAL	0.0000003	0.0000001	0.0000019	-0.0000097	-0.0000341	-0.0000014
8	GLOBAL	0.0000002	0.0000001	0.0000017	-0.0000186	-0.0000344	-0.0000026
9	GLOBAL	0.0000001	0.0000002	0.0000013	-0.0000265	-0.0000328	-0.0000032
10	GLOBAL	0.0000000	0.0000001	0.0000007	-0.0000319	-0.0000291	0.0000005
12	GLOBAL	-0.0000002	-0.0000005	0.0000006	0.0000453	-0.0000307	0.0000150
23	GLOBAL	-0.0000003	-0.0000006	0.0000013	0.0000403	-0.0000366	0.0000178
34	GLOBAL	-0.0000003	-0.0000007	0.0000021	0.0000364	-0.0000302	0.0000165
45	GLOBAL	-0.0000002	-0.0000007	0.0000026	0.0000347	-0.0000156	0.0000128

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT X DISP	Y DISP	Z DISP	ROTATION X ROT	Y ROT	Z ROT
56	GLOBAL	-0.0000000	-0.0000007	0.0000027	0.0000344	0.0000029	0.0000077
67	GLOBAL	0.0000001	-0.0000007	0.0000026	0.0000347	0.0000205	0.0000020
78	GLOBAL	0.0000002	-0.0000006	0.0000021	0.0000360	0.0000335	-0.0000031
89	GLOBAL	0.0000002	-0.0000006	0.0000014	0.0000391	0.0000394	-0.0000060
100	GLOBAL	0.0000001	-0.0000005	0.0000006	0.0000426	0.0000340	-0.0000049
17	GLOBAL	0.0000004	0.0000000	0.0000026	0.0000001	-0.0000378	-0.0000007
28	GLOBAL	0.0000004	0.0000000	0.0000033	0.0000002	-0.0000450	-0.0000001
39	GLOBAL	0.0000003	0.0000000	0.0000042	-0.0000001	-0.0000534	-0.0000017
50	GLOBAL	0.0000002	0.0000000	0.0000052	-0.0000020	-0.0000616	-0.0000087
61	GLOBAL	-0.0000000	-0.0000000	0.0000060	-0.0000000	0.0000000	0.0000198
72	GLOBAL	-0.0000002	-0.0000000	0.0000052	0.0000020	0.0000616	-0.0000087
83	GLOBAL	-0.0000003	-0.0000000	0.0000042	0.0000001	0.0000534	-0.0000017
94	GLOBAL	-0.0000004	-0.0000000	0.0000033	-0.0000002	0.0000450	-0.0000001
105	GLOBAL	-0.0000004	-0.0000000	0.0000026	-0.0000001	0.0000378	-0.0000007
22	GLOBAL	-0.0000001	0.0000005	0.0000006	-0.0000426	-0.0000341	-0.0000047
33	GLOBAL	-0.0000002	0.0000006	0.0000014	-0.0000391	-0.0000394	-0.0000061
44	GLOBAL	-0.0000002	0.0000006	0.0000021	-0.0000360	-0.0000335	-0.0000033
55	GLOBAL	-0.0000001	0.0000007	0.0000026	-0.0000347	-0.0000204	0.0000019
66	GLOBAL	0.0000000	0.0000007	0.0000027	-0.0000344	-0.0000029	0.0000077
77	GLOBAL	0.0000002	0.0000007	0.0000026	-0.0000347	0.0000154	0.0000133
88	GLOBAL	0.0000003	0.0000007	0.0000021	-0.0000364	0.0000298	0.0000174
99	GLOBAL	0.0000003	0.0000006	0.0000013	-0.0000403	0.0000362	0.0000191
110	GLOBAL	0.0000002	0.0000005	0.0000006	-0.0000453	0.0000303	0.0000163
112	GLOBAL	-0.0000000	-0.0000001	0.0000007	0.0000319	0.0000288	-0.0000002
113	GLOBAL	-0.0000001	-0.0000002	0.0000013	0.0000265	0.0000328	-0.0000030
114	GLOBAL	-0.0000002	-0.0000001	0.0000017	0.0000186	0.0000345	-0.0000024
115	GLOBAL	-0.0000003	-0.0000001	0.0000019	0.0000097	0.0000342	-0.0000014
117	GLOBAL	-0.0000002	0.0000000	0.0000019	-0.0000094	0.0000339	-0.0000002
118	GLOBAL	-0.0000001	0.0000001	0.0000017	-0.0000184	0.0000331	0.0000023
119	GLOBAL	-0.0000000	0.0000002	0.0000013	-0.0000268	0.0000296	0.0000059
120	GLOBAL	0.0000001	0.0000002	0.0000007	-0.0000332	0.0000223	0.0000090
13	GLOBAL	-0.0000000	-0.0000003	0.0000013	0.0000386	-0.0000305	0.0000162
24	GLOBAL	-0.0000001	-0.0000004	0.0000020	0.0000378	-0.0000341	0.0000167
35	GLOBAL	-0.0000001	-0.0000005	0.0000027	0.0000374	-0.0000293	0.0000152
46	GLOBAL	-0.0000001	-0.0000005	0.0000032	0.0000384	-0.0000159	0.0000119
57	GLOBAL	-0.0000000	-0.0000005	0.0000034	0.0000389	0.0000028	0.0000072
68	GLOBAL	0.0000000	-0.0000005	0.0000032	0.0000381	0.0000206	0.0000021
79	GLOBAL	0.0000000	-0.0000004	0.0000027	0.0000370	0.0000329	-0.0000023
90	GLOBAL	-0.0000000	-0.0000004	0.0000020	0.0000370	0.0000374	-0.0000049
101	GLOBAL	-0.0000000	-0.0000003	0.0000013	0.0000372	0.0000342	-0.0000045
14	GLOBAL	0.0000000	-0.0000002	0.0000019	0.0000301	-0.0000330	0.0000099
25	GLOBAL	0.0000000	-0.0000002	0.0000026	0.0000312	-0.0000356	0.0000132
36	GLOBAL	-0.0000000	-0.0000003	0.0000033	0.0000340	-0.0000321	0.0000139
47	GLOBAL	-0.0000000	-0.0000003	0.0000038	0.0000388	-0.0000189	0.0000119

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
58	GLOBAL	-0.0000000	-0.0000003	0.0000040	0.0000414	0.0000028	0.0000067
69	GLOBAL	-0.0000000	-0.0000003	0.0000038	0.0000386	0.0000232	0.0000011
80	GLOBAL	-0.0000000	-0.0000002	0.0000033	0.0000338	0.0000354	-0.0000026
91	GLOBAL	-0.0000001	-0.0000002	0.0000026	0.0000306	0.0000388	-0.0000040
102	GLOBAL	-0.0000001	-0.0000002	0.0000019	0.0000288	0.0000364	-0.0000038
15	GLOBAL	0.0000001	-0.0000001	0.0000023	0.0000195	-0.0000362	0.0000055
26	GLOBAL	0.0000001	-0.0000001	0.0000030	0.0000210	-0.0000398	0.0000088
37	GLOBAL	0.0000000	-0.0000001	0.0000038	0.0000255	-0.0000387	0.0000122
48	GLOBAL	0.0000000	-0.0000001	0.0000045	0.0000346	-0.0000276	0.0000108
59	GLOBAL	-0.0000000	-0.0000001	0.0000047	0.0000420	0.0000032	0.0000056
70	GLOBAL	-0.0000000	-0.0000001	0.0000044	0.0000344	0.0000304	0.0000002
81	GLOBAL	-0.0000001	-0.0000001	0.0000038	0.0000251	0.0000415	-0.0000030
92	GLOBAL	-0.0000001	-0.0000001	0.0000030	0.0000204	0.0000417	-0.0000038
103	GLOBAL	-0.0000002	-0.0000001	0.0000023	0.0000189	0.0000380	-0.0000033
16	GLOBAL	0.0000002	-0.0000000	0.0000025	0.0000085	-0.0000379	0.0000017
27	GLOBAL	0.0000002	-0.0000000	0.0000033	0.0000085	-0.0000439	0.0000036
38	GLOBAL	0.0000001	-0.0000000	0.0000041	0.0000115	-0.0000486	0.0000060
49	GLOBAL	0.0000001	0.0000000	0.0000050	0.0000230	-0.0000402	0.0000177
60	GLOBAL	-0.0000000	0.0000000	0.0000054	0.0000385	0.0000024	-0.0000002
71	GLOBAL	-0.0000001	-0.0000000	0.0000049	0.0000213	0.0000425	-0.0000065
82	GLOBAL	-0.0000002	-0.0000000	0.0000041	0.0000111	0.0000494	-0.0000026
93	GLOBAL	-0.0000002	-0.0000000	0.0000033	0.0000084	0.0000445	-0.0000017
104	GLOBAL	-0.0000003	-0.0000000	0.0000025	0.0000086	0.0000384	-0.0000016
18	GLOBAL	0.0000003	0.0000000	0.0000025	-0.0000086	-0.0000381	-0.0000023
29	GLOBAL	0.0000002	0.0000000	0.0000033	-0.0000084	-0.0000439	-0.0000035
40	GLOBAL	0.0000002	0.0000000	0.0000041	-0.0000111	-0.0000486	-0.0000046
51	GLOBAL	0.0000001	0.0000000	0.0000049	-0.0000213	-0.0000436	-0.0000034
62	GLOBAL	0.0000000	-0.0000000	0.0000054	-0.0000385	-0.0000055	0.0000084
73	GLOBAL	-0.0000001	-0.0000000	0.0000050	-0.0000230	0.0000420	0.0000128
84	GLOBAL	-0.0000001	0.0000000	0.0000041	-0.0000115	0.0000489	0.0000053
95	GLOBAL	-0.0000002	0.0000000	0.0000033	-0.0000085	0.0000440	0.0000033
106	GLOBAL	-0.0000002	0.0000000	0.0000025	-0.0000085	0.0000379	0.0000015
19	GLOBAL	0.0000002	0.0000001	0.0000023	-0.0000189	-0.0000380	-0.0000033
30	GLOBAL	0.0000001	0.0000001	0.0000030	-0.0000204	-0.0000416	-0.0000042
41	GLOBAL	0.0000001	0.0000001	0.0000038	-0.0000251	-0.0000411	-0.0000041
52	GLOBAL	0.0000000	0.0000001	0.0000044	-0.0000344	-0.0000300	-0.0000011
63	GLOBAL	0.0000000	0.0000001	0.0000047	-0.0000420	-0.0000037	0.0000070
74	GLOBAL	-0.0000000	0.0000001	0.0000045	-0.0000346	0.0000263	0.0000145
85	GLOBAL	-0.0000000	0.0000001	0.0000038	-0.0000255	0.0000387	0.0000123
96	GLOBAL	-0.0000001	0.0000001	0.0000030	-0.0000210	0.0000399	0.0000085
107	GLOBAL	-0.0000001	0.0000001	0.0000023	-0.0000195	0.0000363	0.0000053
20	GLOBAL	0.0000001	0.0000002	0.0000019	-0.0000288	-0.0000364	-0.0000038
31	GLOBAL	0.0000001	0.0000002	0.0000026	-0.0000306	-0.0000387	-0.0000041
42	GLOBAL	0.0000000	0.0000002	0.0000033	-0.0000338	-0.0000352	-0.0000031

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
53	GLOBAL	0.0000000	0.0000003	0.0000038	-0.0000386	-0.0000230	0.0000005
64	GLOBAL	0.0000000	0.0000003	0.0000040	-0.0000414	-0.0000030	0.0000070
75	GLOBAL	0.0000000	0.0000003	0.0000038	-0.0000388	0.0000183	0.0000136
86	GLOBAL	0.0000000	0.0000003	0.0000033	-0.0000340	0.0000316	0.0000155
97	GLOBAL	-0.0000000	0.0000002	0.0000026	-0.0000312	0.0000354	0.0000140
108	GLOBAL	-0.0000000	0.0000002	0.0000019	-0.0000301	0.0000328	0.0000103
21	GLOBAL	0.0000000	0.0000003	0.0000013	-0.0000372	-0.0000342	-0.0000046
32	GLOBAL	0.0000000	0.0000004	0.0000020	-0.0000370	-0.0000373	-0.0000051
43	GLOBAL	-0.0000000	0.0000004	0.0000027	-0.0000370	-0.0000328	-0.0000024
54	GLOBAL	-0.0000000	0.0000005	0.0000032	-0.0000381	-0.0000206	0.0000020
65	GLOBAL	0.0000000	0.0000005	0.0000034	-0.0000389	-0.0000028	0.0000074
76	GLOBAL	0.0000001	0.0000005	0.0000032	-0.0000384	0.0000156	0.0000127
87	GLOBAL	0.0000001	0.0000005	0.0000027	-0.0000374	0.0000289	0.0000164
98	GLOBAL	0.0000001	0.0000004	0.0000020	-0.0000378	0.0000336	0.0000181
109	GLOBAL	0.0000000	0.0000003	0.0000013	-0.0000386	0.0000299	0.0000179

LOADING - 2 SIDE WIND LOAD

SUPPORT JOINT REACTION LOADS LOADING - 2

JOINT		FORCE			MOMENT		
		X FORCE	Y FORCE	Z FORCE	X MOMENT	Y MOMENT	Z MOMENT
1	GLOBAL	-1.1405525	-2.4279966	0.3272321	-0.0000000	0.4706269	-0.1712946
11	GLOBAL	0.6917294	-1.2813377	-0.3351918	-0.0000000	-0.1035464	-0.0376879
111	GLOBAL	1.1856432	-2.4599180	0.3552107	0.0000000	-0.4073128	0.1482500
121	GLOBAL	-0.7368197	-1.3307352	-0.3472507	0.0000000	0.1198307	0.0436149

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - 2

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
1	GLOBAL	0.0	0.0	0.0	0.0003182	0.0	0.0
11	GLOBAL	0.0	0.0	0.0	0.0001713	0.0	0.0
111	GLOBAL	0.0	0.0	0.0	0.0003204	0.0	0.0
121	GLOBAL	0.0	0.0	0.0	0.0001803	0.0	0.0

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 2

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
6	GLOBAL	0.0000001	0.0000025	-0.0000017	-0.0001693	-0.0000195	-0.0000012
116	GLOBAL	0.0000004	0.0000026	-0.0000018	-0.0001815	0.0000245	0.0000088
2	GLOBAL	0.0000001	0.0000028	0.0000034	0.0001716	-0.0001830	0.0001380
3	GLOBAL	-0.0000000	0.0000041	0.0000048	0.0000299	-0.0001496	0.0001116
4	GLOBAL	-0.0000000	0.0000043	0.0000040	-0.0001087	-0.0001010	0.0000652
5	GLOBAL	0.0000000	0.0000036	0.0000014	-0.0001906	-0.0000513	0.0000428
7	GLOBAL	0.0000001	0.0000032	-0.0000038	-0.0000830	0.0000054	0.0000068
8	GLOBAL	0.0000002	0.0000033	-0.0000045	0.0000096	0.0000279	0.0000123
9	GLOBAL	0.0000002	0.0000027	-0.0000038	0.0000839	0.0000512	0.0000181
10	GLOBAL	0.0000002	0.0000016	-0.0000021	0.0001299	0.0000724	0.0000106
12	GLOBAL	0.0000006	0.0000040	0.0000045	0.0002253	-0.0004516	0.0002567
23	GLOBAL	0.0000006	0.0000083	0.0000134	0.0000025	-0.0005036	0.0002649
34	GLOBAL	0.0000005	0.0000118	0.0000218	-0.0001769	-0.0003956	0.0002017
45	GLOBAL	0.0000004	0.0000141	0.0000274	-0.0002882	-0.0002144	0.0001154
56	GLOBAL	0.0000003	0.0000150	0.0000296	-0.0003281	-0.0000021	0.0000222
67	GLOBAL	0.0000002	0.0000143	0.0000279	-0.0002962	0.0002128	-0.0000689
78	GLOBAL	0.0000001	0.0000122	0.0000227	-0.0001923	0.0004026	-0.0001473
89	GLOBAL	0.0000000	0.0000088	0.0000147	-0.0000192	0.0005271	-0.0001922
100	GLOBAL	0.0000000	0.0000045	0.0000057	0.0001903	0.0004967	-0.0001625
17	GLOBAL	0.0000001	0.0000026	-0.0000015	-0.0002106	-0.0000069	0.0000098
28	GLOBAL	0.0000001	0.0000028	-0.0000014	-0.0002560	-0.0000015	0.0000123
39	GLOBAL	0.0000001	0.0000030	-0.0000014	-0.0002977	0.0000008	0.0000109
50	GLOBAL	0.0000002	0.0000031	-0.0000014	-0.0003273	0.0000019	0.0000058
61	GLOBAL	0.0000002	0.0000032	-0.0000014	-0.0003387	0.0000018	-0.0000007
72	GLOBAL	0.0000003	0.0000031	-0.0000014	-0.0003296	0.0000009	-0.0000070
83	GLOBAL	0.0000004	0.0000030	-0.0000014	-0.0003022	0.0000002	-0.0000117
94	GLOBAL	0.0000004	0.0000028	-0.0000014	-0.0002626	0.0000020	-0.0000128
105	GLOBAL	0.0000004	0.0000027	-0.0000015	-0.0002194	0.0000092	-0.0000087
22	GLOBAL	-0.0000000	0.0000017	-0.0000013	0.0001416	0.0001294	0.0000429
33	GLOBAL	-0.0000000	0.0000031	-0.0000036	0.0000922	0.0001411	0.0000534
44	GLOBAL	0.0000000	0.0000042	-0.0000057	0.0000514	0.0001107	0.0000428
55	GLOBAL	0.0000001	0.0000049	-0.0000071	0.0000271	0.0000597	0.0000215
66	GLOBAL	0.0000002	0.0000051	-0.0000076	0.0000201	-0.0000005	-0.0000044
77	GLOBAL	0.0000003	0.0000048	-0.0000070	0.0000301	-0.0000599	-0.0000313
88	GLOBAL	0.0000004	0.0000041	-0.0000055	0.0000575	-0.0001088	-0.0000562
99	GLOBAL	0.0000004	0.0000030	-0.0000033	0.0001017	-0.0001349	-0.0000741
110	GLOBAL	0.0000004	0.0000017	-0.0000009	0.0001572	-0.0001172	-0.0000722
112	GLOBAL	0.0000005	0.0000027	0.0000031	0.0001656	0.0002758	-0.0000437
113	GLOBAL	0.0000007	0.0000041	0.0000047	0.0000402	0.0001999	-0.0000666
114	GLOBAL	0.0000006	0.0000044	0.0000040	-0.0000979	0.0001260	-0.0000420
115	GLOBAL	0.0000006	0.0000037	0.0000014	-0.0001861	0.0000631	-0.0000258
117	GLOBAL	0.0000004	0.0000034	-0.0000041	-0.0000897	0.0000047	-0.0000097
118	GLOBAL	0.0000003	0.0000035	-0.0000048	0.0000091	-0.0000130	-0.0000217

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 2

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
119	GLOBAL	0.0000002	0.0000029	-0.0000041	0.0000882	-0.0000318	-0.0000336
120	GLOBAL	0.0000002	0.0000018	-0.0000023	0.0001405	-0.0000432	-0.0000437
13	GLOBAL	-0.0000001	0.0000052	0.0000074	0.0001108	-0.0002983	0.0002438
24	GLOBAL	0.0000001	0.0000082	0.0000133	-0.0000458	-0.0003292	0.0002208
35	GLOBAL	0.0000002	0.0000108	0.0000190	-0.0001859	-0.0002672	0.0001659
46	GLOBAL	0.0000003	0.0000125	0.0000229	-0.0002785	-0.0001461	0.0000982
57	GLOBAL	0.0000003	0.0000131	0.0000245	-0.0003124	0.0000032	0.0000264
68	GLOBAL	0.0000003	0.0000126	0.0000233	-0.0002845	0.0001548	-0.0000427
79	GLOBAL	0.0000004	0.0000110	0.0000196	-0.0001964	0.0002830	-0.0001014
90	GLOBAL	0.0000005	0.0000086	0.0000141	-0.0000586	0.0003561	-0.0001377
101	GLOBAL	0.0000006	0.0000056	0.0000081	0.0000954	0.0003410	-0.0001258
14	GLOBAL	-0.0000001	0.0000057	0.0000079	-0.0000377	-0.0001910	0.0001421
25	GLOBAL	-0.0000001	0.0000076	0.0000118	-0.0001556	-0.0002070	0.0001522
36	GLOBAL	0.0000001	0.0000094	0.0000154	-0.0002642	-0.0001694	0.0001229
47	GLOBAL	0.0000002	0.0000106	0.0000180	-0.0003388	-0.0000919	0.0000770
58	GLOBAL	0.0000003	0.0000110	0.0000190	-0.0003664	0.0000059	0.0000265
69	GLOBAL	0.0000004	0.0000107	0.0000182	-0.0003425	0.0001051	-0.0000212
80	GLOBAL	0.0000005	0.0000096	0.0000158	-0.0002703	0.0001871	-0.0000594
91	GLOBAL	0.0000006	0.0000079	0.0000123	-0.0001630	0.0002336	-0.0000818
102	GLOBAL	0.0000007	0.0000060	0.0000083	-0.0000489	0.0002340	-0.0000835
15	GLOBAL	-0.0000001	0.0000053	0.0000061	-0.0001760	-0.0001174	0.0000854
26	GLOBAL	-0.0000001	0.0000064	0.0000083	-0.0002657	-0.0001190	0.0000943
37	GLOBAL	0.0000000	0.0000075	0.0000104	-0.0003502	-0.0000946	0.0000814
48	GLOBAL	0.0000001	0.0000082	0.0000119	-0.0004100	-0.0000498	0.0000542
59	GLOBAL	0.0000003	0.0000085	0.0000125	-0.0004324	0.0000061	0.0000221
70	GLOBAL	0.0000004	0.0000083	0.0000120	-0.0004132	0.0000624	-0.0000085
81	GLOBAL	0.0000005	0.0000076	0.0000107	-0.0003559	0.0001087	-0.0000327
92	GLOBAL	0.0000006	0.0000066	0.0000087	-0.0002720	0.0001367	-0.0000470
103	GLOBAL	0.0000007	0.0000054	0.0000063	-0.0001802	0.0001422	-0.0000507
16	GLOBAL	-0.0000000	0.0000040	0.0000024	-0.0002493	-0.0000561	0.0000400
27	GLOBAL	0.0000000	0.0000046	0.0000034	-0.0003187	-0.0000520	0.0000426
38	GLOBAL	0.0000001	0.0000052	0.0000043	-0.0003834	-0.0000393	0.0000393
49	GLOBAL	0.0000002	0.0000056	0.0000049	-0.0004293	-0.0000192	0.0000284
60	GLOBAL	0.0000002	0.0000057	0.0000052	-0.0004468	0.0000047	0.0000135
71	GLOBAL	0.0000003	0.0000056	0.0000050	-0.0004326	0.0000282	-0.0000011
82	GLOBAL	0.0000004	0.0000053	0.0000045	-0.0003893	0.0000475	-0.0000124
93	GLOBAL	0.0000005	0.0000047	0.0000036	-0.0003251	0.0000607	-0.0000186
104	GLOBAL	0.0000006	0.0000042	0.0000026	-0.0002523	0.0000677	-0.0000198
18	GLOBAL	0.0000001	0.0000034	-0.0000041	-0.0001074	0.0000244	0.0000153
29	GLOBAL	0.0000002	0.0000038	-0.0000046	-0.0001322	0.0000312	0.0000188
40	GLOBAL	0.0000002	0.0000042	-0.0000051	-0.0001555	0.0000281	0.0000162
51	GLOBAL	0.0000002	0.0000044	-0.0000055	-0.0001719	0.0000176	0.0000086
62	GLOBAL	0.0000002	0.0000046	-0.0000056	-0.0001775	0.0000030	-0.0000021
73	GLOBAL	0.0000002	0.0000045	-0.0000055	-0.0001712	-0.0000120	-0.0000132

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 2

JOINT		/----------DISPLACEMENT----------			//----------ROTATION----------/		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
84	GLOBAL	0.0000003	0.0000042	-0.0000051	-0.0001548	-0.0000231	-0.0000218
95	GLOBAL	0.0000003	0.0000039	-0.0000047	-0.0001326	-0.0000258	-0.0000250
106	GLOBAL	0.0000003	0.0000035	-0.0000043	-0.0001099	-0.0000161	-0.0000207
19	GLOBAL	0.0000002	0.0000036	-0.0000051	-0.0000131	0.0000465	0.0000205
30	GLOBAL	0.0000002	0.0000042	-0.0000060	-0.0000344	0.0000531	0.0000230
41	GLOBAL	0.0000002	0.0000047	-0.0000068	-0.0000533	0.0000459	0.0000193
52	GLOBAL	0.0000002	0.0000050	-0.0000074	-0.0000661	0.0000275	0.0000097
63	GLOBAL	0.0000002	0.0000052	-0.0000076	-0.0000701	0.0000029	-0.0000038
74	GLOBAL	0.0000002	0.0000051	-0.0000074	-0.0000645	-0.0000215	-0.0000183
85	GLOBAL	0.0000002	0.0000047	-0.0000068	-0.0000507	-0.0000392	-0.0000303
96	GLOBAL	0.0000002	0.0000042	-0.0000060	-0.0000317	-0.0000443	-0.0000356
107	GLOBAL	0.0000002	0.0000037	-0.0000053	-0.0000108	-0.0000336	-0.0000318
20	GLOBAL	0.0000003	0.0000033	-0.0000048	0.0000617	0.0000684	0.0000271
31	GLOBAL	0.0000003	0.0000041	-0.0000059	0.0000368	0.0000744	0.0000293
42	GLOBAL	0.0000002	0.0000047	-0.0000071	0.0000142	0.0000628	0.0000237
53	GLOBAL	0.0000002	0.0000052	-0.0000079	-0.0000005	0.0000365	0.0000115
64	GLOBAL	0.0000002	0.0000053	-0.0000082	-0.0000049	0.0000025	-0.0000051
75	GLOBAL	0.0000002	0.0000052	-0.0000079	0.0000014	-0.0000309	-0.0000232
86	GLOBAL	0.0000002	0.0000047	-0.0000071	0.0000177	-0.0000555	-0.0000393
97	GLOBAL	0.0000001	0.0000041	-0.0000059	0.0000415	-0.0000635	-0.0000493
108	GLOBAL	0.0000001	0.0000034	-0.0000048	0.0000690	-0.0000518	-0.0000460
21	GLOBAL	0.0000002	0.0000026	-0.0000034	0.0001144	0.0000929	0.0000360
32	GLOBAL	0.0000002	0.0000036	-0.0000050	0.0000794	0.0001012	0.0000415
43	GLOBAL	0.0000002	0.0000045	-0.0000065	0.0000487	0.0000834	0.0000323
54	GLOBAL	0.0000002	0.0000051	-0.0000076	0.0000295	0.0000468	0.0000154
65	GLOBAL	0.0000002	0.0000052	-0.0000080	0.0000239	0.0000014	-0.0000056
76	GLOBAL	0.0000002	0.0000050	-0.0000076	0.0000321	-0.0000433	-0.0000278
87	GLOBAL	0.0000002	0.0000045	-0.0000064	0.0000536	-0.0000776	-0.0000486
98	GLOBAL	0.0000002	0.0000036	-0.0000049	0.0000865	-0.0000918	-0.0000652
109	GLOBAL	0.0000001	0.0000026	-0.0000033	0.0001244	-0.0000778	-0.0000727

PAGE - 33

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$ POST PROCESSING PROGRAM 'QQSTDPBS' OF APPENDIX M
$ TO OBTAIN TOTAL STRESSES FROM BENDING AND IN PLANE EFFECTS
EXECUTE PROGRAM 'QQSTDPBS'
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PAGE - 34

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****************************
*RESULTS OF LATEST ANALYSIS*
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PROBLEM - SHELL TITLE - FOLDED PLATE USING PBSQ2

ACTIVE UNITS FEET KIPS DEG. FAHR SEC LBM

LOADING - 1

/-ELEMENT-//																
10	+T/2	SX	-4.41172E-01	SY	-1.18024E+00	SXY	6.22130E-01	TMAX	7.23604E-01	S1	-8.71024E-02	S2	-1.53431E+00	SI	1.53431E+00
	MID	SX	-7.96083E-01	SY	-1.11304E+00	SXY	6.84327E-01	TMAX	7.02437E-01	S1	-2.52122E-01	S2	-1.65700E+00	SI	1.65700E+00
	-T/2	SX	-1.15099E+00	SY	-1.04583E+00	SXY	7.46523E-01	TMAX	7.48373E-01	S1	-3.50039E-01	S2	-1.84678E+00	SI	1.84678E+00
11	+T/2	SX	8.82538E-02	SY	-6.88824E-01	SXY	2.44449E-01	TMAX	4.59040E-01	S1	1.58755E-01	S2	-7.59326E-01	SI	9.18081E-01
	MID	SX	-4.24819E-02	SY	-6.05964E-01	SXY	3.25133E-01	TMAX	4.30220E-01	S1	1.05997E-01	S2	-7.54443E-01	SI	8.60440E-01
	-T/2	SX	-1.73218E-01	SY	-5.23104E-01	SXY	4.05816E-01	TMAX	4.41918E-01	S1	9.37575E-02	S2	-7.90079E-01	SI	8.83837E-01
12	+T/2	SX	2.24028E-02	SY	-4.67381E-01	SXY	1.66857E-01	TMAX	2.96333E-01	S1	7.38441E-02	S2	-5.18823E-01	SI	5.92667E-01
	MID	SX	-9.30738E-03	SY	-2.99942E-01	SXY	1.99223E-01	TMAX	2.46591E-01	S1	9.19661E-02	S2	-4.01216E-01	SI	4.93182E-01
	-T/2	SX	-4.10176E-02	SY	-1.32504E-01	SXY	2.31589E-01	TMAX	2.36064E-01	S1	1.49303E-01	S2	-3.22824E-01	SI	4.72127E-01
13	+T/2	SX	3.13067E-04	SY	-2.78975E-01	SXY	1.07609E-01	TMAX	1.76296E-01	S1	3.69649E-02	S2	-3.15627E-01	SI	3.52591E-01
	MID	SX	-2.11225E-02	SY	-9.46813E-02	SXY	1.06326E-01	TMAX	1.12507E-01	S1	5.46054E-02	S2	-1.70409E-01	SI	2.25015E-01
	-T/2	SX	-4.25581E-02	SY	8.96121E-02	SXY	1.05042E-01	TMAX	1.24101E-01	S1	1.47628E-01	S2	-1.00574E-01	SI	2.48202E-01
14	+T/2	SX	2.80463E-03	SY	-1.74689E-01	SXY	3.31501E-02	TMAX	9.47363E-02	S1	8.79389E-03	S2	-1.80679E-01	SI	1.89473E-01
	MID	SX	-2.23815E-02	SY	-6.18607E-03	SXY	1.11159E-02	TMAX	1.37527E-02	S1	-5.31144E-04	S2	-2.80365E-02	SI	2.80365E-02
	-T/2	SX	-4.75677E-02	SY	1.62317E-01	SXY	-1.09184E-02	TMAX	1.05509E-01	S1	1.62884E-01	S2	-4.81341E-02	SI	2.11018E-01
15	+T/2	SX	1.32718E-02	SY	-1.66779E-01	SXY	-4.85894E-02	TMAX	1.02301E-01	S1	2.55474E-02	S2	-1.79054E-01	SI	2.04602E-01
	MID	SX	-2.96772E-02	SY	-1.29155E-02	SXY	-2.54988E-02	TMAX	2.68407E-02	S1	5.54435E-03	S2	-4.81371E-02	SI	5.36815E-02
	-T/2	SX	-7.26262E-02	SY	1.40948E-01	SXY	-2.40807E-03	TMAX	1.06814E-01	S1	1.40975E-01	S2	-7.26534E-02	SI	2.13628E-01
16	+T/2	SX	-4.38337E-02	SY	-3.21398E-01	SXY	-1.42624E-01	TMAX	1.99003E-01	S1	1.63868E-02	S2	-3.81618E-01	SI	3.98005E-01
	MID	SX	-6.64688E-02	SY	-1.49485E-01	SXY	-1.33645E-01	TMAX	1.39943E-01	S1	3.19655E-02	S2	-2.47920E-01	SI	2.79885E-01
	-T/2	SX	-8.91040E-02	SY	2.24271E-02	SXY	-1.24666E-01	TMAX	1.36570E-01	S1	1.03232E-01	S2	-1.69909E-01	SI	2.73140E-01
17	+T/2	SX	-9.21000E-02	SY	-5.40958E-01	SXY	-2.28717E-01	TMAX	3.20437E-01	S1	3.90792E-03	S2	-6.36966E-01	SI	6.40874E-01
	MID	SX	-1.15803E-01	SY	-3.82917E-01	SXY	-2.42942E-01	TMAX	2.77233E-01	S1	2.78733E-02	S2	-5.26594E-01	SI	5.54467E-01
	-T/2	SX	-1.39507E-01	SY	-2.24876E-01	SXY	-2.57168E-01	TMAX	2.60686E-01	S1	7.84946E-02	S2	-4.42877E-01	SI	5.21372E-01
18	+T/2	SX	-1.59317E-01	SY	-7.97121E-01	SXY	-3.50545E-01	TMAX	4.73899E-01	S1	-4.32056E-03	S2	-9.52118E-01	SI	9.52118E-01
	MID	SX	-2.31899E-01	SY	-6.96654E-01	SXY	-3.91603E-01	TMAX	4.55360E-01	S1	-8.91644E-03	S2	-9.19636E-01	SI	9.19636E-01
	-T/2	SX	-3.04480E-01	SY	-5.96187E-01	SXY	-4.32662E-01	TMAX	4.56585E-01	S1	6.25128E-03	S2	-9.06919E-01	SI	9.13170E-01

PAGE - 35

19	+T/2	SX	-1.51069E-01	SY	-1.02240E+00	SXY	-6.39465E-01	TMAX	7.73770E-01	S1	1.87036E-01	S2	-1.36050E+00	SI	1.54754E+00
	MID	SX	-6.05257E-01	SY	-1.08396E+00	SXY	-6.77186E-01	TMAX	7.18240E-01	S1	-1.26366E-01	S2	-1.56285E+00	SI	1.56285E+00
	-T/2	SX	-1.05944E+00	SY	-1.14551E+00	SXY	-7.14907E-01	TMAX	7.16201E-01	S1	-3.86277E-01	S2	-1.81868E+00	SI	1.81868E+00
20	+T/2	SX	-1.75221E-01	SY	-1.64851E-01	SXY	2.90087E-01	TMAX	2.90133E-01	S1	1.20097E-01	S2	-4.60169E-01	SI	5.80266E-01
	MID	SX	-2.35668E-01	SY	-8.59267E-02	SXY	2.43841E-01	TMAX	2.55076E-01	S1	9.42790E-02	S2	-4.15873E-01	SI	5.10152E-01
	-T/2	SX	-2.96114E-01	SY	-7.00214E-03	SXY	1.97594E-01	TMAX	2.44826E-01	S1	9.32684E-02	S2	-3.96384E-01	SI	4.89653E-01
21	+T/2	SX	-2.10198E-01	SY	-4.39108E-01	SXY	4.05460E-01	TMAX	4.21305E-01	S1	9.66517E-02	S2	-7.45958E-01	SI	8.42609E-01
	MID	SX	-2.45682E-01	SY	-3.12890E-01	SXY	4.16558E-01	TMAX	4.17911E-01	S1	1.38625E-01	S2	-6.97197E-01	SI	8.35822E-01
	-T/2	SX	-2.81166E-01	SY	-1.86672E-01	SXY	4.27656E-01	TMAX	4.30258E-01	S1	1.96338E-01	S2	-6.64177E-01	SI	8.60515E-01
22	+T/2	SX	-1.25796E-01	SY	-4.31622E-01	SXY	3.15357E-01	TMAX	3.50475E-01	S1	7.17659E-02	S2	-6.29183E-01	SI	7.00949E-01
	MID	SX	-1.48230E-01	SY	-2.43699E-01	SXY	3.41583E-01	TMAX	3.44902E-01	S1	1.48938E-01	S2	-5.40867E-01	SI	6.89805E-01
	-T/2	SX	-1.70665E-01	SY	-5.57754E-02	SXY	3.67809E-01	TMAX	3.72268E-01	S1	2.59048E-01	S2	-4.85488E-01	SI	7.44537E-01
23	+T/2	SX	-1.12500E-01	SY	-3.53013E-01	SXY	2.12372E-01	TMAX	2.44057E-01	S1	1.13000E-02	S2	-4.76813E-01	SI	4.88113E-01
	MID	SX	-1.49599E-01	SY	-1.40700E-01	SXY	2.24344E-01	TMAX	2.24388E-01	S1	7.92381E-02	S2	-3.69538E-01	SI	4.48776E-01
	-T/2	SX	-1.86698E-01	SY	7.16122E-02	SXY	2.36315E-01	TMAX	2.69306E-01	S1	2.11763E-01	S2	-3.26849E-01	SI	5.38613E-01
24	+T/2	SX	-5.68048E-02	SY	-1.92442E-01	SXY	7.97466E-02	TMAX	1.04685E-01	S1	-1.99387E-02	S2	-2.29308E-01	SI	2.29308E-01
	MID	SX	-1.37969E-01	SY	-5.68423E-02	SXY	6.97865E-02	TMAX	8.07188E-02	S1	-1.66866E-02	S2	-1.78124E-01	SI	1.78124E-01
	-T/2	SX	-2.19133E-01	SY	7.87576E-02	SXY	5.98265E-02	TMAX	1.60511E-01	S1	9.03237E-02	S2	-2.30699E-01	SI	3.21022E-01
25	+T/2	SX	-7.41966E-02	SY	-2.14074E-01	SXY	-1.13961E-01	TMAX	1.33711E-01	S1	-1.04244E-02	S2	-2.77846E-01	SI	2.77846E-01
	MID	SX	-1.50162E-01	SY	-7.42556E-02	SXY	-1.07252E-01	TMAX	1.13770E-01	S1	1.56087E-03	S2	-2.25978E-01	SI	2.27539E-01
	-T/2	SX	-2.26127E-01	SY	6.55629E-02	SXY	-1.00543E-01	TMAX	1.77143E-01	S1	9.68611E-02	S2	-2.57425E-01	SI	3.54286E-01
26	+T/2	SX	-1.47982E-01	SY	-3.64480E-01	SXY	-2.51424E-01	TMAX	2.73737E-01	S1	1.75055E-02	S2	-5.29968E-01	SI	5.47473E-01
	MID	SX	-1.79786E-01	SY	-1.65859E-01	SXY	-2.59400E-01	TMAX	2.59493E-01	S1	8.66709E-02	S2	-4.32315E-01	SI	5.18986E-01
	-T/2	SX	-2.11589E-01	SY	3.27630E-02	SXY	-2.67375E-01	TMAX	2.93967E-01	S1	2.04554E-01	S2	-3.83380E-01	SI	5.87934E-01
27	+T/2	SX	-1.83509E-01	SY	-4.40480E-01	SXY	-3.38364E-01	TMAX	3.61937E-01	S1	4.99431E-02	S2	-6.73932E-01	SI	7.23875E-01
	MID	SX	-1.86514E-01	SY	-2.53663E-01	SXY	-3.60890E-01	TMAX	3.62449E-01	S1	1.42360E-01	S2	-5.82537E-01	SI	7.24898E-01
	-T/2	SX	-1.89519E-01	SY	-6.68451E-02	SXY	-3.83417E-01	TMAX	3.88292E-01	S1	2.60110E-01	S2	-5.16474E-01	SI	7.76584E-01
28	+T/2	SX	-2.07782E-01	SY	-4.33879E-01	SXY	-3.90146E-01	TMAX	4.06194E-01	S1	8.53635E-02	S2	-7.27024E-01	SI	8.12388E-01
	MID	SX	-2.23712E-01	SY	-3.03789E-01	SXY	-4.00476E-01	TMAX	4.02472E-01	S1	1.38722E-01	S2	-6.66223E-01	SI	8.04945E-01
	-T/2	SX	-2.39641E-01	SY	-1.73699E-01	SXY	-4.10806E-01	TMAX	4.12127E-01	S1	2.05457E-01	S2	-6.18797E-01	SI	8.24254E-01
29	+T/2	SX	-2.02606E-01	SY	-2.85589E-01	SXY	-3.49416E-01	TMAX	3.51871E-01	S1	1.07773E-01	S2	-5.95968E-01	SI	7.03741E-01
	MID	SX	-2.83161E-01	SY	-2.49083E-01	SXY	-3.11693E-01	TMAX	3.12159E-01	S1	4.60365E-02	S2	-5.78281E-01	SI	6.24317E-01
	-T/2	SX	-3.63715E-01	SY	-2.12578E-01	SXY	-2.73971E-01	TMAX	2.84202E-01	S1	-3.94505E-03	S2	-5.72348E-01	SI	5.72348E-01
30	+T/2	SX	-8.12804E-02	SY	-6.64752E-02	SXY	1.84075E-01	TMAX	1.84223E-01	S1	1.10346E-01	S2	-2.58101E-01	SI	3.68447E-01
	MID	SX	4.70623E-02	SY	-1.05220E-02	SXY	1.48636E-01	TMAX	1.51399E-01	S1	1.69669E-01	S2	-1.33129E-01	SI	3.02798E-01
	-T/2	SX	1.75405E-01	SY	4.54311E-02	SXY	1.13198E-01	TMAX	1.30526E-01	S1	2.40944E-01	S2	-2.01082E-02	SI	2.61052E-01
31	+T/2	SX	-2.48425E-01	SY	-2.40619E-01	SXY	2.97691E-01	TMAX	2.97716E-01	S1	5.31945E-02	S2	-5.42239E-01	SI	5.95433E-01
	MID	SX	-1.37544E-01	SY	-1.15627E-01	SXY	3.19436E-01	TMAX	3.19624E-01	S1	1.93039E-01	S2	-4.46210E-01	SI	6.39248E-01

	-T/2	SX	-2.66625E-02	SY	9.36527E-03	SXY	3.41182E-01	TMAX	3.41657E-01	S1	3.33008E-01	S2	-3.50305E-01	SI	6.83314E-01
32	+T/2	SX	-2.99622E-01	SY	-3.94855E-01	SXY	2.95853E-01	TMAX	2.99660E-01	S1	-4.75782E-02	S2	-6.46899E-01	SI	6.46899E-01
	MID	SX	-2.16598E-01	SY	-1.97295E-01	SXY	3.56679E-01	TMAX	3.56810E-01	S1	1.49864E-01	S2	-5.63756E-01	SI	7.13619E-01
	-T/2	SX	-1.33574E-01	SY	2.65869E-04	SXY	4.17505E-01	TMAX	4.22834E-01	S1	3.56181E-01	S2	-4.89488E-01	SI	8.45669E-01
33	+T/2	SX	-3.12272E-01	SY	-4.41346E-01	SXY	2.29635E-01	TMAX	2.38532E-01	S1	-1.38277E-01	S2	-6.15341E-01	SI	6.15341E-01
	MID	SX	-2.87141E-01	SY	-1.85013E-01	SXY	2.92614E-01	TMAX	2.97036E-01	S1	6.09589E-02	S2	-5.33112E-01	SI	5.94071E-01
	-T/2	SX	-2.62009E-01	SY	7.13206E-02	SXY	3.55592E-01	TMAX	3.92712E-01	S1	2.97368E-01	S2	-4.86056E-01	SI	7.85424E-01
34	+T/2	SX	-2.85177E-01	SY	-2.98950E-01	SXY	1.43306E-01	TMAX	1.43471E-01	S1	-1.48592E-01	S2	-4.35535E-01	SI	4.35535E-01
	MID	SX	-3.29283E-01	SY	-1.08930E-01	SXY	1.33394E-01	TMAX	1.73011E-01	S1	-4.60956E-02	S2	-3.92118E-01	SI	3.92118E-01
	-T/2	SX	-3.73389E-01	SY	8.10896E-02	SXY	1.23482E-01	TMAX	2.58623E-01	S1	1.12473E-01	S2	-4.04773E-01	SI	5.17245E-01
35	+T/2	SX	-2.52042E-01	SY	-3.05998E-01	SXY	-1.61814E-01	TMAX	1.64048E-01	S1	-1.14972E-01	S2	-4.43068E-01	SI	4.43068E-01
	MID	SX	-3.40217E-01	SY	-1.55211E-01	SXY	-1.72328E-01	TMAX	1.95586E-01	S1	-5.21280E-02	S2	-4.43300E-01	SI	4.43300E-01
	-T/2	SX	-4.28391E-01	SY	-4.42351E-03	SXY	-1.82842E-01	TMAX	2.79943E-01	S1	6.35359E-02	S2	-4.96351E-01	SI	5.59887E-01
36	+T/2	SX	-3.24336E-01	SY	-4.52493E-01	SXY	-2.60628E-01	TMAX	2.68390E-01	S1	-1.20025E-01	S2	-6.56805E-01	SI	6.56805E-01
	MID	SX	-2.91689E-01	SY	-1.99933E-01	SXY	-3.18313E-01	TMAX	3.21602E-01	S1	7.57912E-02	S2	-5.67413E-01	SI	6.43205E-01
	-T/2	SX	-2.59042E-01	SY	5.26270E-02	SXY	-3.75998E-01	TMAX	4.07012E-01	S1	3.03804E-01	S2	-5.10220E-01	SI	8.14024E-01
37	+T/2	SX	-3.17823E-01	SY	-4.09909E-01	SXY	-3.11487E-01	TMAX	3.14872E-01	S1	-4.89942E-02	S2	-6.78738E-01	SI	6.78738E-01
	MID	SX	-2.17231E-01	SY	-2.02073E-01	SXY	-3.69975E-01	TMAX	3.70052E-01	S1	1.60400E-01	S2	-5.79704E-01	SI	7.40104E-01
	-T/2	SX	-1.16638E-01	SY	5.76288E-03	SXY	-4.28462E-01	TMAX	4.32811E-01	S1	3.77373E-01	S2	-4.88248E-01	SI	8.65621E-01
38	+T/2	SX	-2.64336E-01	SY	-2.86807E-01	SXY	-3.19122E-01	TMAX	3.19320E-01	S1	4.37483E-02	S2	-5.94891E-01	SI	6.38639E-01
	MID	SX	-1.44981E-01	SY	-1.61477E-01	SXY	-3.41498E-01	TMAX	3.41597E-01	S1	1.88368E-01	S2	-4.94826E-01	SI	6.83194E-01
	-T/2	SX	-2.56269E-02	SY	-3.61472E-02	SXY	-3.63873E-01	TMAX	3.63911E-01	S1	3.33024E-01	S2	-3.94798E-01	SI	7.27822E-01
39	+T/2	SX	-1.46904E-01	SY	-1.35975E-01	SXY	-2.14198E-01	TMAX	2.14267E-01	S1	7.28277E-02	S2	-3.55707E-01	SI	4.28535E-01
	MID	SX	-2.28611E-02	SY	-8.85206E-02	SXY	-1.92180E-01	TMAX	1.94964E-01	S1	1.39273E-01	S2	-2.50655E-01	SI	3.89928E-01
	-T/2	SX	1.01182E-01	SY	-4.10658E-02	SXY	-1.70163E-01	TMAX	1.84429E-01	S1	2.14487E-01	S2	-1.54370E-01	SI	3.68857E-01
40	+T/2	SX	-4.40230E-02	SY	-5.24919E-02	SXY	1.12398E-01	TMAX	1.12478E-01	S1	6.42202E-02	S2	-1.60735E-01	SI	2.24955E-01
	MID	SX	2.41281E-01	SY	-9.22292E-03	SXY	1.01887E-01	TMAX	1.61459E-01	S1	2.77488E-01	S2	-4.54296E-02	SI	3.22917E-01
	-T/2	SX	5.26585E-01	SY	3.40460E-02	SXY	9.13752E-02	TMAX	2.62675E-01	S1	5.42990E-01	S2	1.76407E-02	SI	5.42990E-01
41	+T/2	SX	-3.07433E-01	SY	-2.19125E-01	SXY	1.77150E-01	TMAX	1.82570E-01	S1	-8.07092E-02	S2	-4.45849E-01	SI	4.45849E-01
	MID	SX	-2.27975E-02	SY	-1.07174E-01	SXY	2.19378E-01	TMAX	2.23397E-01	S1	1.58412E-01	S2	-2.88383E-01	SI	4.46795E-01
	-T/2	SX	2.61838E-01	SY	4.77745E-03	SXY	2.61605E-01	TMAX	2.91474E-01	S1	4.24782E-01	S2	-1.58166E-01	SI	5.82948E-01
42	+T/2	SX	-4.63649E-01	SY	-4.33738E-01	SXY	1.72271E-01	TMAX	1.72918E-01	S1	-2.75775E-01	S2	-6.21612E-01	SI	6.21612E-01
	MID	SX	-1.88393E-01	SY	-2.40690E-01	SXY	2.85434E-01	TMAX	2.86630E-01	S1	7.20882E-02	S2	-5.01171E-01	SI	5.73259E-01
	-T/2	SX	8.68634E-02	SY	-4.76422E-02	SXY	3.98598E-01	TMAX	4.04232E-01	S1	4.23842E-01	S2	-3.84621E-01	SI	8.08463E-01
43	+T/2	SX	-5.72897E-01	SY	-6.27377E-01	SXY	1.28504E-01	TMAX	1.31360E-01	S1	-4.68777E-01	S2	-7.31496E-01	SI	7.31496E-01
	MID	SX	-3.63627E-01	SY	-3.39701E-01	SXY	3.06136E-01	TMAX	3.06370E-01	S1	-4.52941E-02	S2	-6.58034E-01	SI	6.58034E-01
	-T/2	SX	-1.54358E-01	SY	-5.20256E-02	SXY	4.83768E-01	TMAX	4.86467E-01	S1	3.83275E-01	S2	-5.89658E-01	SI	9.72933E-01

PAGE - 37

44	+T/2	SX	-6.83741E-01	SY	-7.03191E-01	SXY	1.60720E-01	TMAX	1.61014E-01	S1	-5.32451E-01	S2	-8.54480E-01	SI	8.54480E-01
	MID	SX	-5.65590E-01	SY	-3.09677E-01	SXY	2.21136E-01	TMAX	2.55488E-01	S1	-1.82146E-01	S2	-6.93121E-01	SI	6.93121E-01
	-T/2	SX	-4.47440E-01	SY	8.38368E-02	SXY	2.81551E-01	TMAX	3.87085E-01	S1	2.05284E-01	S2	-5.68887E-01	SI	7.74170E-01
45	+T/2	SX	-5.96651E-01	SY	-6.56419E-01	SXY	-1.68791E-01	TMAX	1.71416E-01	S1	-4.55119E-01	S2	-7.97951E-01	SI	7.97951E-01
	MID	SX	-5.89931E-01	SY	-3.93542E-01	SXY	-2.53593E-01	TMAX	2.71940E-01	S1	-2.19796E-01	S2	-7.63677E-01	SI	7.63677E-01
	-T/2	SX	-5.83210E-01	SY	-1.30665E-01	SXY	-3.38395E-01	TMAX	4.07075E-01	S1	5.01379E-02	S2	-7.64013E-01	SI	8.14151E-01
46	+T/2	SX	-6.40852E-01	SY	-6.85558E-01	SXY	-1.70398E-01	TMAX	1.71858E-01	S1	-4.91347E-01	S2	-8.35063E-01	SI	8.35063E-01
	MID	SX	-3.75393E-01	SY	-3.44711E-01	SXY	-3.25765E-01	TMAX	3.26126E-01	S1	-3.39267E-02	S2	-6.86178E-01	SI	6.86178E-01
	-T/2	SX	-1.09935E-01	SY	-3.86417E-03	SXY	-4.81131E-01	TMAX	4.84046E-01	S1	4.27146E-01	S2	-5.40945E-01	SI	9.68091E-01
47	+T/2	SX	-5.03176E-01	SY	-4.61623E-01	SXY	-2.12199E-01	TMAX	2.13213E-01	S1	-2.69186E-01	S2	-6.95613E-01	SI	6.95613E-01
	MID	SX	-2.09549E-01	SY	-2.50175E-01	SXY	-3.13635E-01	TMAX	3.14292E-01	S1	8.44304E-02	S2	-5.44154E-01	SI	6.28584E-01
	-T/2	SX	8.40783E-02	SY	-3.87257E-02	SXY	-4.15071E-01	TMAX	4.19588E-01	S1	4.42265E-01	S2	-3.96912E-01	SI	8.39177E-01
48	+T/2	SX	-3.27741E-01	SY	-2.49403E-01	SXY	-2.13544E-01	TMAX	2.17107E-01	S1	-7.14651E-02	S2	-5.05679E-01	SI	5.05679E-01
	MID	SX	-5.12456E-02	SY	-1.39412E-01	SXY	-2.55082E-01	TMAX	2.58863E-01	S1	1.63534E-01	S2	-3.54192E-01	SI	5.17726E-01
	-T/2	SX	2.25250E-01	SY	-2.94215E-02	SXY	-2.96619E-01	TMAX	3.22796E-01	S1	4.20710E-01	S2	-2.24882E-01	SI	6.45591E-01
49	+T/2	SX	-8.34057E-02	SY	-8.82141E-02	SXY	-1.29160E-01	TMAX	1.29183E-01	S1	4.33728E-02	S2	-2.14993E-01	SI	2.58365E-01
	MID	SX	1.84763E-01	SY	-4.85569E-02	SXY	-1.27822E-01	TMAX	1.73055E-01	S1	2.41158E-01	S2	-1.04952E-01	SI	3.46110E-01
	-T/2	SX	4.52933E-01	SY	-8.89975E-03	SXY	-1.26483E-01	TMAX	2.63288E-01	S1	4.85304E-01	S2	-4.12711E-02	SI	5.26575E-01
50	+T/2	SX	-2.98448E-02	SY	-6.05396E-02	SXY	4.42328E-02	TMAX	4.68197E-02	S1	1.62748E-03	S2	-9.20118E-02	SI	9.36393E-02
	MID	SX	3.46058E-01	SY	-2.20139E-02	SXY	3.87558E-02	TMAX	1.88073E-01	S1	3.50095E-01	S2	-2.60503E-02	SI	3.76145E-01
	-T/2	SX	7.21962E-01	SY	1.65118E-02	SXY	3.32788E-02	TMAX	3.54291E-01	S1	7.23528E-01	S2	1.49454E-02	SI	7.23528E-01
51	+T/2	SX	-3.80122E-01	SY	-2.53701E-01	SXY	6.75569E-02	TMAX	9.25176E-02	S1	-2.24394E-01	S2	-4.09429E-01	SI	4.09429E-01
	MID	SX	4.91038E-02	SY	-1.45446E-01	SXY	7.77001E-02	TMAX	1.24498E-01	S1	7.63266E-02	S2	-1.72669E-01	SI	2.48996E-01
	-T/2	SX	4.78330E-01	SY	-3.71913E-02	SXY	8.78433E-02	TMAX	2.72318E-01	S1	4.92887E-01	S2	-5.17485E-02	SI	5.44635E-01
52	+T/2	SX	-7.07877E-01	SY	-5.49294E-01	SXY	6.98702E-02	TMAX	1.05683E-01	S1	-5.22902E-01	S2	-7.34269E-01	SI	7.34269E-01
	MID	SX	-1.34504E-01	SY	-3.33733E-01	SXY	1.17078E-01	TMAX	1.53721E-01	S1	-8.03977E-02	S2	-3.87839E-01	SI	3.87839E-01
	-T/2	SX	4.38868E-01	SY	-1.18171E-01	SXY	1.64285E-01	TMAX	3.23361E-01	S1	4.83710E-01	S2	-1.63013E-01	SI	6.46723E-01
53	+T/2	SX	-1.14762E+00	SY	-9.24848E-01	SXY	8.43049E-03	TMAX	1.11705E-01	S1	-9.24528E-01	S2	-1.14794E+00	SI	1.14794E+00
	MID	SX	-3.32924E-01	SY	-5.57489E-01	SXY	1.69208E-01	TMAX	2.03073E-01	S1	-2.42133E-01	S2	-6.48280E-01	SI	6.48280E-01
	-T/2	SX	4.81773E-01	SY	-1.90131E-01	SXY	3.29986E-01	TMAX	4.70908E-01	S1	6.16729E-01	S2	-3.25086E-01	SI	9.41816E-01
54	+T/2	SX	-1.69099E+00	SY	-1.45205E+00	SXY	-1.95598E-01	TMAX	2.29197E-01	S1	-1.34233E+00	S2	-1.80072E+00	SI	1.80072E+00
	MID	SX	-7.99585E-01	SY	-7.84319E-01	SXY	2.44328E-01	TMAX	2.44447E-01	S1	-5.47505E-01	S2	-1.03640E+00	SI	1.03640E+00
	-T/2	SX	9.18230E-02	SY	-1.16584E-01	SXY	6.84253E-01	TMAX	6.92142E-01	S1	6.79761E-01	S2	-7.04522E-01	SI	1.38428E+00
55	+T/2	SX	-2.42574E+00	SY	-2.05823E+00	SXY	1.26676E-01	TMAX	2.23188E-01	S1	-2.01879E+00	S2	-2.46517E+00	SI	2.46517E+00
	MID	SX	-8.52837E-01	SY	-8.45134E-01	SXY	-2.65514E-01	TMAX	2.65542E-01	S1	-5.83443E-01	S2	-1.11453E+00	SI	1.11453E+00
	-T/2	SX	7.20065E-01	SY	3.67959E-01	SXY	-6.57705E-01	TMAX	6.80860E-01	S1	1.22487E+00	S2	-1.36848E-01	SI	1.36172E+00
56	+T/2	SX	-1.18294E+00	SY	-9.92656E-01	SXY	-1.79010E-02	TMAX	9.68093E-02	S1	-9.90986E-01	S2	-1.18460E+00	SI	1.18460E+00
	MID	SX	-3.93163E-01	SY	-5.69441E-01	SXY	-2.05934E-01	TMAX	2.24003E-01	S1	-2.57299E-01	S2	-7.05305E-01	SI	7.05305E-01

	-T/2	SX	3.96611E-01	SY	-1.46225E-01	SXY	-3.93967E-01	TMAX	4.78412E-01	S1	6.03605E-01	S2	-3.53219E-01	SI	9.56824E-01
57	+T/2	SX	-6.91088E-01	SY	-5.39058E-01	SXY	-8.18104E-02	TMAX	1.11675E-01	S1	-5.03398E-01	S2	-7.26747E-01	SI	7.26747E-01
	MID	SX	-1.69631E-01	SY	-3.42827E-01	SXY	-1.56984E-01	TMAX	1.79285E-01	S1	-7.69438E-02	S2	-4.35514E-01	SI	4.35514E-01
	-T/2	SX	3.51827E-01	SY	-1.46597E-01	SXY	-2.32157E-01	TMAX	3.40593E-01	S1	4.43208E-01	S2	-2.37978E-01	SI	6.81186E-01
58	+T/2	SX	-3.80498E-01	SY	-2.57047E-01	SXY	-8.35075E-02	TMAX	1.03844E-01	S1	-2.14929E-01	S2	-4.22616E-01	SI	4.22616E-01
	MID	SX	2.61798E-02	SY	-1.58579E-01	SXY	-1.13975E-01	TMAX	1.46711E-01	S1	8.05115E-02	S2	-2.12911E-01	SI	2.93422E-01
	-T/2	SX	4.32857E-01	SY	-6.01111E-02	SXY	-1.44441E-01	TMAX	2.85688E-01	S1	4.72061E-01	S2	-9.93152E-02	SI	5.71376E-01
59	+T/2	SX	-4.19632E-02	SY	-7.21970E-02	SXY	-4.62337E-02	TMAX	4.86423E-02	S1	-8.43775E-03	S2	-1.05722E-01	SI	1.05722E-01
	MID	SX	3.20820E-01	SY	-3.61742E-02	SXY	-5.29931E-02	TMAX	1.86197E-01	S1	3.28520E-01	S2	-4.38745E-02	SI	3.72395E-01
	-T/2	SX	6.83603E-01	SY	-1.51405E-04	SXY	-5.97525E-02	TMAX	3.47060E-01	S1	6.88785E-01	S2	-5.33384E-03	SI	6.94119E-01
60	+T/2	SX	-4.19631E-02	SY	-7.21967E-02	SXY	-4.62336E-02	TMAX	4.86422E-02	S1	-8.43769E-03	S2	-1.05722E-01	SI	1.05722E-01
	MID	SX	3.20820E-01	SY	-3.61742E-02	SXY	-5.29931E-02	TMAX	1.86197E-01	S1	3.28520E-01	S2	-4.38744E-02	SI	3.72395E-01
	-T/2	SX	6.83603E-01	SY	-1.51568E-04	SXY	-5.97526E-02	TMAX	3.47060E-01	S1	6.88785E-01	S2	-5.33396E-03	SI	6.94119E-01
61	+T/2	SX	-3.80498E-01	SY	-2.57046E-01	SXY	-8.35074E-02	TMAX	1.03844E-01	S1	-2.14928E-01	S2	-4.22616E-01	SI	4.22616E-01
	MID	SX	2.61797E-02	SY	-1.58579E-01	SXY	-1.13975E-01	TMAX	1.46711E-01	S1	8.05114E-02	S2	-2.12911E-01	SI	2.93422E-01
	-T/2	SX	4.32857E-01	SY	-6.01117E-02	SXY	-1.44442E-01	TMAX	2.85689E-01	S1	4.72061E-01	S2	-9.93158E-02	SI	5.71377E-01
62	+T/2	SX	-6.91088E-01	SY	-5.39056E-01	SXY	-8.18101E-02	TMAX	1.11675E-01	S1	-5.03397E-01	S2	-7.26747E-01	SI	7.26747E-01
	MID	SX	-1.69631E-01	SY	-3.42827E-01	SXY	-1.56984E-01	TMAX	1.79285E-01	S1	-7.69441E-02	S2	-4.35514E-01	SI	4.35514E-01
	-T/2	SX	3.51826E-01	SY	-1.46598E-01	SXY	-2.32157E-01	TMAX	3.40593E-01	S1	4.43207E-01	S2	-2.37979E-01	SI	6.81187E-01
63	+T/2	SX	-1.18294E+00	SY	-9.92658E-01	SXY	-1.79003E-02	TMAX	9.68086E-02	S1	-9.90989E-01	S2	-1.18461E+00	SI	1.18461E+00
	MID	SX	-3.93162E-01	SY	-5.69440E-01	SXY	-2.05934E-01	TMAX	2.24003E-01	S1	-2.57298E-01	S2	-7.05304E-01	SI	7.05304E-01
	-T/2	SX	3.96613E-01	SY	-1.46222E-01	SXY	-3.93967E-01	TMAX	4.78412E-01	S1	6.03607E-01	S2	-3.53216E-01	SI	9.56823E-01
64	+T/2	SX	-2.42574E+00	SY	-2.05823E+00	SXY	1.26675E-01	TMAX	2.23186E-01	S1	-2.01880E+00	S2	-2.46517E+00	SI	2.46517E+00
	MID	SX	-8.52836E-01	SY	-8.45134E-01	SXY	-2.65515E-01	TMAX	2.65543E-01	S1	-5.83442E-01	S2	-1.11453E+00	SI	1.11453E+00
	-T/2	SX	7.20066E-01	SY	3.67961E-01	SXY	-6.57704E-01	TMAX	6.80859E-01	S1	1.22487E+00	S2	-1.36846E-01	SI	1.36172E+00
65	+T/2	SX	-1.69099E+00	SY	-1.45205E+00	SXY	-1.95599E-01	TMAX	2.29199E-01	S1	-1.34232E+00	S2	-1.80072E+00	SI	1.80072E+00
	MID	SX	-7.99586E-01	SY	-7.84320E-01	SXY	2.44327E-01	TMAX	2.44446E-01	S1	-5.47507E-01	S2	-1.03640E+00	SI	1.03640E+00
	-T/2	SX	9.18207E-02	SY	-1.16588E-01	SXY	6.84253E-01	TMAX	6.92142E-01	S1	6.79758E-01	S2	-7.04525E-01	SI	1.38428E+00
66	+T/2	SX	-1.14762E+00	SY	-9.24846E-01	SXY	8.43118E-03	TMAX	1.11706E-01	S1	-9.24527E-01	S2	-1.14794E+00	SI	1.14794E+00
	MID	SX	-3.32925E-01	SY	-5.57490E-01	SXY	1.69208E-01	TMAX	2.03074E-01	S1	-2.42134E-01	S2	-6.48281E-01	SI	6.48281E-01
	-T/2	SX	4.81772E-01	SY	-1.90133E-01	SXY	3.29986E-01	TMAX	4.70908E-01	S1	6.16727E-01	S2	-3.25089E-01	SI	9.41816E-01
67	+T/2	SX	-7.07876E-01	SY	-5.49295E-01	SXY	6.98704E-02	TMAX	1.05683E-01	S1	-5.22903E-01	S2	-7.34269E-01	SI	7.34269E-01
	MID	SX	-1.34504E-01	SY	-3.33733E-01	SXY	1.17078E-01	TMAX	1.53721E-01	S1	-8.03975E-02	S2	-3.87840E-01	SI	3.87840E-01
	-T/2	SX	4.38868E-01	SY	-1.18170E-01	SXY	1.64285E-01	TMAX	3.23361E-01	S1	4.83710E-01	S2	-1.63013E-01	SI	6.46722E-01
68	+T/2	SX	-3.80122E-01	SY	-2.53702E-01	SXY	6.75570E-02	TMAX	9.25174E-02	S1	-2.24395E-01	S2	-4.09429E-01	SI	4.09429E-01
	MID	SX	4.91038E-02	SY	-1.45446E-01	SXY	7.77001E-02	TMAX	1.24498E-01	S1	7.63267E-02	S2	-1.72669E-01	SI	2.48996E-01
	-T/2	SX	4.78330E-01	SY	-3.71907E-02	SXY	8.78433E-02	TMAX	2.72317E-01	S1	4.92887E-01	S2	-5.17479E-02	SI	5.44635E-01

69	+T/2	SX	-2.98450E-02	SY	-6.05398E-02	SXY	4.42329E-02	TMAX	4.68197E-02	S1	1.62733E-03	S2	-9.20122E-02	SI	9.36395E-02
	MID	SX	3.46058E-01	SY	-2.20139E-02	SXY	3.87558E-02	TMAX	1.88073E-01	S1	3.50095E-01	S2	-2.60503E-02	SI	3.76145E-01
	-T/2	SX	7.21962E-01	SY	1.65120E-02	SXY	3.32787E-02	TMAX	3.54291E-01	S1	7.23528E-01	S2	1.49457E-02	SI	7.23528E-01
70	+T/2	SX	-8.34056E-02	SY	-8.82140E-02	SXY	-1.29160E-01	TMAX	1.29182E-01	S1	4.33726E-02	S2	-2.14992E-01	SI	2.58365E-01
	MID	SX	1.84763E-01	SY	-4.85569E-02	SXY	-1.27822E-01	TMAX	1.73055E-01	S1	2.41158E-01	S2	-1.04952E-01	SI	3.46110E-01
	-T/2	SX	4.52933E-01	SY	-8.89986E-03	SXY	-1.26484E-01	TMAX	2.63288E-01	S1	4.85304E-01	S2	-4.12713E-02	SI	5.26575E-01
71	+T/2	SX	-3.27741E-01	SY	-2.49402E-01	SXY	-2.13544E-01	TMAX	2.17106E-01	S1	-7.14650E-02	S2	-5.05678E-01	SI	5.05678E-01
	MID	SX	-5.12456E-02	SY	-1.39412E-01	SXY	-2.55081E-01	TMAX	2.58863E-01	S1	1.63534E-01	S2	-3.54191E-01	SI	5.17725E-01
	-T/2	SX	2.25249E-01	SY	-2.94223E-02	SXY	-2.96619E-01	TMAX	3.22796E-01	S1	4.20709E-01	S2	-2.24882E-01	SI	6.45592E-01
72	+T/2	SX	-5.03176E-01	SY	-4.61622E-01	SXY	-2.12198E-01	TMAX	2.13213E-01	S1	-2.69186E-01	S2	-6.95612E-01	SI	6.95612E-01
	MID	SX	-2.09549E-01	SY	-2.50174E-01	SXY	-3.13635E-01	TMAX	3.14292E-01	S1	8.44303E-02	S2	-5.44154E-01	SI	6.28584E-01
	-T/2	SX	8.40783E-02	SY	-3.87267E-02	SXY	-4.15072E-01	TMAX	4.19589E-01	S1	4.42264E-01	S2	-3.96913E-01	SI	8.39177E-01
73	+T/2	SX	-6.40853E-01	SY	-6.85559E-01	SXY	-1.70397E-01	TMAX	1.71857E-01	S1	-4.91349E-01	S2	-8.35063E-01	SI	8.35063E-01
	MID	SX	-3.75393E-01	SY	-3.44711E-01	SXY	-3.25764E-01	TMAX	3.26125E-01	S1	-3.39267E-02	S2	-6.86177E-01	SI	6.86177E-01
	-T/2	SX	-1.09933E-01	SY	-3.86224E-03	SXY	-4.81131E-01	TMAX	4.84045E-01	S1	4.27148E-01	S2	-5.40943E-01	SI	9.68091E-01
74	+T/2	SX	-5.96651E-01	SY	-6.56421E-01	SXY	-1.68793E-01	TMAX	1.71418E-01	S1	-4.55119E-01	S2	-7.97954E-01	SI	7.97954E-01
	MID	SX	-5.89931E-01	SY	-3.93542E-01	SXY	-2.53594E-01	TMAX	2.71941E-01	S1	-2.19795E-01	S2	-7.63677E-01	SI	7.63677E-01
	-T/2	SX	-5.83210E-01	SY	-1.30663E-01	SXY	-3.38395E-01	TMAX	4.07076E-01	S1	5.01395E-02	S2	-7.64012E-01	SI	8.14151E-01
75	+T/2	SX	-6.83741E-01	SY	-7.03189E-01	SXY	1.60719E-01	TMAX	1.61013E-01	S1	-5.32451E-01	S2	-8.54477E-01	SI	8.54477E-01
	MID	SX	-5.65591E-01	SY	-3.09677E-01	SXY	2.21135E-01	TMAX	2.55487E-01	S1	-1.82147E-01	S2	-6.93121E-01	SI	6.93121E-01
	-T/2	SX	-4.47441E-01	SY	8.38344E-02	SXY	2.81552E-01	TMAX	3.87085E-01	S1	2.05282E-01	S2	-5.68888E-01	SI	7.74170E-01
76	+T/2	SX	-5.72897E-01	SY	-6.27375E-01	SXY	1.28505E-01	TMAX	1.31360E-01	S1	-4.68775E-01	S2	-7.31496E-01	SI	7.31496E-01
	MID	SX	-3.63628E-01	SY	-3.39701E-01	SXY	3.06137E-01	TMAX	3.06370E-01	S1	-4.52942E-02	S2	-6.58035E-01	SI	6.58035E-01
	-T/2	SX	-1.54359E-01	SY	-5.20271E-02	SXY	4.83768E-01	TMAX	4.86467E-01	S1	3.83274E-01	S2	-5.89660E-01	SI	9.72933E-01
77	+T/2	SX	-4.63648E-01	SY	-4.33739E-01	SXY	1.72271E-01	TMAX	1.72919E-01	S1	-2.75775E-01	S2	-6.21612E-01	SI	6.21612E-01
	MID	SX	-1.88393E-01	SY	-2.40690E-01	SXY	2.85434E-01	TMAX	2.86630E-01	S1	7.20883E-02	S2	-5.01171E-01	SI	5.73259E-01
	-T/2	SX	8.68632E-02	SY	-4.76415E-02	SXY	3.98598E-01	TMAX	4.04232E-01	S1	4.23842E-01	S2	-3.84621E-01	SI	8.08463E-01
78	+T/2	SX	-3.07434E-01	SY	-2.19126E-01	SXY	1.77151E-01	TMAX	1.82570E-01	S1	-8.07095E-02	S2	-4.45850E-01	SI	4.45850E-01
	MID	SX	-2.27975E-02	SY	-1.07174E-01	SXY	2.19378E-01	TMAX	2.23397E-01	S1	1.58412E-01	S2	-2.88383E-01	SI	4.46795E-01
	-T/2	SX	2.61838E-01	SY	4.77809E-03	SXY	2.61604E-01	TMAX	2.91474E-01	S1	4.24782E-01	S2	-1.58165E-01	SI	5.82947E-01
79	+T/2	SX	-4.40233E-02	SY	-5.24921E-02	SXY	1.12398E-01	TMAX	1.12478E-01	S1	6.42202E-02	S2	-1.60736E-01	SI	2.24956E-01
	MID	SX	2.41281E-01	SY	-9.22292E-03	SXY	1.01887E-01	TMAX	1.61459E-01	S1	2.77488E-01	S2	-4.54297E-02	SI	3.22917E-01
	-T/2	SX	5.26585E-01	SY	3.40463E-02	SXY	9.13749E-02	TMAX	2.62675E-01	S1	5.42990E-01	S2	1.76410E-02	SI	5.42990E-01
80	+T/2	SX	-1.46904E-01	SY	-1.35975E-01	SXY	-2.14197E-01	TMAX	2.14267E-01	S1	7.28273E-02	S2	-3.55707E-01	SI	4.28534E-01
	MID	SX	-2.28611E-02	SY	-8.85206E-02	SXY	-1.92180E-01	TMAX	1.94964E-01	S1	1.39273E-01	S2	-2.50655E-01	SI	3.89928E-01
	-T/2	SX	1.01182E-01	SY	-4.10658E-02	SXY	-1.70163E-01	TMAX	1.84429E-01	S1	2.14487E-01	S2	-1.54371E-01	SI	3.68858E-01
81	+T/2	SX	-2.64336E-01	SY	-2.86806E-01	SXY	-3.19121E-01	TMAX	3.19319E-01	S1	4.37481E-02	S2	-5.94890E-01	SI	6.38638E-01
	MID	SX	-1.44981E-01	SY	-1.61477E-01	SXY	-3.41498E-01	TMAX	3.41597E-01	S1	1.88368E-01	S2	-4.94826E-01	SI	6.83194E-01

	-T/2	SX	-2.56271E-02	SY	-3.61479E-02	SXY	-3.63874E-01	TMAX	3.63912E-01	S1	3.33024E-01	S2	-3.94799E-01	SI	7.27823E-01
82	+T/2	SX	-3.17822E-01	SY	-4.09908E-01	SXY	-3.11487E-01	TMAX	3.14871E-01	S1	-4.89941E-02	S2	-6.78737E-01	SI	6.78737E-01
	MID	SX	-2.17231E-01	SY	-2.02073E-01	SXY	-3.69975E-01	TMAX	3.70052E-01	S1	1.60400E-01	S2	-5.79704E-01	SI	7.40104E-01
	-T/2	SX	-1.16639E-01	SY	5.76164E-03	SXY	-4.28462E-01	TMAX	4.32811E-01	S1	3.77372E-01	S2	-4.88249E-01	SI	8.65622E-01
83	+T/2	SX	-3.24336E-01	SY	-4.52494E-01	SXY	-2.60628E-01	TMAX	2.68390E-01	S1	-1.20025E-01	S2	-6.56805E-01	SI	6.56805E-01
	MID	SX	-2.91689E-01	SY	-1.99933E-01	SXY	-3.18313E-01	TMAX	3.21602E-01	S1	7.57909E-02	S2	-5.67413E-01	SI	6.43204E-01
	-T/2	SX	-2.59042E-01	SY	5.26274E-02	SXY	-3.75998E-01	TMAX	4.07012E-01	S1	3.03805E-01	S2	-5.10219E-01	SI	8.14024E-01
84	+T/2	SX	-2.52042E-01	SY	-3.06000E-01	SXY	-1.61816E-01	TMAX	1.64049E-01	S1	-1.14972E-01	S2	-4.43070E-01	SI	4.43070E-01
	MID	SX	-3.40217E-01	SY	-1.55211E-01	SXY	-1.72328E-01	TMAX	1.95586E-01	S1	-5.21278E-02	S2	-4.43300E-01	SI	4.43300E-01
	-T/2	SX	-4.28391E-01	SY	-4.42241E-03	SXY	-1.82841E-01	TMAX	2.79943E-01	S1	6.35366E-02	S2	-4.96350E-01	SI	5.59886E-01
85	+T/2	SX	-2.85177E-01	SY	-2.98948E-01	SXY	1.43305E-01	TMAX	1.43470E-01	S1	-1.48593E-01	S2	-4.35533E-01	SI	4.35533E-01
	MID	SX	-3.29284E-01	SY	-1.08930E-01	SXY	1.33394E-01	TMAX	1.73011E-01	S1	-4.60957E-02	S2	-3.92118E-01	SI	3.92118E-01
	-T/2	SX	-3.73390E-01	SY	8.10884E-02	SXY	1.23483E-01	TMAX	2.58623E-01	S1	1.12472E-01	S2	-4.04773E-01	SI	5.17245E-01
86	+T/2	SX	-3.12272E-01	SY	-4.41345E-01	SXY	2.29635E-01	TMAX	2.38532E-01	S1	-1.38277E-01	S2	-6.15340E-01	SI	6.15340E-01
	MID	SX	-2.87141E-01	SY	-1.85012E-01	SXY	2.92614E-01	TMAX	2.97036E-01	S1	6.09592E-02	S2	-5.33112E-01	SI	5.94072E-01
	-T/2	SX	-2.62010E-01	SY	7.13201E-02	SXY	3.55592E-01	TMAX	3.92712E-01	S1	2.97367E-01	S2	-4.88057E-01	SI	7.85424E-01
87	+T/2	SX	-2.99622E-01	SY	-3.94856E-01	SXY	2.95853E-01	TMAX	2.99661E-01	S1	-4.75782E-02	S2	-6.46900E-01	SI	6.46900E-01
	MID	SX	-2.16598E-01	SY	-1.97295E-01	SXY	3.56679E-01	TMAX	3.56810E-01	S1	1.49864E-01	S2	-5.63756E-01	SI	7.13620E-01
	-T/2	SX	-1.33574E-01	SY	2.66830E-04	SXY	4.17505E-01	TMAX	4.22834E-01	S1	3.56181E-01	S2	-4.89488E-01	SI	8.45669E-01
88	+T/2	SX	-2.48426E-01	SY	-2.40619E-01	SXY	2.97691E-01	TMAX	2.97717E-01	S1	5.31943E-02	S2	-5.42239E-01	SI	5.95434E-01
	MID	SX	-1.37544E-01	SY	-1.15627E-01	SXY	3.19436E-01	TMAX	3.19624E-01	S1	1.93039E-01	S2	-4.46210E-01	SI	6.39248E-01
	-T/2	SX	-2.66623E-02	SY	9.36584E-03	SXY	3.41181E-01	TMAX	3.41656E-01	S1	3.33008E-01	S2	-3.50304E-01	SI	6.83312E-01
89	+T/2	SX	-8.12806E-02	SY	-6.64754E-02	SXY	1.84075E-01	TMAX	1.84224E-01	S1	1.10346E-01	S2	-2.58102E-01	SI	3.68448E-01
	MID	SX	4.70623E-02	SY	-1.05220E-02	SXY	1.48636E-01	TMAX	1.51399E-01	S1	1.69669E-01	S2	-1.33129E-01	SI	3.02799E-01
	-T/2	SX	1.75405E-01	SY	4.54313E-02	SXY	1.13198E-01	TMAX	1.30526E-01	S1	2.40944E-01	S2	-2.01077E-02	SI	2.61052E-01
90	+T/2	SX	-2.02607E-01	SY	-2.85589E-01	SXY	-3.49415E-01	TMAX	3.51870E-01	S1	1.07772E-01	S2	-5.95968E-01	SI	7.03740E-01
	MID	SX	-2.83161E-01	SY	-2.49083E-01	SXY	-3.11693E-01	TMAX	3.12159E-01	S1	4.60365E-02	S2	-5.78281E-01	SI	6.24317E-01
	-T/2	SX	-3.63715E-01	SY	-2.12578E-01	SXY	-2.73971E-01	TMAX	2.84202E-01	S1	-3.94446E-03	S2	-5.72348E-01	SI	5.72348E-01
91	+T/2	SX	-2.07782E-01	SY	-4.33879E-01	SXY	-3.90145E-01	TMAX	4.06193E-01	S1	8.53631E-02	S2	-7.27024E-01	SI	8.12387E-01
	MID	SX	-2.23712E-01	SY	-3.03789E-01	SXY	-4.00476E-01	TMAX	4.02472E-01	S1	1.38722E-01	S2	-6.66223E-01	SI	8.04945E-01
	-T/2	SX	-2.39642E-01	SY	-1.73699E-01	SXY	-4.10806E-01	TMAX	4.12127E-01	S1	2.05457E-01	S2	-6.18798E-01	SI	8.24255E-01
92	+T/2	SX	-1.83508E-01	SY	-4.40479E-01	SXY	-3.38364E-01	TMAX	3.61937E-01	S1	4.99437E-02	S2	-6.73931E-01	SI	7.23874E-01
	MID	SX	-1.86514E-01	SY	-2.53663E-01	SXY	-3.60890E-01	TMAX	3.62449E-01	S1	1.42360E-01	S2	-5.82537E-01	SI	7.24898E-01
	-T/2	SX	-1.89520E-01	SY	-6.68467E-02	SXY	-3.83417E-01	TMAX	3.88292E-01	S1	2.60109E-01	S2	-5.16475E-01	SI	7.76584E-01
93	+T/2	SX	-1.47982E-01	SY	-3.64480E-01	SXY	-2.51424E-01	TMAX	2.73737E-01	S1	1.75059E-02	S2	-5.29968E-01	SI	5.47474E-01
	MID	SX	-1.79786E-01	SY	-1.65859E-01	SXY	-2.59400E-01	TMAX	2.59493E-01	S1	8.66708E-02	S2	-4.32315E-01	SI	5.18986E-01
	-T/2	SX	-2.11590E-01	SY	3.27626E-02	SXY	-2.67375E-01	TMAX	2.93967E-01	S1	2.04553E-01	S2	-3.83380E-01	SI	5.87934E-01

94	+T/2	SX	-7.41969E-02	SY	-2.14075E-01	SXY	-1.13962E-01	TMAX	1.33712E-01	S1	-1.04241E-02	S2	-2.77848E-01	SI	2.77848E-01
	MID	SX	-1.50162E-01	SY	-7.42558E-02	SXY	-1.07252E-01	TMAX	1.13770E-01	S1	1.56081E-03	S2	-2.25978E-01	SI	2.27539E-01
	-T/2	SX	-2.26127E-01	SY	6.55634E-02	SXY	-1.00543E-01	TMAX	1.77143E-01	S1	9.68612E-02	S2	-2.57424E-01	SI	3.54286E-01
95	+T/2	SX	-5.68046E-02	SY	-1.92442E-01	SXY	7.97459E-02	TMAX	1.04684E-01	S1	-1.99390E-02	S2	-2.29307E-01	SI	2.29307E-01
	MID	SX	-1.37969E-01	SY	-5.68422E-02	SXY	6.97864E-02	TMAX	8.07188E-02	S1	-1.66866E-02	S2	-1.78124E-01	SI	1.78124E-01
	-T/2	SX	-2.19133E-01	SY	7.87572E-02	SXY	5.98270E-02	TMAX	1.60511E-01	S1	9.03235E-02	S2	-2.30699E-01	SI	3.21022E-01
96	+T/2	SX	-1.12500E-01	SY	-3.53013E-01	SXY	2.12372E-01	TMAX	2.44057E-01	S1	1.12999E-02	S2	-4.76813E-01	SI	4.88113E-01
	MID	SX	-1.49599E-01	SY	-1.40700E-01	SXY	2.24344E-01	TMAX	2.24388E-01	S1	7.92382E-02	S2	-3.69537E-01	SI	4.48776E-01
	-T/2	SX	-1.86698E-01	SY	7.16125E-02	SXY	2.36315E-01	TMAX	2.69306E-01	S1	2.11764E-01	S2	-3.26849E-01	SI	5.38613E-01
97	+T/2	SX	-1.25796E-01	SY	-4.31623E-01	SXY	3.15357E-01	TMAX	3.50475E-01	S1	7.17655E-02	S2	-6.29184E-01	SI	7.00950E-01
	MID	SX	-1.48230E-01	SY	-2.43699E-01	SXY	3.41583E-01	TMAX	3.44902E-01	S1	1.48938E-01	S2	-5.40867E-01	SI	6.89804E-01
	-T/2	SX	-1.70665E-01	SY	-5.57740E-02	SXY	3.67809E-01	TMAX	3.72268E-01	S1	2.59049E-01	S2	-4.85487E-01	SI	7.44536E-01
98	+T/2	SX	-2.10198E-01	SY	-4.39109E-01	SXY	4.05460E-01	TMAX	4.21305E-01	S1	9.66520E-02	S2	-7.45958E-01	SI	8.42610E-01
	MID	SX	-2.45682E-01	SY	-3.12890E-01	SXY	4.16558E-01	TMAX	4.17911E-01	S1	1.38625E-01	S2	-6.97197E-01	SI	8.35822E-01
	-T/2	SX	-2.81166E-01	SY	-1.86672E-01	SXY	4.27655E-01	TMAX	4.30257E-01	S1	1.96338E-01	S2	-6.64176E-01	SI	8.60514E-01
99	+T/2	SX	-1.75221E-01	SY	-1.64851E-01	SXY	2.90088E-01	TMAX	2.90134E-01	S1	1.20097E-01	S2	-4.60170E-01	SI	5.80268E-01
	MID	SX	-2.35668E-01	SY	-8.59267E-02	SXY	2.43841E-01	TMAX	2.55076E-01	S1	9.42792E-02	S2	-4.15873E-01	SI	5.10153E-01
	-T/2	SX	-2.96114E-01	SY	-7.00201E-03	SXY	1.97594E-01	TMAX	2.44826E-01	S1	9.32683E-02	S2	-3.96384E-01	SI	4.89652E-01
100	+T/2	SX	-1.51069E-01	SY	-1.02240E+00	SXY	-6.39465E-01	TMAX	7.73770E-01	S1	1.87036E-01	S2	-1.36050E+00	SI	1.54754E+00
	MID	SX	-6.05257E-01	SY	-1.08396E+00	SXY	-6.77186E-01	TMAX	7.18240E-01	S1	-1.26366E-01	S2	-1.56285E+00	SI	1.56285E+00
	-T/2	SX	-1.05944E+00	SY	-1.14551E+00	SXY	-7.14907E-01	TMAX	7.16201E-01	S1	-3.86277E-01	S2	-1.81868E+00	SI	1.81868E+00
101	+T/2	SX	-1.59318E-01	SY	-7.97121E-01	SXY	-3.50544E-01	TMAX	4.73898E-01	S1	-4.32122E-03	S2	-9.52117E-01	SI	9.52117E-01
	MID	SX	-2.31899E-01	SY	-6.96654E-01	SXY	-3.91603E-01	TMAX	4.55360E-01	S1	-8.91662E-03	S2	-9.19636E-01	SI	9.19636E-01
	-T/2	SX	-3.04480E-01	SY	-5.96188E-01	SXY	-4.32663E-01	TMAX	4.56586E-01	S1	6.25181E-03	S2	-9.06919E-01	SI	9.13171E-01
102	+T/2	SX	-9.20997E-02	SY	-5.40956E-01	SXY	-2.28717E-01	TMAX	3.20436E-01	S1	3.90834E-03	S2	-6.36964E-01	SI	6.40873E-01
	MID	SX	-1.15803E-01	SY	-3.82917E-01	SXY	-2.42943E-01	TMAX	2.77234E-01	S1	2.78733E-02	S2	-5.26594E-01	SI	5.54467E-01
	-T/2	SX	-1.39507E-01	SY	-2.24878E-01	SXY	-2.57168E-01	TMAX	2.60687E-01	S1	7.84939E-02	S2	-4.42879E-01	SI	5.21373E-01
103	+T/2	SX	-4.38335E-02	SY	-3.21397E-01	SXY	-1.42624E-01	TMAX	1.99003E-01	S1	1.63873E-02	S2	-3.81618E-01	SI	3.98005E-01
	MID	SX	-6.64689E-02	SY	-1.49486E-01	SXY	-1.33645E-01	TMAX	1.39943E-01	S1	3.19654E-02	S2	-2.47920E-01	SI	2.79885E-01
	-T/2	SX	-8.91042E-02	SY	2.24257E-02	SXY	-1.24666E-01	TMAX	1.36570E-01	S1	1.03231E-01	S2	-1.69909E-01	SI	2.73140E-01
104	+T/2	SX	1.32716E-02	SY	-1.66779E-01	SXY	-4.85901E-02	TMAX	1.02301E-01	S1	2.55476E-02	S2	-1.79055E-01	SI	2.04602E-01
	MID	SX	-2.96773E-02	SY	-1.29156E-02	SXY	-2.54987E-02	TMAX	2.68407E-02	S1	5.54425E-03	S2	-4.81371E-02	SI	5.36814E-02
	-T/2	SX	-7.26261E-02	SY	1.40948E-01	SXY	-2.40738E-03	TMAX	1.06814E-01	S1	1.40975E-01	S2	-7.26532E-02	SI	2.13628E-01
105	+T/2	SX	2.80477E-03	SY	-1.74689E-01	SXY	3.31496E-02	TMAX	9.47362E-02	S1	8.79383E-03	S2	-1.80678E-01	SI	1.89472E-01
	MID	SX	-2.23815E-02	SY	-6.18597E-03	SXY	1.11159E-02	TMAX	1.37527E-02	S1	-5.31003E-04	S2	-2.80365E-02	SI	2.80365E-02
	-T/2	SX	-4.75678E-02	SY	1.62318E-01	SXY	-1.09177E-02	TMAX	1.05509E-01	S1	1.62884E-01	S2	-4.81341E-02	SI	2.11018E-01
106	+T/2	SX	3.12964E-04	SY	-2.78975E-01	SXY	1.07609E-01	TMAX	1.76296E-01	S1	3.69646E-02	S2	-3.15627E-01	SI	3.52591E-01
	MID	SX	-2.11225E-02	SY	-9.46811E-02	SXY	1.06326E-01	TMAX	1.12507E-01	S1	5.46054E-02	S2	-1.70409E-01	SI	2.25014E-01

	-T/2	SX	-4.25580E-02	SY	8.96130E-02	SXY	1.05042E-01	TMAX	1.24101E-01	S1	1.47629E-01	S2	-1.00574E-01	SI	2.48203E-01
107	+T/2	SX	2.24025E-02	SY	-4.67383E-01	SXY	1.66858E-01	TMAX	2.96334E-01	S1	7.38438E-02	S2	-5.18824E-01	SI	5.92668E-01
	MID	SX	-9.30734E-03	SY	-2.99942E-01	SXY	1.99223E-01	TMAX	2.46591E-01	S1	9.19661E-02	S2	-4.01216E-01	SI	4.93182E-01
	-T/2	SX	-4.10172E-02	SY	-1.32502E-01	SXY	2.31589E-01	TMAX	2.36063E-01	S1	1.49304E-01	S2	-3.22822E-01	SI	4.72126E-01
108	+T/2	SX	8.82537E-02	SY	-6.88824E-01	SXY	2.44450E-01	TMAX	4.59041E-01	S1	1.58755E-01	S2	-7.59326E-01	SI	9.18081E-01
	MID	SX	-4.24819E-02	SY	-6.05964E-01	SXY	3.25133E-01	TMAX	4.30220E-01	S1	1.05997E-01	S2	-7.54443E-01	SI	8.60440E-01
	-T/2	SX	-1.73217E-01	SY	-5.23104E-01	SXY	4.05816E-01	TMAX	4.41918E-01	S1	9.37573E-02	S2	-7.90078E-01	SI	8.83835E-01
109	+T/2	SX	-4.41171E-01	SY	-1.18024E+00	SXY	6.22131E-01	TMAX	7.23604E-01	S1	-8.71019E-02	S2	-1.53431E+00	SI	1.53431E+00
	MID	SX	-7.96083E-01	SY	-1.11304E+00	SXY	6.84327E-01	TMAX	7.02437E-01	S1	-2.52122E-01	S2	-1.65700E+00	SI	1.65700E+00
	-T/2	SX	-1.15099E+00	SY	-1.04583E+00	SXY	7.46523E-01	TMAX	7.48373E-01	S1	-3.50039E-01	S2	-1.84678E+00	SI	1.84678E+00

LOADING - 2

/-ELEMENT-//----------/

10	+T/2	SX	7.12567E+00	SY	2.26492E+00	SXY	-7.02801E-01	TMAX	2.52995E+00	S1	7.22524E+00	S2	2.16534E+00	SI	7.22524E+00
	MID	SX	2.16548E+00	SY	3.95818E+00	SXY	-2.11226E+00	TMAX	2.29458E+00	S1	5.35641E+00	S2	7.67254E-01	SI	5.35641E+00
	-T/2	SX	-2.79471E+00	SY	5.65145E+00	SXY	-3.52172E+00	TMAX	5.49881E+00	S1	6.92718E+00	S2	-4.07044E+00	SI	1.09976E+01
11	+T/2	SX	1.58000E+00	SY	3.46157E-01	SXY	-2.26954E-01	TMAX	6.57341E-01	S1	1.62042E+00	S2	3.05736E-01	SI	1.62042E+00
	MID	SX	1.13431E-01	SY	2.38852E+00	SXY	-9.42434E-01	TMAX	1.47723E+00	S1	2.72820E+00	S2	-2.26249E-01	SI	2.95445E+00
	-T/2	SX	-1.35314E+00	SY	4.43089E+00	SXY	-1.65791E+00	TMAX	3.33353E+00	S1	4.87241E+00	S2	-1.79465E+00	SI	6.66706E+00
12	+T/2	SX	-8.50307E-02	SY	-1.20894E+00	SXY	4.96349E-01	TMAX	7.49769E-01	S1	1.02785E-01	S2	-1.39675E+00	SI	1.49954E+00
	MID	SX	9.10894E-03	SY	1.41308E+00	SXY	-5.10778E-01	TMAX	8.68145E-01	S1	1.57924E+00	S2	-1.57052E-01	SI	1.73629E+00
	-T/2	SX	1.03249E-01	SY	4.03509E+00	SXY	-1.51790E+00	TMAX	2.48372E+00	S1	4.55289E+00	S2	-4.14553E-01	SI	4.96745E+00
13	+T/2	SX	-2.31528E-01	SY	-8.71279E-01	SXY	6.33836E-01	TMAX	7.09978E-01	S1	1.58575E-01	S2	-1.26138E+00	SI	1.41996E+00
	MID	SX	-1.21905E-03	SY	6.71612E-01	SXY	-3.02872E-01	TMAX	4.52667E-01	S1	7.87863E-01	S2	-1.17470E-01	SI	9.05333E-01
	-T/2	SX	2.29089E-01	SY	2.21450E+00	SXY	-1.23958E+00	TMAX	1.58809E+00	S1	2.80988E+00	S2	-3.66292E-01	SI	3.17618E+00
14	+T/2	SX	5.82019E-02	SY	6.21393E-01	SXY	5.71238E-01	TMAX	6.36874E-01	S1	9.76671E-01	S2	-2.97076E-01	SI	1.27375E+00
	MID	SX	-3.57588E-02	SY	6.03842E-02	SXY	-2.09247E-01	TMAX	2.14697E-01	S1	2.27010E-01	S2	-2.02385E-01	SI	4.29395E-01
	-T/2	SX	-1.29719E-01	SY	-5.00624E-01	SXY	-9.89731E-01	TMAX	1.00696E+00	S1	6.91783E-01	S2	-1.32213E+00	SI	2.01391E+00
15	+T/2	SX	2.14040E-01	SY	1.52512E+00	SXY	9.91179E-02	TMAX	6.62989E-01	S1	1.53257E+00	S2	2.06589E-01	SI	1.53257E+00
	MID	SX	-7.42212E-02	SY	-4.00889E-01	SXY	-2.66497E-01	TMAX	3.12568E-01	S1	7.50130E-02	S2	-5.50123E-01	SI	6.25136E-01
	-T/2	SX	-3.62483E-01	SY	-2.32689E+00	SXY	-6.32113E-01	TMAX	1.16803E+00	S1	-1.76658E-01	S2	-2.51272E+00	SI	2.51272E+00
16	+T/2	SX	7.48054E-02	SY	1.11483E+00	SXY	1.70204E-02	TMAX	5.20290E-01	S1	1.11511E+00	S2	7.45273E-02	SI	1.11511E+00
	MID	SX	-1.01482E-01	SY	-7.13295E-01	SXY	-2.96543E-01	TMAX	4.26047E-01	S1	1.86589E-02	S2	-8.33436E-01	SI	8.52095E-01
	-T/2	SX	-2.77769E-01	SY	-2.54142E+00	SXY	-6.10106E-01	TMAX	1.28579E+00	S1	-1.23803E-01	S2	-2.69538E+00	SI	2.69538E+00
17	+T/2	SX	-1.41362E-01	SY	3.39959E-01	SXY	-5.99524E-02	TMAX	2.48016E-01	S1	3.47314E-01	S2	-1.48717E-01	SI	4.96031E-01

	MID	SX	-1.88262E-01	SY	-1.07546E+00	SXY	-3.99634E-01	TMAX	5.97067E-01	S1	-3.47958E-02	S2	-1.22893E+00	SI	1.22893E+00
	-T/2	SX	-2.35162E-01	SY	-2.49089E+00	SXY	-7.39317E-01	TMAX	1.34858E+00	S1	-1.44472E-02	S2	-2.71160E+00	SI	2.71160E+00
18	+T/2	SX	-5.79736E-01	SY	-6.90114E-01	SXY	-2.95491E-01	TMAX	3.00601E-01	S1	-3.34324E-01	S2	-9.35525E-01	SI	9.35525E-01
	MID	SX	-3.58810E-01	SY	-1.52727E+00	SXY	-6.29667E-01	TMAX	8.58954E-01	S1	-8.40836E-02	S2	-1.80199E+00	SI	1.80199E+00
	-T/2	SX	-1.37884E-01	SY	-2.36442E+00	SXY	-9.63843E-01	TMAX	1.47253E+00	S1	2.21382E-01	S2	-2.72368E+00	SI	2.94507E+00
19	+T/2	SX	-2.46917E+00	SY	-2.27218E+00	SXY	-6.48903E-01	TMAX	6.56336E-01	S1	-1.71434E+00	S2	-3.02701E+00	SI	3.02701E+00
	MID	SX	-6.30620E-01	SY	-2.12176E+00	SXY	-1.06281E+00	TMAX	1.29824E+00	S1	-7.79467E-02	S2	-2.67443E+00	SI	2.67443E+00
	-T/2	SX	1.20794E+00	SY	-1.97134E+00	SXY	-1.47671E+00	TMAX	2.16971E+00	S1	1.78800E+00	S2	-2.55141E+00	SI	4.33941E+00
20	+T/2	SX	4.93205E-01	SY	-1.47484E+00	SXY	2.44988E+00	TMAX	2.64011E+00	S1	2.14930E+00	S2	-3.13093E+00	SI	5.28023E+00
	MID	SX	5.34816E-01	SY	2.75420E-01	SXY	-4.25624E-01	TMAX	4.44946E-01	S1	8.50064E-01	S2	-3.98279E-02	SI	8.89892E-01
	-T/2	SX	5.76427E-01	SY	2.02568E+00	SXY	-3.30113E+00	TMAX	3.37972E+00	S1	4.68078E+00	S2	-2.07867E+00	SI	6.75945E+00
21	+T/2	SX	4.62444E-01	SY	-1.59631E+00	SXY	1.01204E+00	TMAX	1.44355E+00	S1	8.76618E-01	S2	-2.01049E+00	SI	2.88711E+00
	MID	SX	7.91176E-01	SY	8.92662E-01	SXY	-9.08408E-01	TMAX	9.09824E-01	S1	1.75174E+00	S2	-6.79054E-02	SI	1.81965E+00
	-T/2	SX	1.11991E+00	SY	3.38164E+00	SXY	-2.82886E+00	TMAX	3.04652E+00	S1	5.29729E+00	S2	-7.95746E-01	SI	6.09304E+00
22	+T/2	SX	-1.77427E-01	SY	-1.89321E+00	SXY	7.45243E-01	TMAX	1.13638E+00	S1	1.01065E-01	S2	-2.17170E+00	SI	2.27276E+00
	MID	SX	3.71320E-01	SY	6.24041E-01	SXY	-7.16344E-01	TMAX	7.27403E-01	S1	1.22508E+00	S2	-2.29722E-01	SI	1.45480E+00
	-T/2	SX	9.20068E-01	SY	3.14129E+00	SXY	-2.17793E+00	TMAX	2.44476E+00	S1	4.47543E+00	S2	-4.14077E-01	SI	4.88951E+00
23	+T/2	SX	-2.04035E-01	SY	-1.06708E+00	SXY	5.88679E-01	TMAX	7.29900E-01	S1	9.43441E-02	S2	-1.36546E+00	SI	1.45980E+00
	MID	SX	1.70040E-01	SY	2.33788E-01	SXY	-5.42239E-01	TMAX	5.43174E-01	S1	7.45088E-01	S2	-3.41260E-01	SI	1.08635E+00
	-T/2	SX	5.44114E-01	SY	1.53465E+00	SXY	-1.67316E+00	TMAX	1.74492E+00	S1	2.78430E+00	S2	-7.05535E-01	SI	3.48984E+00
24	+T/2	SX	2.29179E-01	SY	8.27012E-01	SXY	4.06032E-01	TMAX	5.04195E-01	S1	1.03229E+00	S2	2.39005E-02	SI	1.03229E+00
	MID	SX	9.14123E-03	SY	-1.80352E-01	SXY	-4.46504E-01	TMAX	4.56445E-01	S1	3.70840E-01	S2	-5.42051E-01	SI	9.12891E-01
	-T/2	SX	-2.10897E-01	SY	-1.18772E+00	SXY	-1.29904E+00	TMAX	1.38782E+00	S1	6.88514E-01	S2	-2.08713E+00	SI	2.77564E+00
25	+T/2	SX	4.79919E-01	SY	1.80379E+00	SXY	6.67689E-02	TMAX	6.65295E-01	S1	1.80715E+00	S2	4.76560E-01	SI	1.80715E+00
	MID	SX	-9.57558E-02	SY	-5.15917E-01	SXY	-4.09424E-01	TMAX	4.60176E-01	S1	1.54340E-01	S2	-7.66012E-01	SI	9.20352E-01
	-T/2	SX	-6.71431E-01	SY	-2.83562E+00	SXY	-8.85617E-01	TMAX	1.39830E+00	S1	-3.55225E-01	S2	-3.15183E+00	SI	3.15183E+00
26	+T/2	SX	3.29191E-01	SY	1.36855E+00	SXY	-1.29778E-01	TMAX	5.35639E-01	S1	1.38451E+00	S2	3.13231E-01	SI	1.38451E+00
	MID	SX	-1.27876E-01	SY	-5.87617E-01	SXY	-4.44439E-01	TMAX	5.00366E-01	S1	1.42620E-01	S2	-8.58113E-01	SI	1.00073E+00
	-T/2	SX	-5.84942E-01	SY	-2.54378E+00	SXY	-7.59100E-01	TMAX	1.23915E+00	S1	-3.25211E-01	S2	-2.80351E+00	SI	2.80351E+00
27	+T/2	SX	9.70796E-02	SY	8.32137E-01	SXY	-1.60025E-01	TMAX	4.00856E-01	S1	8.65464E-01	S2	6.37525E-02	SI	8.65464E-01
	MID	SX	-2.19034E-01	SY	-6.40403E-01	SXY	-4.88947E-01	TMAX	5.32407E-01	S1	1.02688E-01	S2	-9.62125E-01	SI	1.06481E+00
	-T/2	SX	-5.35147E-01	SY	-2.11294E+00	SXY	-8.17868E-01	TMAX	1.13634E+00	S1	-1.87705E-01	S2	-2.46038E+00	SI	2.46038E+00
28	+T/2	SX	-1.87979E-01	SY	3.04233E-01	SXY	-7.14254E-02	TMAX	2.56261E-01	S1	3.14388E-01	S2	-1.98134E-01	SI	5.12522E-01
	MID	SX	-3.05663E-01	SY	-6.20883E-01	SXY	-5.03044E-01	TMAX	5.27157E-01	S1	6.38834E-02	S2	-9.90430E-01	SI	1.05431E+00
	-T/2	SX	-4.23348E-01	SY	-1.54600E+00	SXY	-9.34663E-01	TMAX	1.09027E+00	S1	1.05593E-01	S2	-2.07494E+00	SI	2.18053E+00
29	+T/2	SX	-4.15943E-01	SY	-1.37249E-01	SXY	2.96273E-01	TMAX	3.27407E-01	S1	5.08113E-02	S2	-6.04003E-01	SI	6.54814E-01
	MID	SX	-2.30516E-01	SY	-4.18499E-01	SXY	-3.55177E-01	TMAX	3.67403E-01	S1	4.28954E-02	S2	-6.91910E-01	SI	7.34805E-01
	-T/2	SX	-4.50890E-02	SY	-6.99749E-01	SXY	-1.00663E+00	TMAX	1.05851E+00	S1	6.86090E-01	S2	-1.43093E+00	SI	2.11702E+00

30	+T/2	SX	-2.33196E+00	SY	-1.37845E+00	SXY	2.33152E+00	TMAX	2.37976E+00	S1	5.24557E-01	S2	-4.23497E+00	SI	4.75952E+00
	MID	SX	3.81729E-02	SY	-4.43298E-02	SXY	-8.50028E-02	TMAX	9.44836E-02	S1	9.14051E-02	S2	-9.75621E-02	SI	1.88967E-01
	-T/2	SX	2.40830E+00	SY	1.28979E+00	SXY	-2.50152E+00	TMAX	2.56327E+00	S1	4.41232E+00	S2	-7.14228E-01	SI	5.12655E+00
31	+T/2	SX	-1.37334E+00	SY	-2.39837E+00	SXY	1.37406E+00	TMAX	1.46653E+00	S1	-4.19324E-01	S2	-3.35239E+00	SI	3.35239E+00
	MID	SX	5.12010E-01	SY	-3.64967E-02	SXY	-4.51713E-01	TMAX	5.28450E-01	S1	7.66207E-01	S2	-2.90693E-01	SI	1.05690E+00
	-T/2	SX	2.39736E+00	SY	2.32538E+00	SXY	-2.27749E+00	TMAX	2.27777E+00	S1	4.63914E+00	S2	8.35991E-02	SI	4.63914E+00
32	+T/2	SX	-9.22434E-01	SY	-2.30309E+00	SXY	8.65186E-01	TMAX	1.10684E+00	S1	-5.05921E-01	S2	-2.71961E+00	SI	2.71961E+00
	MID	SX	4.87632E-01	SY	2.63152E-03	SXY	-5.65331E-01	TMAX	6.15147E-01	S1	8.60278E-01	S2	-3.70015E-01	SI	1.23029E+00
	-T/2	SX	1.89770E+00	SY	2.30836E+00	SXY	-1.99585E+00	TMAX	2.00638E+00	S1	4.10941E+00	S2	9.66463E-02	SI	4.10941E+00
33	+T/2	SX	-4.19804E-01	SY	-1.18246E+00	SXY	5.85385E-01	TMAX	6.98633E-01	S1	-1.02500E-01	S2	-1.49977E+00	SI	1.49977E+00
	MID	SX	2.93513E-01	SY	-1.37559E-01	SXY	-5.18061E-01	TMAX	5.61109E-01	S1	6.39085E-01	S2	-4.83132E-01	SI	1.12222E+00
	-T/2	SX	1.00683E+00	SY	9.07345E-01	SXY	-1.62151E+00	TMAX	1.62227E+00	S1	2.57936E+00	S2	-6.65183E-01	SI	3.24454E+00
34	+T/2	SX	3.55441E-01	SY	1.10175E+00	SXY	3.44681E-01	TMAX	5.07986E-01	S1	1.23658E+00	S2	2.20611E-01	SI	1.23658E+00
	MID	SX	9.01276E-02	SY	-3.53258E-01	SXY	-4.58117E-01	TMAX	5.08939E-01	S1	3.77374E-01	S2	-6.40504E-01	SI	1.01788E+00
	-T/2	SX	-1.75186E-01	SY	-1.80827E+00	SXY	-1.26091E+00	TMAX	1.50221E+00	S1	5.10487E-01	S2	-2.49394E+00	SI	3.00443E+00
35	+T/2	SX	7.82020E-01	SY	2.21887E+00	SXY	5.36100E-02	TMAX	7.20421E-01	S1	2.22086E+00	S2	7.80023E-01	SI	2.22086E+00
	MID	SX	-6.55035E-02	SY	-5.42025E-01	SXY	-4.01565E-01	TMAX	4.66929E-01	S1	1.63165E-01	S2	-7.70693E-01	SI	9.33858E-01
	-T/2	SX	-9.13027E-01	SY	-3.30292E+00	SXY	-8.56740E-01	TMAX	1.47034E+00	S1	-6.37633E-01	S2	-3.57831E+00	SI	3.57831E+00
36	+T/2	SX	6.30190E-01	SY	1.63470E+00	SXY	-1.11397E-01	TMAX	5.14459E-01	S1	1.64690E+00	S2	6.17984E-01	SI	1.64690E+00
	MID	SX	-1.22882E-01	SY	-4.81728E-01	SXY	-3.99157E-01	TMAX	4.37628E-01	S1	1.35323E-01	S2	-7.39933E-01	SI	8.75257E-01
	-T/2	SX	-8.75955E-01	SY	-2.59815E+00	SXY	-6.86917E-01	TMAX	1.10152E+00	S1	-6.35534E-01	S2	-2.83857E+00	SI	2.83857E+00
37	+T/2	SX	4.72408E-01	SY	1.11401E+00	SXY	-1.02423E-01	TMAX	3.36757E-01	S1	1.12997E+00	S2	4.56454E-01	SI	1.12997E+00
	MID	SX	-1.80319E-01	SY	-3.92826E-01	SXY	-3.90082E-01	TMAX	4.04294E-01	S1	1.17721E-01	S2	-6.90867E-01	SI	8.08588E-01
	-T/2	SX	-8.33046E-01	SY	-1.89967E+00	SXY	-6.77740E-01	TMAX	8.62410E-01	S1	-5.03946E-01	S2	-2.22877E+00	SI	2.22877E+00
38	+T/2	SX	4.04608E-01	SY	6.33398E-01	SXY	5.48899E-02	TMAX	1.26882E-01	S1	6.45885E-01	S2	3.92120E-01	SI	6.45885E-01
	MID	SX	-1.75943E-01	SY	-2.68813E-01	SXY	-3.23407E-01	TMAX	3.26723E-01	S1	1.04345E-01	S2	-5.49101E-01	SI	6.53447E-01
	-T/2	SX	-7.56494E-01	SY	-1.17102E+00	SXY	-7.01704E-01	TMAX	7.31673E-01	S1	-2.32085E-01	S2	-1.69543E+00	SI	1.69543E+00
39	+T/2	SX	6.15126E-01	SY	2.19734E-01	SXY	3.69773E-01	TMAX	4.19304E-01	S1	8.36733E-01	S2	-1.87361E-03	SI	8.38607E-01
	MID	SX	2.08412E-02	SY	-1.08580E-01	SXY	-1.39912E-01	TMAX	1.54152E-01	S1	1.10283E-01	S2	-1.98022E-01	SI	3.08304E-01
	-T/2	SX	-5.73443E-01	SY	-4.36895E-01	SXY	-6.49597E-01	TMAX	6.53175E-01	S1	1.48006E-01	S2	-1.15834E+00	SI	1.30635E+00
40	+T/2	SX	-3.69178E+00	SY	-1.19926E+00	SXY	1.51933E+00	TMAX	1.96507E+00	S1	-4.80447E-01	S2	-4.41059E+00	SI	4.41059E+00
	MID	SX	-1.54650E-01	SY	-1.08155E-01	SXY	-1.09120E-02	TMAX	2.56811E-02	S1	-1.05721E-01	S2	-1.57083E-01	SI	1.57083E-01
	-T/2	SX	3.38248E+00	SY	9.82951E-01	SXY	-1.54115E+00	TMAX	1.95310E+00	S1	4.13581E+00	S2	2.29621E-01	SI	4.13581E+00
41	+T/2	SX	-2.50551E+00	SY	-2.45895E+00	SXY	1.04524E+00	TMAX	1.04550E+00	S1	-1.43673E+00	S2	-3.52774E+00	SI	3.52774E+00
	MID	SX	2.98409E-01	SY	-2.85113E-01	SXY	-1.98305E-01	TMAX	3.52774E-01	S1	3.59422E-01	S2	-3.46126E-01	SI	7.05547E-01
	-T/2	SX	3.10233E+00	SY	1.88873E+00	SXY	-1.44185E+00	TMAX	1.56434E+00	S1	4.05987E+00	S2	9.31195E-01	SI	4.05987E+00
42	+T/2	SX	-1.55518E+00	SY	-2.42795E+00	SXY	6.89470E-01	TMAX	8.15967E-01	S1	-1.17560E+00	S2	-2.80753E+00	SI	2.80753E+00

	MID	SX	4.19159E-01	SY	-3.29084E-01	SXY	-3.14619E-01	TMAX	4.88828E-01	S1	5.33865E-01	S2	-4.43790E-01	SI	9.77655E-01
	-T/2	SX	2.39350E+00	SY	1.76978E+00	SXY	-1.31871E+00	TMAX	1.35508E+00	S1	3.43672E+00	S2	7.26557E-01	SI	3.43672E+00
43	+T/2	SX	-6.32991E-01	SY	-1.18207E+00	SXY	4.52358E-01	TMAX	5.29149E-01	S1	-3.78379E-01	S2	-1.43668E+00	SI	1.43668E+00
	MID	SX	3.27795E-01	SY	-3.78463E-01	SXY	-3.40217E-01	TMAX	4.90355E-01	S1	4.65021E-01	S2	-5.15689E-01	SI	9.80709E-01
	-T/2	SX	1.28858E+00	SY	4.25139E-01	SXY	-1.13279E+00	TMAX	1.21227E+00	S1	2.06913E+00	S2	-3.55409E-01	SI	2.42454E+00
44	+T/2	SX	4.33468E-01	SY	1.35557E+00	SXY	2.61692E-01	TMAX	5.30141E-01	S1	1.42466E+00	S2	3.64377E-01	SI	1.42466E+00
	MID	SX	1.47655E-01	SY	-4.74994E-01	SXY	-3.20713E-01	TMAX	4.46967E-01	S1	2.83298E-01	S2	-6.10637E-01	SI	8.93935E-01
	-T/2	SX	-1.38159E-01	SY	-2.30556E+00	SXY	-9.03119E-01	TMAX	1.41068E+00	S1	1.88825E-01	S2	-2.63254E+00	SI	2.82136E+00
45	+T/2	SX	1.03016E+00	SY	2.54656E+00	SXY	5.11858E-02	TMAX	7.59925E-01	S1	2.54829E+00	S2	1.02844E+00	SI	2.54829E+00
	MID	SX	-2.48177E-02	SY	-5.70483E-01	SXY	-2.79306E-01	TMAX	3.90448E-01	S1	9.27977E-02	S2	-6.88098E-01	SI	7.80896E-01
	-T/2	SX	-1.07980E+00	SY	-3.68753E+00	SXY	-6.09799E-01	TMAX	1.43942E+00	S1	-9.44248E-01	S2	-3.82308E+00	SI	3.82308E+00
46	+T/2	SX	8.95017E-01	SY	1.83172E+00	SXY	-6.19783E-02	TMAX	4.72434E-01	S1	1.83580E+00	S2	8.90933E-01	SI	1.83580E+00
	MID	SX	-9.51777E-02	SY	-4.26739E-01	SXY	-2.64894E-01	TMAX	3.12493E-01	S1	5.15350E-02	S2	-5.73452E-01	SI	6.24987E-01
	-T/2	SX	-1.08537E+00	SY	-2.68520E+00	SXY	-4.67810E-01	TMAX	9.26664E-01	S1	-9.58621E-01	S2	-2.81195E+00	SI	2.81195E+00
47	+T/2	SX	8.04910E-01	SY	1.25752E+00	SXY	-5.18033E-02	TMAX	2.32161E-01	S1	1.26338E+00	S2	7.99056E-01	SI	1.26338E+00
	MID	SX	-1.26540E-01	SY	-2.79909E-01	SXY	-2.41905E-01	TMAX	2.53768E-01	S1	5.05443E-02	S2	-4.56993E-01	SI	5.07537E-01
	-T/2	SX	-1.05799E+00	SY	-1.81734E+00	SXY	-4.32006E-01	TMAX	5.75138E-01	S1	-8.62527E-01	S2	-2.01280E+00	SI	2.01280E+00
48	+T/2	SX	8.57209E-01	SY	7.48938E-01	SXY	5.70513E-02	TMAX	7.86481E-02	S1	8.81721E-01	S2	7.24425E-01	SI	8.81721E-01
	MID	SX	-6.48808E-02	SY	-1.39888E-01	SXY	-1.79977E-01	TMAX	1.83843E-01	S1	8.14585E-02	S2	-2.86227E-01	SI	3.67685E-01
	-T/2	SX	-9.86971E-01	SY	-1.02871E+00	SXY	-4.17005E-01	TMAX	4.17527E-01	S1	-5.90315E-01	S2	-1.42537E+00	SI	1.42537E+00
49	+T/2	SX	1.16879E+00	SY	2.76426E-01	SXY	2.43801E-01	TMAX	5.08444E-01	S1	1.23105E+00	S2	2.14162E-01	SI	1.23105E+00
	MID	SX	1.70696E-01	SY	-3.24547E-02	SXY	-6.04745E-02	TMAX	1.18215E-01	S1	1.87335E-01	S2	-4.90940E-02	SI	2.36429E-01
	-T/2	SX	-8.27395E-01	SY	-3.41336E-01	SXY	-3.64750E-01	TMAX	4.38299E-01	S1	-1.46066E-01	S2	-1.02266E+00	SI	1.02266E+00
50	+T/2	SX	-4.27608E+00	SY	-1.12853E+00	SXY	5.72921E-01	TMAX	1.67482E+00	S1	-1.02749E+00	S2	-4.37712E+00	SI	4.37712E+00
	MID	SX	-2.21240E-01	SY	-1.29808E-01	SXY	6.74638E-03	TMAX	4.62113E-02	S1	-1.29313E-01	S2	-2.21735E-01	SI	2.21735E-01
	-T/2	SX	3.83360E+00	SY	8.68912E-01	SXY	-5.59429E-01	TMAX	1.58439E+00	S1	3.93565E+00	S2	7.66863E-01	SI	3.93565E+00
51	+T/2	SX	-3.02319E+00	SY	-2.40461E+00	SXY	4.28901E-01	TMAX	5.28790E-01	S1	-2.18511E+00	S2	-3.24269E+00	SI	3.24269E+00
	MID	SX	1.97570E-01	SY	-3.41437E-01	SXY	-4.40537E-02	TMAX	2.73080E-01	S1	2.01146E-01	S2	-3.45014E-01	SI	5.46160E-01
	-T/2	SX	3.41833E+00	SY	1.72173E+00	SXY	-5.17008E-01	TMAX	9.93434E-01	S1	3.56347E+00	S2	1.57660E+00	SI	3.56347E+00
52	+T/2	SX	-1.88277E+00	SY	-2.42151E+00	SXY	2.99922E-01	TMAX	4.03128E-01	S1	-1.74901E+00	S2	-2.55527E+00	SI	2.55527E+00
	MID	SX	3.57915E-01	SY	-4.38251E-01	SXY	-8.76830E-02	TMAX	4.07625E-01	S1	3.67457E-01	S2	-4.47794E-01	SI	8.15251E-01
	-T/2	SX	2.59860E+00	SY	1.54501E+00	SXY	-4.75288E-01	TMAX	7.09516E-01	S1	2.78132E+00	S2	1.36229E+00	SI	2.78132E+00
53	+T/2	SX	-7.55958E-01	SY	-1.14735E+00	SXY	2.08136E-01	TMAX	2.85688E-01	S1	-6.65966E-01	S2	-1.23734E+00	SI	1.23734E+00
	MID	SX	3.19678E-01	SY	-4.87755E-01	SXY	-1.08036E-01	TMAX	4.17922E-01	S1	3.33884E-01	S2	-5.01961E-01	SI	8.35845E-01
	-T/2	SX	1.39531E+00	SY	1.71840E-01	SXY	-4.24209E-01	TMAX	7.44429E-01	S1	1.52801E+00	S2	3.91479E-02	SI	1.52801E+00
54	+T/2	SX	4.92072E-01	SY	1.51793E+00	SXY	1.32017E-01	TMAX	5.29645E-01	S1	1.53465E+00	S2	4.75356E-01	SI	1.53465E+00
	MID	SX	1.72791E-01	SY	-5.40364E-01	SXY	-1.07982E-01	TMAX	3.72569E-01	S1	1.88783E-01	S2	-5.56355E-01	SI	7.45138E-01
	-T/2	SX	-1.46489E-01	SY	-2.59866E+00	SXY	-3.47980E-01	TMAX	1.27451E+00	S1	-9.80654E-02	S2	-2.64708E+00	SI	2.64708E+00

55	+T/2	SX	1.17838E+00	SY	2.73319E+00	SXY	4.02080E-02	TMAX	7.78444E-01	S1	2.73423E+00	S2	1.17734E+00	SI	2.73423E+00
	MID	SX	1.19765E-03	SY	-5.96287E-01	SXY	-9.21775E-02	TMAX	3.12640E-01	S1	1.50952E-02	S2	-6.10185E-01	SI	6.25280E-01
	-T/2	SX	-1.17599E+00	SY	-3.92577E+00	SXY	-2.24563E-01	TMAX	1.39311E+00	S1	-1.15777E+00	S2	-3.94399E+00	SI	3.94399E+00
56	+T/2	SX	1.05172E+00	SY	1.93525E+00	SXY	-1.62796E-02	TMAX	4.42064E-01	S1	1.93555E+00	S2	1.05142E+00	SI	1.93555E+00
	MID	SX	-7.42462E-02	SY	-4.10177E-01	SXY	-8.70891E-02	TMAX	1.89201E-01	S1	-5.30110E-02	S2	-4.31412E-01	SI	4.31412E-01
	-T/2	SX	-1.20021E+00	SY	-2.75560E+00	SXY	-1.57898E-01	TMAX	7.93561E-01	S1	-1.18434E+00	S2	-2.77147E+00	SI	2.77147E+00
57	+T/2	SX	9.92102E-01	SY	1.32329E+00	SXY	-2.37914E-02	TMAX	1.67294E-01	S1	1.32499E+00	S2	9.90401E-01	SI	1.32499E+00
	MID	SX	-9.35535E-02	SY	-2.36834E-01	SXY	-7.99744E-02	TMAX	1.07370E-01	S1	-5.78242E-02	S2	-2.72563E-01	SI	2.72563E-01
	-T/2	SX	-1.17921E+00	SY	-1.79696E+00	SXY	-1.36157E-01	TMAX	3.37554E-01	S1	-1.15053E+00	S2	-1.82564E+00	SI	1.82564E+00
58	+T/2	SX	1.08960E+00	SY	7.93042E-01	SXY	5.58081E-03	TMAX	1.48383E-01	S1	1.08970E+00	S2	7.92937E-01	SI	1.08970E+00
	MID	SX	-5.73260E-03	SY	-9.47845E-02	SXY	-5.98259E-02	TMAX	7.45767E-02	S1	2.43182E-02	S2	-1.24835E-01	SI	1.49153E-01
	-T/2	SX	-1.10106E+00	SY	-9.82611E-01	SXY	-1.25233E-01	TMAX	1.38531E-01	S1	-9.03305E-01	S2	-1.18037E+00	SI	1.18037E+00
59	+T/2	SX	1.42564E+00	SY	2.87833E-01	SXY	6.34739E-02	TMAX	5.72435E-01	S1	1.42917E+00	S2	2.84303E-01	SI	1.42917E+00
	MID	SX	2.43269E-01	SY	-1.40841E-02	SXY	-1.97481E-02	TMAX	1.30183E-01	S1	2.44775E-01	S2	-1.55906E-02	SI	2.60366E-01
	-T/2	SX	-9.39108E-01	SY	-3.16001E-01	SXY	-1.02970E-01	TMAX	3.28129E-01	S1	-2.99426E-01	S2	-9.55683E-01	SI	9.55683E-01
60	+T/2	SX	-4.28575E+00	SY	-1.11475E+00	SXY	-3.87369E-01	TMAX	1.63213E+00	S1	-1.06811E+00	S2	-4.33238E+00	SI	4.33238E+00
	MID	SX	-2.10761E-01	SY	-1.32738E-01	SXY	1.96738E-02	TMAX	4.36917E-02	S1	-1.28058E-01	S2	-2.15442E-01	SI	2.15442E-01
	-T/2	SX	3.86423E+00	SY	8.49272E-01	SXY	4.26716E-01	TMAX	1.56671E+00	S1	3.92346E+00	S2	7.90042E-01	SI	3.92346E+00
61	+T/2	SX	-3.02734E+00	SY	-2.36147E+00	SXY	-2.68841E-01	TMAX	4.27928E-01	S1	-2.26648E+00	S2	-3.12233E+00	SI	3.12233E+00
	MID	SX	1.96302E-01	SY	-3.23713E-01	SXY	8.41256E-02	TMAX	2.73278E-01	S1	2.09572E-01	S2	-3.36984E-01	SI	5.46556E-01
	-T/2	SX	3.41995E+00	SY	1.71404E+00	SXY	4.37093E-01	TMAX	9.58424E-01	S1	3.52542E+00	S2	1.60857E+00	SI	3.52542E+00
62	+T/2	SX	-1.88250E+00	SY	-2.40026E+00	SXY	-1.71165E-01	TMAX	3.10349E-01	S1	-1.83103E+00	S2	-2.45172E+00	SI	2.45172E+00
	MID	SX	3.50532E-01	SY	-4.29390E-01	SXY	1.20062E-01	TMAX	4.08025E-01	S1	3.68596E-01	S2	-4.47454E-01	SI	8.16051E-01
	-T/2	SX	2.58356E+00	SY	1.54148E+00	SXY	4.11289E-01	TMAX	6.63810E-01	S1	2.72633E+00	S2	1.39871E+00	SI	2.72633E+00
63	+T/2	SX	-7.43731E-01	SY	-1.14426E+00	SXY	-9.06908E-02	TMAX	2.19844E-01	S1	-7.24153E-01	S2	-1.16384E+00	SI	1.16384E+00
	MID	SX	3.16994E-01	SY	-4.93896E-01	SXY	1.29416E-01	TMAX	4.25599E-01	S1	3.37148E-01	S2	-5.14050E-01	SI	8.51198E-01
	-T/2	SX	1.37772E+00	SY	1.56471E-01	SXY	3.49524E-01	TMAX	7.03582E-01	S1	1.47068E+00	S2	6.35123E-02	SI	1.47068E+00
64	+T/2	SX	5.25823E-01	SY	1.53422E+00	SXY	-2.09457E-02	TMAX	5.04631E-01	S1	1.53465E+00	S2	5.25388E-01	SI	1.53465E+00
	MID	SX	1.77971E-01	SY	-5.51129E-01	SXY	1.26365E-01	TMAX	3.85830E-01	S1	1.99252E-01	S2	-5.72409E-01	SI	7.71661E-01
	-T/2	SX	-1.69880E-01	SY	-2.63647E+00	SXY	2.73677E-01	TMAX	1.26330E+00	S1	-1.39879E-01	S2	-2.66647E+00	SI	2.66647E+00
65	+T/2	SX	1.20372E+00	SY	2.75014E+00	SXY	2.24076E-02	TMAX	7.73536E-01	S1	2.75046E+00	S2	1.20339E+00	SI	2.75046E+00
	MID	SX	6.13556E-03	SY	-6.11920E-01	SXY	1.14849E-01	TMAX	3.29679E-01	S1	2.67872E-02	S2	-6.32572E-01	SI	6.59359E-01
	-T/2	SX	-1.19145E+00	SY	-3.97398E+00	SXY	2.07291E-01	TMAX	1.40662E+00	S1	-1.17609E+00	S2	-3.98934E+00	SI	3.98934E+00
66	+T/2	SX	1.05881E+00	SY	1.93449E+00	SXY	2.99608E-02	TMAX	4.38868E-01	S1	1.93552E+00	S2	1.05778E+00	SI	1.93552E+00
	MID	SX	-7.46980E-02	SY	-4.19471E-01	SXY	1.07014E-01	TMAX	2.02902E-01	S1	-4.41830E-02	S2	-4.49986E-01	SI	4.49986E-01
	-T/2	SX	-1.20820E+00	SY	-2.77344E+00	SXY	1.84067E-01	TMAX	8.03971E-01	S1	-1.18685E+00	S2	-2.79479E+00	SI	2.79479E+00
67	+T/2	SX	9.88101E-01	SY	1.32857E+00	SXY	1.59630E-03	TMAX	1.70243E-01	S1	1.32858E+00	S2	9.88094E-01	SI	1.32858E+00

	MID	SX	-9.97873E-02	SY	-2.35027E-01	SXY	8.90733E-02	TMAX	1.11832E-01	S1	-5.55747E-02	S2	-2.79239E-01	SI	2.79239E-01
	-T/2	SX	-1.18768E+00	SY	-1.79863E+00	SXY	1.76550E-01	TMAX	3.52824E-01	S1	-1.14033E+00	S2	-1.84597E+00	SI	1.84597E+00
68	+T/2	SX	1.08373E+00	SY	8.08567E-01	SXY	-5.78053E-02	TMAX	1.49232E-01	S1	1.09538E+00	S2	7.96917E-01	SI	1.09538E+00
	MID	SX	-1.08359E-02	SY	-8.52133E-02	SXY	5.43076E-02	TMAX	6.58203E-02	S1	1.77957E-02	S2	-1.13845E-01	SI	1.31640E-01
	-T/2	SX	-1.10540E+00	SY	-9.78994E-01	SXY	1.66420E-01	TMAX	1.78018E-01	S1	-8.64179E-01	S2	-1.22021E+00	SI	1.22021E+00
69	+T/2	SX	1.42485E+00	SY	2.93020E-01	SXY	-1.31493E-01	TMAX	5.80992E-01	S1	1.43993E+00	S2	2.77945E-01	SI	1.43993E+00
	MID	SX	2.45796E-01	SY	-1.25877E-02	SXY	1.05666E-02	TMAX	1.29623E-01	S1	2.46227E-01	S2	-1.30190E-02	SI	2.59246E-01
	-T/2	SX	-9.33263E-01	SY	-3.18195E-01	SXY	1.52626E-01	TMAX	3.43324E-01	S1	-2.82405E-01	S2	-9.69053E-01	SI	9.69053E-01
70	+T/2	SX	-3.71645E+00	SY	-1.12772E+00	SXY	-1.30150E+00	TMAX	1.83556E+00	S1	-5.86520E-01	S2	-4.25764E+00	SI	4.25764E+00
	MID	SX	-1.29175E-01	SY	-1.01859E-01	SXY	5.48996E-02	TMAX	5.65730E-02	S1	-5.89442E-02	S2	-1.72090E-01	SI	1.72090E-01
	-T/2	SX	3.45809E+00	SY	9.24000E-01	SXY	1.41130E+00	TMAX	1.89662E+00	S1	4.08767E+00	S2	2.94423E-01	SI	4.08767E+00
71	+T/2	SX	-2.53197E+00	SY	-2.32456E+00	SXY	-9.08102E-01	TMAX	9.14004E-01	S1	-1.51426E+00	S2	-3.34227E+00	SI	3.34227E+00
	MID	SX	2.82238E-01	SY	-2.26321E-01	SXY	2.32570E-01	TMAX	3.44597E-01	S1	3.72555E-01	S2	-3.16638E-01	SI	6.89193E-01
	-T/2	SX	3.09644E+00	SY	1.87192E+00	SXY	1.37324E+00	TMAX	1.50355E+00	S1	3.98773E+00	S2	9.80635E-01	SI	3.98773E+00
72	+T/2	SX	-1.56812E+00	SY	-2.38336E+00	SXY	-5.96379E-01	TMAX	7.22373E-01	S1	-1.25337E+00	S2	-2.69811E+00	SI	2.69811E+00
	MID	SX	3.95664E-01	SY	-3.15570E-01	SXY	3.25716E-01	TMAX	4.82238E-01	S1	5.22285E-01	S2	-4.42192E-01	SI	9.64477E-01
	-T/2	SX	2.35945E+00	SY	1.75222E+00	SXY	1.24781E+00	TMAX	1.28421E+00	S1	3.34005E+00	S2	7.71619E-01	SI	3.34005E+00
73	+T/2	SX	-6.05424E-01	SY	-1.19101E+00	SXY	-3.66318E-01	TMAX	4.68954E-01	S1	-4.29265E-01	S2	-1.36717E+00	SI	1.36717E+00
	MID	SX	3.30266E-01	SY	-4.07318E-01	SXY	3.49834E-01	TMAX	5.08322E-01	S1	4.69796E-01	S2	-5.46848E-01	SI	1.01664E+00
	-T/2	SX	1.26596E+00	SY	3.76379E-01	SXY	1.06599E+00	TMAX	1.15506E+00	S1	1.97623E+00	S2	-3.33892E-01	SI	2.31012E+00
74	+T/2	SX	5.23525E-01	SY	1.38796E+00	SXY	-1.61788E-01	TMAX	4.61506E-01	S1	1.41725E+00	S2	4.94236E-01	SI	1.41725E+00
	MID	SX	1.71719E-01	SY	-5.09701E-01	SXY	3.40923E-01	TMAX	4.81987E-01	S1	3.12997E-01	S2	-6.50978E-01	SI	9.63975E-01
	-T/2	SX	-1.80086E-01	SY	-2.40736E+00	SXY	8.43635E-01	TMAX	1.39711E+00	S1	1.03383E-01	S2	-2.69083E+00	SI	2.79421E+00
75	+T/2	SX	1.09741E+00	SY	2.58656E+00	SXY	1.03162E-02	TMAX	7.44648E-01	S1	2.58663E+00	S2	1.09733E+00	SI	2.58663E+00
	MID	SX	-3.95373E-03	SY	-6.18011E-01	SXY	3.01219E-01	TMAX	4.30116E-01	S1	1.19133E-01	S2	-7.41098E-01	SI	8.60232E-01
	-T/2	SX	-1.10531E+00	SY	-3.82258E+00	SXY	5.92123E-01	TMAX	1.48206E+00	S1	-9.81889E-01	S2	-3.94600E+00	SI	3.94600E+00
76	+T/2	SX	9.10515E-01	SY	1.82083E+00	SXY	8.88256E-02	TMAX	4.63744E-01	S1	1.82942E+00	S2	9.01928E-01	SI	1.82942E+00
	MID	SX	-9.01212E-02	SY	-4.59743E-01	SXY	2.93617E-01	TMAX	3.46938E-01	S1	7.20056E-02	S2	-6.21869E-01	SI	6.93875E-01
	-T/2	SX	-1.09076E+00	SY	-2.74031E+00	SXY	4.98407E-01	TMAX	9.63675E-01	S1	-9.51859E-01	S2	-2.87921E+00	SI	2.87921E+00
77	+T/2	SX	7.85343E-01	SY	1.26424E+00	SXY	4.85622E-02	TMAX	2.44321E-01	S1	1.26911E+00	S2	7.80468E-01	SI	1.26911E+00
	MID	SX	-1.45882E-01	SY	-2.83543E-01	SXY	2.65731E-01	TMAX	2.74501E-01	S1	5.97883E-02	S2	-4.89213E-01	SI	5.49001E-01
	-T/2	SX	-1.07711E+00	SY	-1.83132E+00	SXY	4.82900E-01	TMAX	6.12701E-01	S1	-8.41513E-01	S2	-2.06691E+00	SI	2.06691E+00
78	+T/2	SX	8.30626E-01	SY	7.97902E-01	SXY	-9.89261E-02	TMAX	1.00270E-01	S1	9.14534E-01	S2	7.13994E-01	SI	9.14534E-01
	MID	SX	-8.73684E-02	SY	-1.10462E-01	SXY	1.80891E-01	TMAX	1.81259E-01	S1	8.23434E-02	S2	-2.80174E-01	SI	3.62517E-01
	-T/2	SX	-1.00536E+00	SY	-1.01883E+00	SXY	4.60707E-01	TMAX	4.60756E-01	S1	-5.51338E-01	S2	-1.47285E+00	SI	1.47285E+00
79	+T/2	SX	1.16476E+00	SY	3.04226E-01	SXY	-3.25933E-01	TMAX	5.39780E-01	S1	1.27427E+00	S2	1.94713E-01	SI	1.27427E+00
	MID	SX	1.74262E-01	SY	-2.05420E-02	SXY	4.25147E-02	TMAX	1.06276E-01	S1	1.83136E-01	S2	-2.94163E-02	SI	2.12552E-01
	-T/2	SX	-8.16237E-01	SY	-3.45310E-01	SXY	4.10963E-01	TMAX	4.73639E-01	S1	-1.07135E-01	S2	-1.05441E+00	SI	1.05441E+00

80	+T/2	SX	-2.32051E+00	SY	-1.09529E+00	SXY	-2.04520E+00	TMAX	2.13498E+00	S1	4.27080E-01	S2	-3.84288E+00	SI	4.26996E+00
	MID	SX	4.75358E-02	SY	4.09166E-02	SXY	1.72111E-01	TMAX	1.72142E-01	S1	2.16369E-01	S2	-1.27916E-01	SI	3.44285E-01
	-T/2	SX	2.41558E+00	SY	1.17712E+00	SXY	2.38942E+00	TMAX	2.46836E+00	S1	4.26471E+00	S2	-6.72003E-01	SI	4.93671E+00
81	+T/2	SX	-1.48146E+00	SY	-2.20490E+00	SXY	-1.31031E+00	TMAX	1.35932E+00	S1	-4.83863E-01	S2	-3.20250E+00	SI	3.20250E+00
	MID	SX	4.37948E-01	SY	4.75955E-02	SXY	4.49037E-01	TMAX	4.89620E-01	S1	7.32392E-01	S2	-2.46849E-01	SI	9.79241E-01
	-T/2	SX	2.35736E+00	SY	2.30009E+00	SXY	2.20838E+00	TMAX	2.20857E+00	S1	4.53729E+00	S2	1.20156E-01	SI	4.53729E+00
82	+T/2	SX	-9.89542E-01	SY	-2.29591E+00	SXY	-8.40624E-01	TMAX	1.06456E+00	S1	-5.78161E-01	S2	-2.70729E+00	SI	2.70729E+00
	MID	SX	4.62434E-01	SY	-3.12187E-02	SXY	5.32977E-01	TMAX	5.87357E-01	S1	8.02964E-01	S2	-3.71749E-01	SI	1.17471E+00
	-T/2	SX	1.91441E+00	SY	2.23347E+00	SXY	1.90658E+00	TMAX	1.91324E+00	S1	3.98718E+00	S2	1.60701E-01	SI	3.98718E+00
83	+T/2	SX	-3.90647E-01	SY	-1.22343E+00	SXY	-5.55193E-01	TMAX	6.93988E-01	S1	-1.13048E-01	S2	-1.50102E+00	SI	1.50102E+00
	MID	SX	3.41574E-01	SY	-1.94655E-01	SXY	5.19668E-01	TMAX	5.84756E-01	S1	6.58216E-01	S2	-5.11297E-01	SI	1.16951E+00
	-T/2	SX	1.07379E+00	SY	8.34116E-01	SXY	1.59453E+00	TMAX	1.59902E+00	S1	2.55298E+00	S2	-6.45070E-01	SI	3.19805E+00
84	+T/2	SX	4.61038E-01	SY	1.10925E+00	SXY	-2.77300E-01	TMAX	4.26543E-01	S1	1.21168E+00	S2	3.58599E-01	SI	1.21168E+00
	MID	SX	1.51199E-01	SY	-4.04618E-01	SXY	4.84597E-01	TMAX	5.58630E-01	S1	4.31920E-01	S2	-6.85339E-01	SI	1.11726E+00
	-T/2	SX	-1.58640E-01	SY	-1.91848E+00	SXY	1.24649E+00	TMAX	1.52578E+00	S1	4.87220E-01	S2	-2.56434E+00	SI	3.05156E+00
85	+T/2	SX	8.58493E-01	SY	2.26107E+00	SXY	8.75061E-03	TMAX	7.01341E-01	S1	2.26112E+00	S2	8.58438E-01	SI	2.26112E+00
	MID	SX	-1.67294E-02	SY	-6.09251E-01	SXY	4.22312E-01	TMAX	5.15866E-01	S1	2.02876E-01	S2	-8.28856E-01	SI	1.03173E+00
	-T/2	SX	-8.91951E-01	SY	-3.47956E+00	SXY	8.35874E-01	TMAX	1.54033E+00	S1	-6.45427E-01	S2	-3.72609E+00	SI	3.72609E+00
86	+T/2	SX	6.44450E-01	SY	1.60512E+00	SXY	1.52757E-01	TMAX	5.04039E-01	S1	1.62882E+00	S2	6.20744E-01	SI	1.62882E+00
	MID	SX	-8.91373E-02	SY	-5.39434E-01	SXY	4.34158E-01	TMAX	4.89066E-01	S1	1.74780E-01	S2	-8.03351E-01	SI	9.78131E-01
	-T/2	SX	-8.22725E-01	SY	-2.68399E+00	SXY	7.15560E-01	TMAX	1.17392E+00	S1	-5.79431E-01	S2	-2.92728E+00	SI	2.92728E+00
87	+T/2	SX	4.25011E-01	SY	1.08964E+00	SXY	1.31983E-01	TMAX	3.57566E-01	S1	1.11489E+00	S2	3.99761E-01	SI	1.11489E+00
	MID	SX	-2.02774E-01	SY	-4.37492E-01	SXY	4.41877E-01	TMAX	4.57196E-01	S1	1.37063E-01	S2	-7.77329E-01	SI	9.14392E-01
	-T/2	SX	-8.30559E-01	SY	-1.96463E+00	SXY	7.51771E-01	TMAX	9.41640E-01	S1	-4.55952E-01	S2	-2.33923E+00	SI	2.33923E+00
88	+T/2	SX	3.26916E-01	SY	6.98640E-01	SXY	-6.13864E-02	TMAX	1.95737E-01	S1	7.08515E-01	S2	3.17040E-01	SI	7.08515E-01
	MID	SX	-2.39547E-01	SY	-2.37333E-01	SXY	3.52764E-01	TMAX	3.52766E-01	S1	1.14326E-01	S2	-5.91206E-01	SI	7.05532E-01
	-T/2	SX	-8.06009E-01	SY	-1.17331E+00	SXY	7.66915E-01	TMAX	7.88597E-01	S1	-2.01060E-01	S2	-1.77825E+00	SI	1.77825E+00
89	+T/2	SX	6.07730E-01	SY	3.29020E-01	SXY	-4.82253E-01	TMAX	5.01984E-01	S1	9.70359E-01	S2	-3.36087E-02	SI	1.00397E+00
	MID	SX	5.14570E-03	SY	-5.16230E-02	SXY	1.02266E-01	TMAX	1.06132E-01	S1	8.28934E-02	S2	-1.29371E-01	SI	2.12264E-01
	-T/2	SX	-5.97439E-01	SY	-4.32266E-01	SXY	6.86785E-01	TMAX	6.91732E-01	S1	1.76880E-01	S2	-1.20658E+00	SI	1.38346E+00
90	+T/2	SX	7.81062E-01	SY	-3.67286E-01	SXY	-2.21745E+00	TMAX	2.29058E+00	S1	2.49747E+00	S2	-2.08370E+00	SI	4.58117E+00
	MID	SX	3.88734E-01	SY	6.28010E-01	SXY	5.62803E-01	TMAX	5.75378E-01	S1	1.08375E+00	S2	-6.70066E-02	SI	1.15076E+00
	-T/2	SX	-3.59500E-03	SY	1.62331E+00	SXY	3.34306E+00	TMAX	3.44060E+00	S1	4.25046E+00	S2	-2.63075E+00	SI	6.88120E+00
91	+T/2	SX	7.24987E-02	SY	-1.70249E+00	SXY	-1.15356E+00	TMAX	1.45546E+00	S1	6.40461E-01	S2	-2.27045E+00	SI	2.91091E+00
	MID	SX	6.12506E-01	SY	7.64688E-01	SXY	7.80655E-01	TMAX	7.84354E-01	S1	1.47295E+00	S2	-9.57575E-02	SI	1.56871E+00
	-T/2	SX	1.15251E+00	SY	3.23186E+00	SXY	2.71487E+00	TMAX	2.90714E+00	S1	5.09933E+00	S2	-7.14950E-01	SI	5.81428E+00
92	+T/2	SX	-3.17816E-01	SY	-1.92634E+00	SXY	-8.01144E-01	TMAX	1.13519E+00	S1	1.31178E-02	S2	-2.25727E+00	SI	2.27039E+00

	MID	SX	4.80576E-01	SY	5.60174E-01	SXY	6.99321E-01	TMAX	7.00452E-01	S1	1.22083E+00	S2	-1.80078E-01	SI	1.40090E+00
	-T/2	SX	1.27897E+00	SY	3.04669E+00	SXY	2.19979E+00	TMAX	2.37071E+00	S1	4.53354E+00	S2	-2.07882E-01	SI	4.74142E+00
93	+T/2	SX	-1.94000E-01	SY	-1.10255E+00	SXY	-6.49167E-01	TMAX	7.92327E-01	S1	1.44054E-01	S2	-1.44060E+00	SI	1.58465E+00
	MID	SX	3.07031E-01	SY	2.07828E-01	SXY	5.63649E-01	TMAX	5.65827E-01	S1	8.23257E-01	S2	-3.08398E-01	SI	1.13165E+00
	-T/2	SX	8.08062E-01	SY	1.51820E+00	SXY	1.77647E+00	TMAX	1.81160E+00	S1	2.97474E+00	S2	-6.48470E-01	SI	3.62321E+00
94	+T/2	SX	3.16138E-01	SY	7.84193E-01	SXY	-4.08708E-01	TMAX	4.70968E-01	S1	1.02113E+00	S2	7.91973E-02	SI	1.02113E+00
	MID	SX	1.08515E-01	SY	-2.05036E-01	SXY	4.75282E-01	TMAX	5.00471E-01	S1	4.52211E-01	S2	-5.48732E-01	SI	1.00094E+00
	-T/2	SX	-9.91088E-02	SY	-1.19426E+00	SXY	1.35927E+00	TMAX	1.46542E+00	S1	8.18735E-01	S2	-2.11211E+00	SI	2.93084E+00
95	+T/2	SX	5.14257E-01	SY	1.85163E+00	SXY	-2.64084E-03	TMAX	6.68690E-01	S1	1.85163E+00	S2	5.14253E-01	SI	1.85163E+00
	MID	SX	-1.80431E-02	SY	-5.53231E-01	SXY	4.28389E-01	TMAX	5.05098E-01	S1	2.19461E-01	S2	-7.90735E-01	SI	1.01020E+00
	-T/2	SX	-5.50344E-01	SY	-2.95809E+00	SXY	8.59419E-01	TMAX	1.47916E+00	S1	-2.75058E-01	S2	-3.23337E+00	SI	3.23337E+00
96	+T/2	SX	3.40335E-01	SY	1.35015E+00	SXY	1.69312E-01	TMAX	5.32539E-01	S1	1.37778E+00	S2	3.12704E-01	SI	1.37778E+00
	MID	SX	-3.99098E-02	SY	-6.38784E-01	SXY	4.61386E-01	TMAX	5.50036E-01	S1	2.10689E-01	S2	-8.89383E-01	SI	1.10007E+00
	-T/2	SX	-4.20155E-01	SY	-2.62772E+00	SXY	7.53460E-01	TMAX	1.33643E+00	S1	-1.87510E-01	S2	-2.86036E+00	SI	2.86036E+00
97	+T/2	SX	7.18525E-02	SY	7.85257E-01	SXY	1.97568E-01	TMAX	4.07762E-01	S1	8.36316E-01	S2	2.07928E-02	SI	8.36316E-01
	MID	SX	-1.57075E-01	SY	-7.23478E-01	SXY	5.31178E-01	TMAX	6.01958E-01	S1	1.61681E-01	S2	-1.04223E+00	SI	1.20391E+00
	-T/2	SX	-3.86002E-01	SY	-2.23221E+00	SXY	8.64788E-01	TMAX	1.26490E+00	S1	-4.42038E-02	S2	-2.57401E+00	SI	2.57401E+00
98	+T/2	SX	-3.76941E-01	SY	2.03792E-01	SXY	1.64264E-01	TMAX	3.33609E-01	S1	2.47034E-01	S2	-4.20183E-01	SI	6.67218E-01
	MID	SX	-4.32570E-01	SY	-7.43870E-01	SXY	6.15887E-01	TMAX	6.35251E-01	S1	4.70309E-02	S2	-1.22347E+00	SI	1.27050E+00
	-T/2	SX	-4.88199E-01	SY	-1.69153E+00	SXY	1.06751E+00	TMAX	1.22539E+00	S1	1.35524E-01	S2	-2.31525E+00	SI	2.45078E+00
99	+T/2	SX	-4.20948E-01	SY	2.51201E-01	SXY	-4.00670E-01	TMAX	5.22955E-01	S1	4.38081E-01	S2	-6.07829E-01	SI	1.04591E+00
	MID	SX	-3.52115E-01	SY	-2.29843E-01	SXY	3.05286E-01	TMAX	3.11348E-01	S1	2.03686E-02	S2	-6.02327E-01	SI	6.22695E-01
	-T/2	SX	-2.83282E-01	SY	-7.10887E-01	SXY	1.01124E+00	TMAX	1.03360E+00	S1	5.36512E-01	S2	-1.53068E+00	SI	2.06719E+00
100	+T/2	SX	7.95784E+00	SY	4.54521E+00	SXY	1.20418E-01	TMAX	1.71056E+00	S1	7.96208E+00	S2	4.54097E+00	SI	7.96208E+00
	MID	SX	1.02570E+00	SY	3.85791E+00	SXY	1.90775E+00	TMAX	2.37589E+00	S1	4.81769E+00	S2	6.59189E-02	SI	4.81769E+00
	-T/2	SX	-5.90643E+00	SY	3.17060E+00	SXY	3.69508E+00	TMAX	5.85249E+00	S1	4.48458E+00	S2	-7.22041E+00	SI	1.17050E+01
101	+T/2	SX	1.26446E+00	SY	2.76353E-01	SXY	-2.76516E-01	TMAX	5.66171E-01	S1	1.33658E+00	S2	2.04235E-01	SI	1.33658E+00
	MID	SX	6.54862E-01	SY	2.54409E+00	SXY	1.08871E+00	TMAX	1.44138E+00	S1	3.04086E+00	S2	1.58095E-01	SI	3.04086E+00
	-T/2	SX	4.52655E-02	SY	4.81183E+00	SXY	2.45393E+00	TMAX	3.42079E+00	S1	5.84934E+00	S2	-9.92242E-01	SI	6.84158E+00
102	+T/2	SX	1.30856E-01	SY	-1.02566E+00	SXY	-6.94526E-01	TMAX	9.03741E-01	S1	4.56340E-01	S2	-1.35114E+00	SI	1.80748E+00
	MID	SX	3.45865E-01	SY	1.54900E+00	SXY	6.06859E-01	TMAX	8.54495E-01	S1	1.80193E+00	S2	9.29384E-02	SI	1.80193E+00
	-T/2	SX	5.60875E-01	SY	4.12366E+00	SXY	1.90824E+00	TMAX	2.61051E+00	S1	4.95278E+00	S2	-2.68241E-01	SI	5.22102E+00
103	+T/2	SX	-9.78173E-02	SY	-8.02666E-01	SXY	-7.48586E-01	TMAX	8.27396E-01	S1	3.77154E-01	S2	-1.27764E+00	SI	1.65479E+00
	MID	SX	1.67222E-01	SY	7.72756E-01	SXY	3.39039E-01	TMAX	4.54549E-01	S1	9.24538E-01	S2	1.54396E-02	SI	9.24538E-01
	-T/2	SX	4.32261E-01	SY	2.34818E+00	SXY	1.42666E+00	TMAX	1.71844E+00	S1	3.10866E+00	S2	-3.28226E-01	SI	3.43689E+00
104	+T/2	SX	1.62977E-01	SY	5.60724E-01	SXY	-6.28569E-01	TMAX	6.59279E-01	S1	1.02113E+00	S2	-2.97429E-01	SI	1.31856E+00
	MID	SX	4.48431E-02	SY	1.26335E-01	SXY	2.05575E-01	TMAX	2.09574E-01	S1	2.95163E-01	S2	-1.23985E-01	SI	4.19149E-01
	-T/2	SX	-7.32913E-02	SY	-3.08054E-01	SXY	1.03972E+00	TMAX	1.04632E+00	S1	8.55650E-01	S2	-1.23699E+00	SI	2.09264E+00

105	+T/2	SX	1.42989E-01	SY	1.54766E+00	SXY	-8.29828E-02	TMAX	7.07218E-01	S1	1.55254E+00	S2	1.38104E-01	SI	1.55254E+00
	MID	SX	1.29929E-02	SY	-3.57892E-01	SXY	2.72381E-01	TMAX	3.29516E-01	S1	1.57066E-01	S2	-5.01965E-01	SI	6.59031E-01
	-T/2	SX	-1.17003E-01	SY	-2.26344E+00	SXY	6.27746E-01	TMAX	1.24333E+00	S1	5.31054E-02	S2	-2.43355E+00	SI	2.48665E+00
106	+T/2	SX	1.76316E-01	SY	1.20943E+00	SXY	-9.77234E-03	TMAX	5.16649E-01	S1	1.20952E+00	S2	1.76224E-01	SI	1.20952E+00
	MID	SX	3.81192E-02	SY	-6.98918E-01	SXY	2.86126E-01	TMAX	4.66556E-01	S1	1.36156E-01	S2	-7.96955E-01	SI	9.33111E-01
	-T/2	SX	-1.00077E-01	SY	-2.60726E+00	SXY	5.82025E-01	TMAX	1.38212E+00	S1	2.84472E-02	S2	-2.73579E+00	SI	2.76423E+00
107	+T/2	SX	3.02712E-02	SY	4.20676E-01	SXY	7.47547E-02	TMAX	2.09027E-01	S1	4.34500E-01	S2	1.64467E-02	SI	4.34500E-01
	MID	SX	2.23636E-02	SY	-1.07093E+00	SXY	3.62863E-01	TMAX	6.56118E-01	S1	1.31835E-01	S2	-1.18040E+00	SI	1.31224E+00
	-T/2	SX	1.44561E-02	SY	-2.56253E+00	SXY	6.50972E-01	TMAX	1.44360E+00	S1	1.69562E-01	S2	-2.71764E+00	SI	2.88720E+00
108	+T/2	SX	-5.02857E-01	SY	-7.36432E-01	SXY	3.90190E-01	TMAX	4.07293E-01	S1	-2.12352E-01	S2	-1.02694E+00	SI	1.02694E+00
	MID	SX	-5.88254E-02	SY	-1.54739E+00	SXY	5.82253E-01	TMAX	9.44975E-01	S1	1.41865E-01	S2	-1.74808E+00	SI	1.88995E+00
	-T/2	SX	3.85206E-01	SY	-2.35836E+00	SXY	7.74315E-01	TMAX	1.57523E+00	S1	5.88655E-01	S2	-2.56180E+00	SI	3.15046E+00
109	+T/2	SX	-2.71367E+00	SY	-1.91275E+00	SXY	9.22228E-01	TMAX	1.00542E+00	S1	-1.30779E+00	S2	-3.31863E+00	SI	3.31863E+00
	MID	SX	-1.35550E+00	SY	-2.36594E+00	SXY	1.26766E+00	TMAX	1.36463E+00	S1	-4.96085E-01	S2	-3.22535E+00	SI	3.22535E+00
	-T/2	SX	2.67215E-03	SY	-2.81912E+00	SXY	1.61310E+00	TMAX	2.14306E+00	S1	7.34841E-01	S2	-3.55129E+00	SI	4.28613E+00

FINISH

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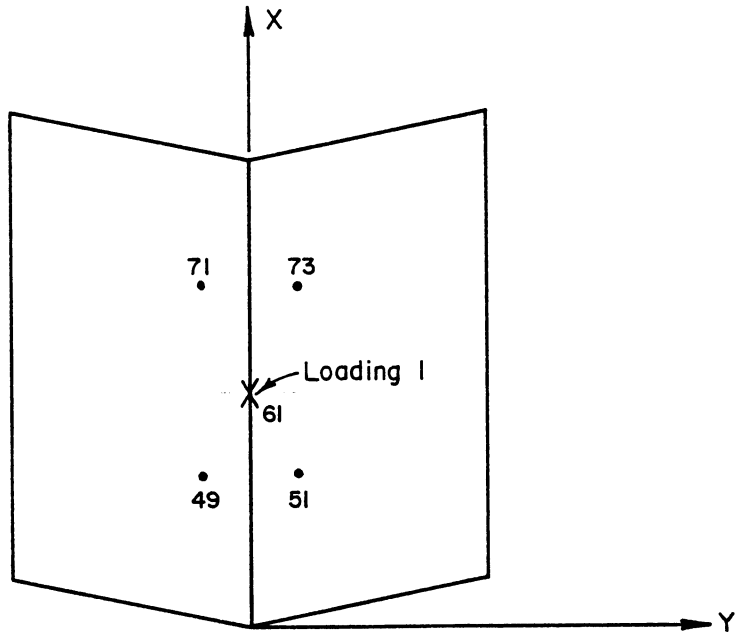
Discussion of Results:

Loading 1, is a unit load applied to determine the effect of asymmetry in this problem. The use of 'PBSQ2' element and the element incidence chosen cause the asymmetry effects to come in.



Due to the symmetry of the geometry and the unit load at joint 61, the displacement for joints 49, 51, 71 and 73 should be the same if asymmetry were not present. However for this run, the displacements are not all the same. Table 8.10.1 shows the displacements for those joints under load 1.

Table 8.10.1

	Displacement			Rotation		
Node	DX	DY	DZ	RX	RY	RZ
49	$1x10^{-7}$	0.	$5x10^{-6}$	$2.3x10^{-5}$	$-4x10^{-5}$	$1.8x10^{-5}$
51	$1x10^{-7}$	0.	$4.9x10^{-6}$	$-2.1x10^{-5}$	$-4.4x10^{-5}$	$-3.4x10^{-6}$
71	$-1x10^{-7}$	0.	$4.9x10^{-6}$	$2.1x10^{-5}$	$4.3x10^{-5}$	$-6.5x10^{-6}$
73	$-1x10^{-7}$	0.	5.10^{-6}	$-2.3x10^{-5}$	$4.2x10^{-5}$	$1.3x10^{-5}$

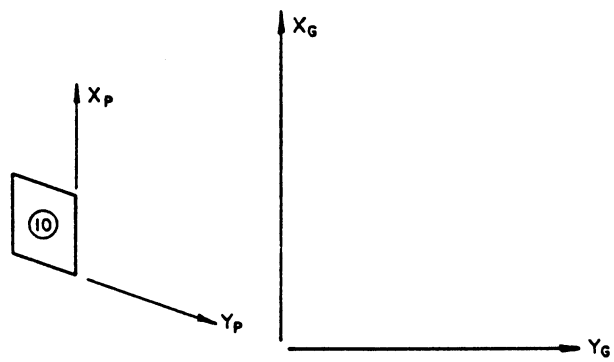
The greatest discrepancy occurs for RZ, the rotation in the global Z axis. This is to be expected. Again, 'PBSQ2' is formed by 2 'PBST2' elements, and the U6 degree of freedom in these elements is formed arbitrarily as discussed in Section 8.10. Hence, a user should be careful when these quantities are considered. The other displacement and rotation responses were pretty close, and the effect of asymmetries for this problem is ignored.

The result of stresses for loading 2, wind load:

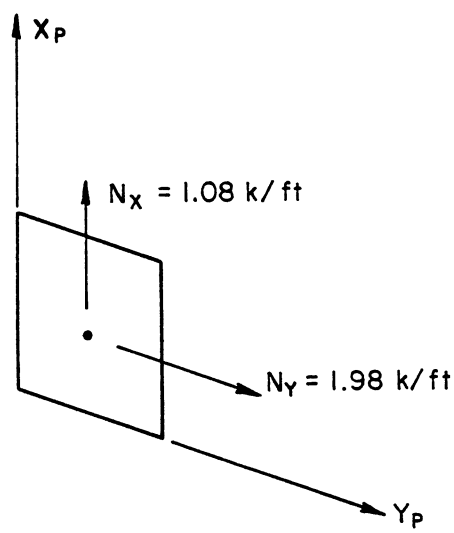
Again, the output of STRESSES for the 'PBSQ2' element is reported at the centroid of each element in terms of the element planar coordinate system.

Looking at element 10, the following results are available.

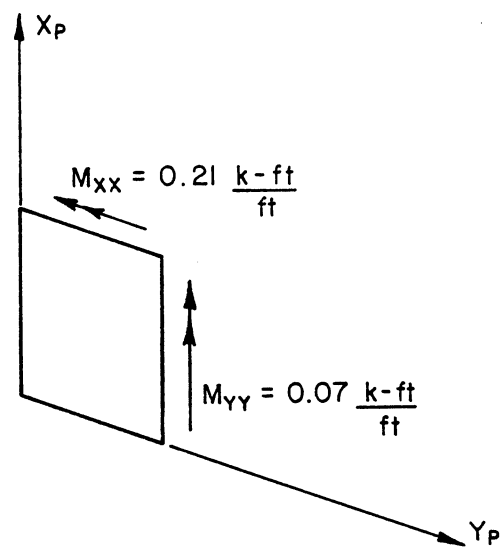
The planar coordinate system for element 10 is



In-plane Forces



Bending Moment



The in-plane and bending stresses are computed:

for in-plane stress (sec. 8.10.1)

$\sigma x = N_x/h = 1.08/0.5 = 2.16$ K/Ft2

$\sigma y = N_y/h = 1.98/0.5 = 3.96$ K/Ft2

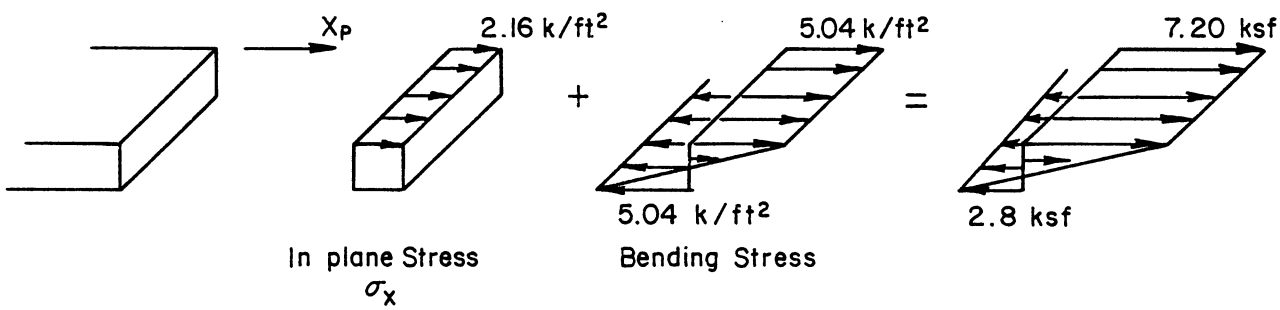
for the maximum bending stress (Sec. 8.9.1)

$\sigma z_{max} = \pm 6M_{xx}/h^2 = \pm 6(0.21)/(0.5)^2$
$= 5.04$ K/Ft2

$\sigma y_{max} = \pm -1.68$ K/Ft2

The total combined stress at the centroid of element 10 is:

for the x face



Similarly the stress for the y face (σ_y) can also be obtained.

This tedious work of getting the total combined stress for each element can be eliminated with the help of the special postprocessing program 'QQSTDPBS.' Hence, using the command

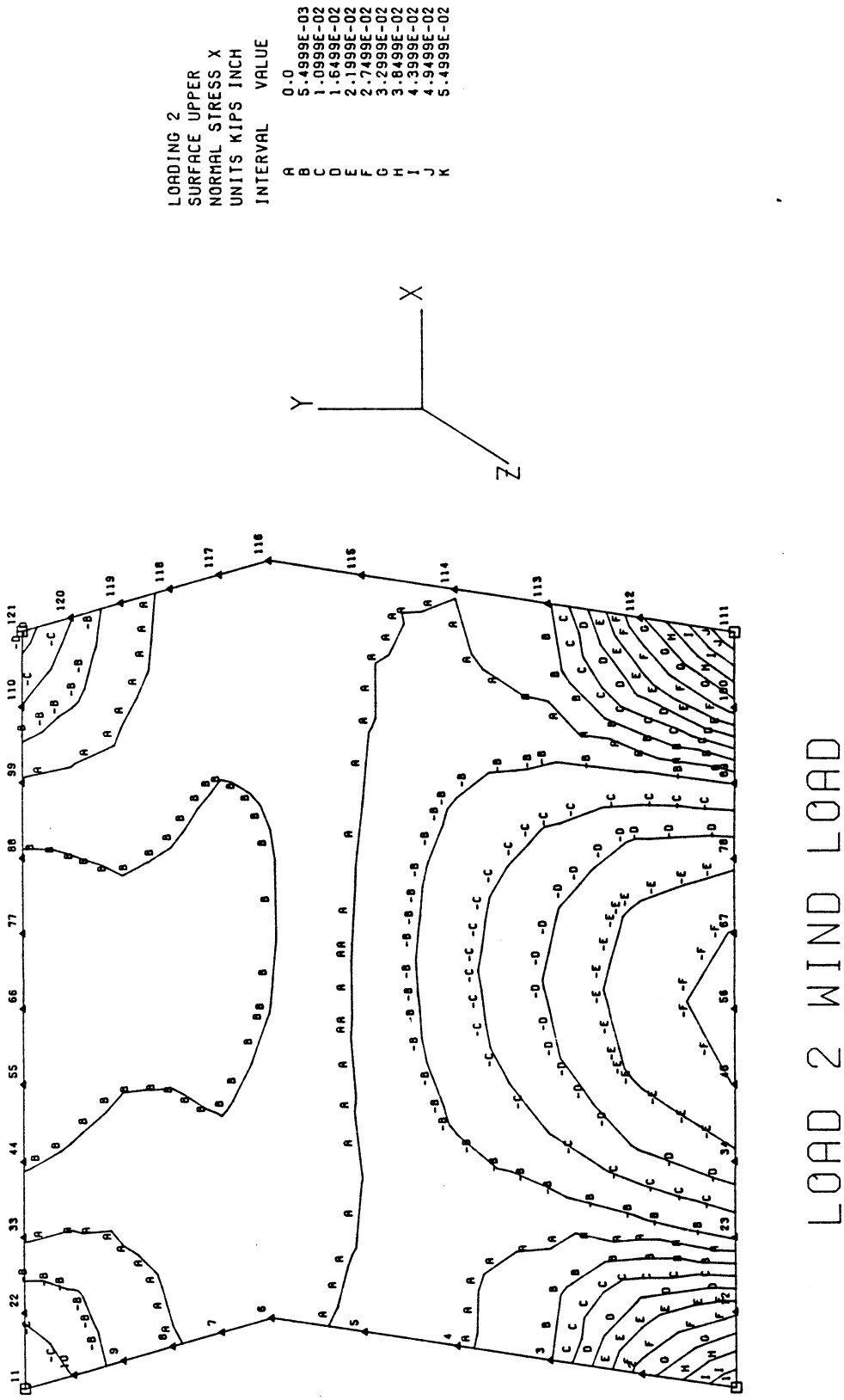
[EXECUTE PROGRAM 'QQSTDPBS'], the combined stresses for all elements are calculated and listed,

Contour Plot:

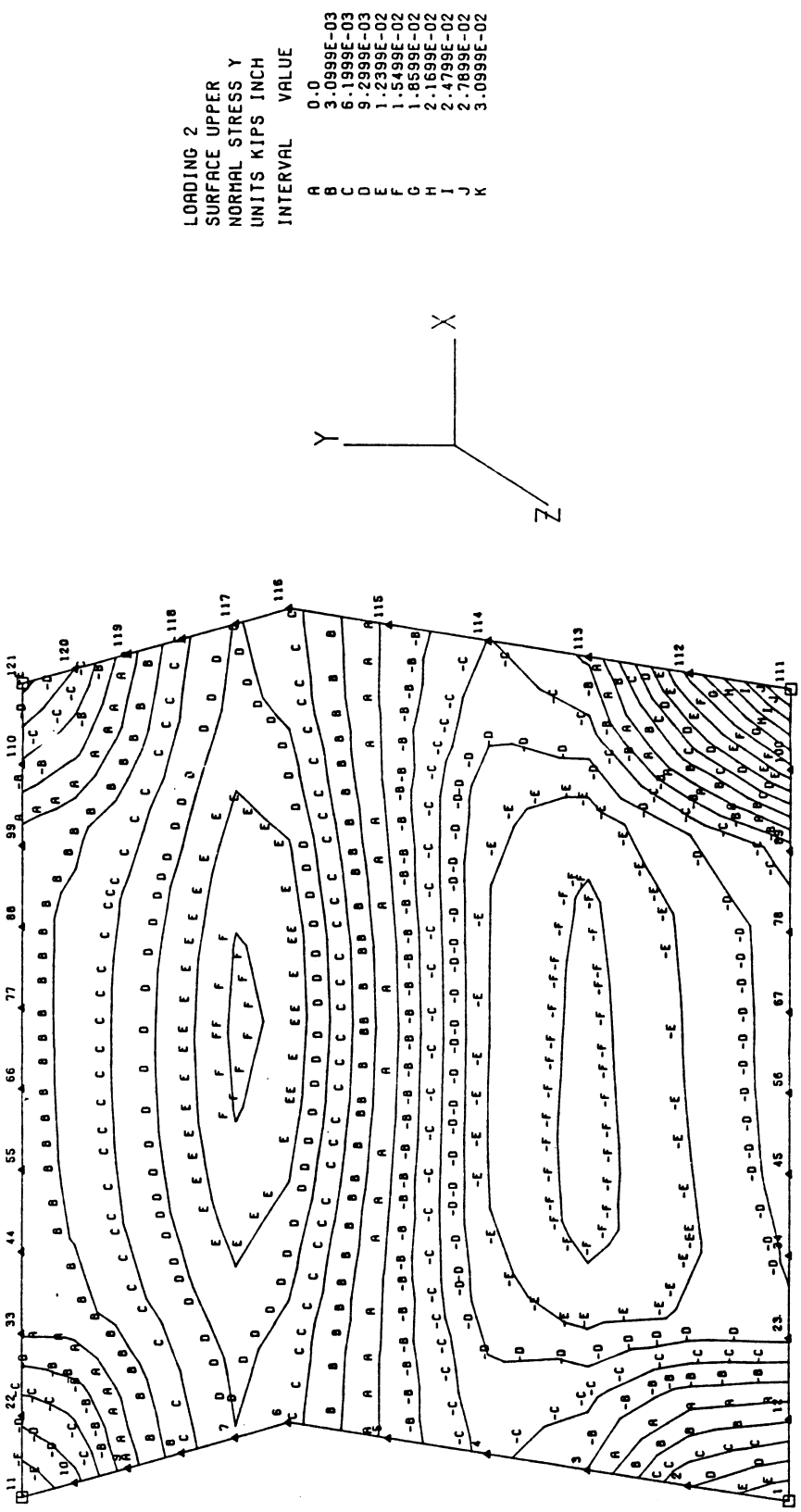
Interpretation of all these stresses can be very time consuming and difficult. Hence, a contour plot can be used to help to visualize the stress distribution across the plate. For details of the STRUDL contour plot command, see STRUDL user manual appendix I.

The following STRUDL commands were used to get the contour plots of the normal stress X and Y for the upper surface of the plate.

```
PLOT DEVICE PLOTTER PAPER 12
PLOT FORMAT NORMAL
OUTLINE
TITLE 'LOAD 2 WIND LOAD'
CONTOUR PLOTTING SPECIFICATION
COMP STRESS NORMAL X Y
SURFACE UPPER
PRINT VALUE
END
PLOT CONTOUR THREE DIMENSION
PLOT FINISH
```



LOAD 2 WIND LOAD


LOADING 2
SURFACE UPPER
NORMAL STRESS Y
UNITS KIPS INCH
INTERVAL VALUE
A 0.0
B 3.0999E-03
C 6.1999E-03
D 9.2999E-03
E 1.2399E-02
F 1.5499E-02
G 1.8599E-02
H 2.1699E-02
I 2.4799E-02
J 2.7899E-02
K 3.0999E-02
X
Y
Z

8.11 COMBINATION OF DIFFERENT TYPES OF ELEMENTS WITH MEMBERS.

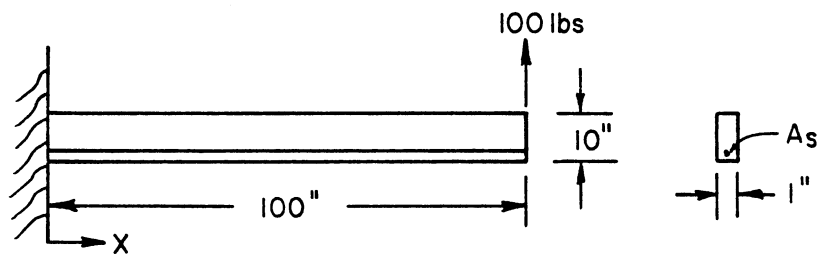
So far the use of the STRUDL finite element in this chapter has been restricted to one type of problem at a time. However, the main feature of the STRUDL finite element capability is the ability to combine members and elements of different types in the solution of a problem.

The following examples illustrate the application of this combination capability.

8.11.1 Example # 1

Combining Finite Element with Truss Member

Consider a reinforced concrete cantilever beam.



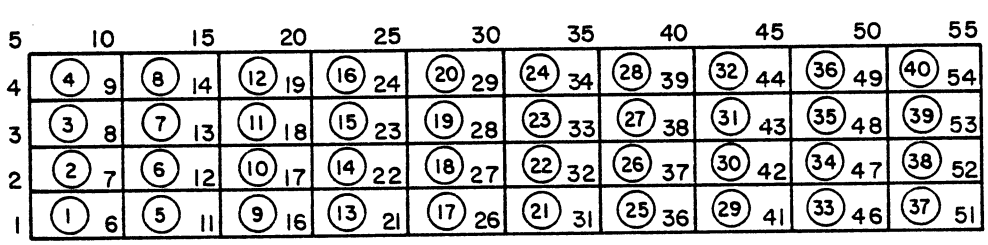
E_s = 29,000,000 psi; f'c = 3,250 psi As = 0.03 in^2
E_c = 3,250,000 psi fy = 60,000 psi
N_c = 0.18

- Find tensile force @ x = 50"

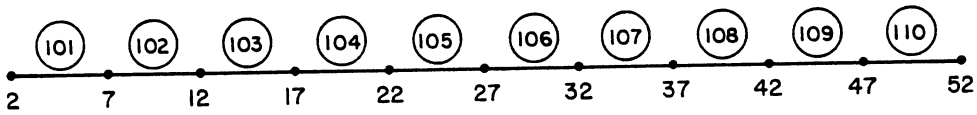
  - Assumptions:
    - i) Concrete as a linear elastic material
    - ii) Perfect bonding between steel and concrete
    - iii) Steel member acts as a tension tie, i.e., its bending rigidity is neglected

Hence: Model the problem with:
Plane stress: 'IPLQCSH': for the concrete beam.
: 'Plane truss': for tension steel.

Plane Stress Elements

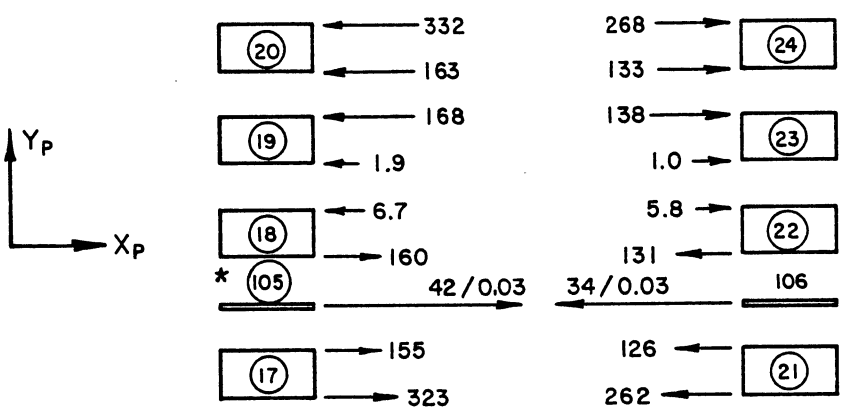


Plane truss members



Note: Both plane stress and plane truss elements have 2 degrees of freedom per joint.

Interpretation of results: @ x = 50 in.



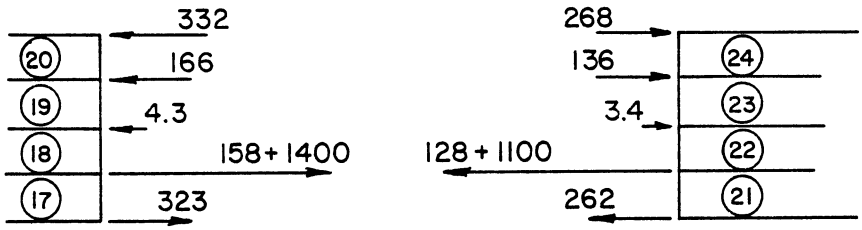
Element results in planar coord.

member results in local coordinates

* Note: the member gives force instead of stress.

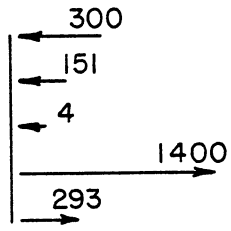
The original assumption of linear elastic material means that superposition applies. This means the results of plane stress elements are added to the plane TRUSS members to get the total response of the system.

Average Stress @ Joint:



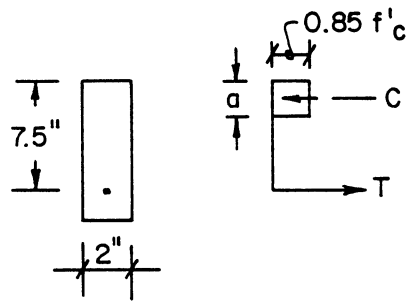
or

Stress:



The axial force @ X = 50" of the steel $T = \frac{41.95 + 34.5}{2} = \underline{38\ lb}$

<u>Let's check with ultimate strength method</u>



f'c = 3250 psi
C = T
C = 0.85 f'ca b

M = 50 * 100
= 5,000 lb-in

$M = C\ [7.5 - a/2]$

$\therefore 0.85\ f'c\ 1/2\ a^2 - 0.85f'c(7.5)a + 5000 = 0$

Solving a = 0.245

$\therefore T = C = 0.85\ f'ca = \underline{\underline{677.75\ lb}}$

There is a big difference between the finite element and the ultimate strength solution. $T_{F.E.} = \underline{38\ lb}$ and $T_{U.S.} = \underline{677.75\ lb}$

This is to be expected, since the ultimate strength method is a non-linear model where concrete tensile strength is not considered.

Hence, the engineer should be extremely careful when interpreting the F.E. model's answers. These answers could be inaccurate if the original modeling assumptions were invalid.

The following are the input and output of the STRUDL run for this problem.

```
STRUDL 'BEAM'   'IPLQCSH AND PLANE TRUSS'
*****************************************************************
*                                                               *
*   MCAUTO STRUDL                          RELEASE 4.5  APR 1981  *
*   MCAUTO STRUDL DYNAL                    RELEASE 6.5            *
*   MCAUTO STRUDL PLOTS                    RELEASE 3.5            *
*                                                               *
*                                                               *
*                    TIME 13.23.32,  2/05/82                    *
*                                                               *
*                  DATA POOL SIZE   30640 BYTES                 *
*                                                               *
*****************************************************************


$                                         BDEROCBSM9

$ MODELLING OF A REINFORCED CONCRETE BEAM

$   MIXING PLANE STRESS AND PLANE TRUSS.

$

$ THIS EXAMPLE INPUT IS TO SHOW THE PROCEDURE REQUIRED TO MIX

$   FINITE ELEMENTS WITH TRUSS MEMBERS.

$

$ DEFINE THE PLANE STRESS ELEMENT LOCATION AND INCIDENCES

$   USING STRUCTURAL GENERATION OPTION 2

TYPE PLANE STRESS

USE STRUCTURE GENERATOR
*** STRUCTURE GENERATOR RELEASED JANUARY 1976

SPACING 11 X XY 10.

SPACING 5  Y YX  2.5

SHAPE DIMENSION 2 NODES 4
GENERATION STATUS.
TOTAL NUMBER OF NODES=   55
TOTAL NUMBER OF ELEMENTS=   40
TOTAL NUMBER OF NODES/ELEMENT=    4
```

```
GENERATE  PRINT OFF
END STRUCTURE GENERATOR
*** SUCCESSFULLY OUT OF GENERATE COMMAND
$ DEFINE THE TRUSS MEMBER INCIDENCES
TYPE PLANE TRUSS
MESH INCIDENCES
 101 TO 110  /  2  TO 47  BY 5  /  7 TO 52  BY 5
$ DEFINE AND INPUT ELEMENTS AND MEMBERS PROPERTIES
ELEMENT PROPERTIES
  1 TO 40 TYPE 'IPLQCSH' THICKNESS 1.
MEMBER PROPERTIES PRISMATIC
 101 TO 110  AX  0.03
CONSTANTS
  E 3250000.  ALL BUT 29000000.  101 TO 110
  G 1380000.  ALL BUT 11200000.  101 TO 110
  POISSON  0.18  1 TO 40
$ BOUNDARY CONDITIONS
SUPPORT JOINTS  1 TO 5
$ LOADING
LOADING 1  'END JOINT LOAD'
 JOINT 55 LOAD FORCE Y 100.
PRINT STRUCTURAL DATA
```

```
****************************************
*  PROBLEM DATA FROM INTERNAL STORAGE  *
****************************************
```

JOB ID - BEAM JOB TITLE - IPLQCSH AND PLANE TRUSS

ACTIVE UNITS -	LENGTH	FORCE	ANGLE	TEMPERATURE	TIME	MASS
	INCH	LB	RAD	FAHR	SEC	LBM

********** STRUCTURAL DATA **********

JOINT COORDINATE REFERENCE SYSTEMS ----------/

ID.	ORIGIN	X	Y	Z	ROTAT.	R1	R2	R3

JOINT COORDINATES----------/ STATUS---/

JOINT	X	Y	Z	CONDITION		
1	0.0	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
2	0.0	2.500	0.0	SUPPORT	ACTIVE	GLOBAL
3	0.0	5.000	0.0	SUPPORT	ACTIVE	GLOBAL
4	0.0	7.500	0.0	SUPPORT	ACTIVE	GLOBAL
5	0.0	10.000	0.0	SUPPORT	ACTIVE	GLOBAL
6	10.000	0.0	0.0		ACTIVE	GLOBAL
7	10.000	2.500	0.0		ACTIVE	GLOBAL
8	10.000	5.000	0.0		ACTIVE	GLOBAL
9	10.000	7.500	0.0		ACTIVE	GLOBAL
10	10.000	10.000	0.0		ACTIVE	GLOBAL
11	20.000	0.0	0.0		ACTIVE	GLOBAL
12	20.000	2.500	0.0		ACTIVE	GLOBAL
13	20.000	5.000	0.0		ACTIVE	GLOBAL
14	20.000	7.500	0.0		ACTIVE	GLOBAL
15	20.000	10.000	0.0		ACTIVE	GLOBAL
16	30.000	0.0	0.0		ACTIVE	GLOBAL
17	30.000	2.500	0.0		ACTIVE	GLOBAL
18	30.000	5.000	0.0		ACTIVE	GLOBAL
19	30.000	7.500	0.0		ACTIVE	GLOBAL
20	30.000	10.000	0.0		ACTIVE	GLOBAL
21	40.000	0.0	0.0		ACTIVE	GLOBAL
22	40.000	2.500	0.0		ACTIVE	GLOBAL
23	40.000	5.000	0.0		ACTIVE	GLOBAL
24	40.000	7.500	0.0		ACTIVE	GLOBAL
25	40.000	10.000	0.0		ACTIVE	GLOBAL
26	50.000	0.0	0.0		ACTIVE	GLOBAL

27	50.000	2.500	0.0	ACTIVE	GLOBAL
28	50.000	5.000	0.0	ACTIVE	GLOBAL
29	50.000	7.500	0.0	ACTIVE	GLOBAL
30	50.000	10.000	0.0	ACTIVE	GLOBAL
31	60.000	0.0	0.0	ACTIVE	GLOBAL
32	60.000	2.500	0.0	ACTIVE	GLOBAL
33	60.000	5.000	0.0	ACTIVE	GLOBAL
34	60.000	7.500	0.0	ACTIVE	GLOBAL
35	60.000	10.000	0.0	ACTIVE	GLOBAL
36	70.000	0.0	0.0	ACTIVE	GLOBAL
37	70.000	2.500	0.0	ACTIVE	GLOBAL
38	70.000	5.000	0.0	ACTIVE	GLOBAL
39	70.000	7.500	0.0	ACTIVE	GLOBAL
40	70.000	10.000	0.0	ACTIVE	GLOBAL
41	80.000	0.0	0.0	ACTIVE	GLOBAL
42	80.000	2.500	0.0	ACTIVE	GLOBAL
43	80.000	5.000	0.0	ACTIVE	GLOBAL
44	80.000	7.500	0.0	ACTIVE	GLOBAL
45	80.000	10.000	0.0	ACTIVE	GLOBAL
46	90.000	0.0	0.0	ACTIVE	GLOBAL
47	90.000	2.500	0.0	ACTIVE	GLOBAL
48	90.000	5.000	0.0	ACTIVE	GLOBAL
49	90.000	7.500	0.0	ACTIVE	GLOBAL
50	90.000	10.000	0.0	ACTIVE	GLOBAL
51	100.000	0.0	0.0	ACTIVE	GLOBAL
52	100.000	2.500	0.0	ACTIVE	GLOBAL
53	100.000	5.000	0.0	ACTIVE	GLOBAL
54	100.000	7.500	0.0	ACTIVE	GLOBAL
55	100.000	10.000	0.0	ACTIVE	GLOBAL

JOINT RELEASES----------/ELASTIC SUPPORT RELEASES----------/

JOINT	FORCE	MOMENT	THETA 1	THETA 2	THETA 3	KFX	KFY	KFZ	KMX	KMY	KMZ

MEMBER INCIDENCES----------/--LENGTH-----/---------RELEASES----------/--STATUS--/-----TYPE---------/

MEMBER	START	END	LOCAL COORD.	START FORCE	START MOMENT	END FORCE	END MOMENT	STATUS	TYPE		
101	2	7	10.000					ACTIVE	PLANE	TRUSS	XY
102	7	12	10.000					ACTIVE	PLANE	TRUSS	XY
103	12	17	10.000					ACTIVE	PLANE	TRUSS	XY
104	17	22	10.000					ACTIVE	PLANE	TRUSS	XY
105	22	27	10.000					ACTIVE	PLANE	TRUSS	XY
106	27	32	10.000					ACTIVE	PLANE	TRUSS	XY
107											

	32	37	10.000	ACTIVE	PLANE	TRUSS	XY
108	37	42	10.000	ACTIVE	PLANE	TRUSS	XY
109	42	47	10.000	ACTIVE	PLANE	TRUSS	XY
110	47	52	10.000	ACTIVE	PLANE	TRUSS	XY

ELEMENT INCIDENCES----------/--STATUS--/-----/----TYPE----/

ELEMENT	NODES					
1	7	2	1	6	ACTIVE	IPLQCSH
2	8	3	2	7	ACTIVE	IPLQCSH
3	9	4	3	8	ACTIVE	IPLQCSH
4	10	5	4	9	ACTIVE	IPLQCSH
5	12	7	6	11	ACTIVE	IPLQCSH
6	13	8	7	12	ACTIVE	IPLQCSH
7	14	9	8	13	ACTIVE	IPLQCSH
8	15	10	9	14	ACTIVE	IPLQCSH
9	17	12	11	16	ACTIVE	IPLQCSH
10	18	13	12	17	ACTIVE	IPLQCSH
11	19	14	13	18	ACTIVE	IPLQCSH
12	20	15	14	19	ACTIVE	IPLQCSH
13	22	17	16	21	ACTIVE	IPLQCSH
14	23	18	17	22	ACTIVE	IPLQCSH
15	24	19	18	23	ACTIVE	IPLQCSH
16	25	20	19	24	ACTIVE	IPLQCSH
17	27	22	21	26	ACTIVE	IPLQCSH
18	28	23	22	27	ACTIVE	IPLQCSH
19	29	24	23	28	ACTIVE	IPLQCSH
20	30	25	24	29	ACTIVE	IPLQCSH
21	32	27	26	31	ACTIVE	IPLQCSH
22	33	28	27	32	ACTIVE	IPLQCSH
23	34	29	28	33	ACTIVE	IPLQCSH
24	35	30	29	34	ACTIVE	IPLQCSH
25	37	32	31	36	ACTIVE	IPLQCSH
26	38	33	32	37	ACTIVE	IPLQCSH
27	39	34	33	38	ACTIVE	IPLQCSH
28	40	35	34	39	ACTIVE	IPLQCSH
29	42	37	36	41	ACTIVE	IPLQCSH
30	43	38	37	42	ACTIVE	IPLQCSH
31	44	39	38	43	ACTIVE	IPLQCSH
32	45	40	39	44	ACTIVE	IPLQCSH
33	47	42	41	46	ACTIVE	IPLQCSH
34	48	43	42	47	ACTIVE	IPLQCSH
35	49	44	43	48	ACTIVE	IPLQCSH
36	50	45	44	49	ACTIVE	IPLQCSH
37	52	47	46	51	ACTIVE	IPLQCSH
38	53	48	47	52	ACTIVE	IPLQCSH
39	54	49	48	53	ACTIVE	IPLQCSH
40	55	50	49	54	ACTIVE	IPLQCSH

MEMBER PROPERTIES----------/

MEMBER/SEG	TYPE	SEG.L	COMP	AX YD	AY ZD PHI	AZ YC ID/TYPE	IX ZC OD/SPAC	IY EY TH-PIPE	IZ EZ R	IYZ FLTK ALPHA	SY WBTK FC	SZ THICK SC
101	PRISMATIC			0.030	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
102	PRISMATIC			0.030	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
103	PRISMATIC			0.030	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
104	PRISMATIC			0.030	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
105	PRISMATIC			0.030	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
106	PRISMATIC			0.030	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
107	PRISMATIC			0.030	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
108	PRISMATIC			0.030	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
109	PRISMATIC			0.030	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
110	PRISMATIC			0.030	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					

ELEMENT PROPERTIES----------/

ELEMENT	TYPE	THICKNESS	/--------CURVATURES--------/			/----------THERMAL EXPANSION COEFFICIENTS----------/					
			K1	K2	K12	CAX	CAY	CAZ	CSXY	CSXZ	CSYZ
1	IPLQCSH	1.000									
2	IPLQCSH	1.000									
3	IPLQCSH	1.000									
4											

	IPLQCSH	1.000
5	IPLQCSH	1.000
6	IPLQCSH	1.000
7	IPLQCSH	1.000
8	IPLQCSH	1.000
9	IPLQCSH	1.000
10	IPLQCSH	1.000
11	IPLQCSH	1.000
12	IPLQCSH	1.000
13	IPLQCSH	1.000
14	IPLQCSH	1.000
15	IPLQCSH	1.000
16	IPLQCSH	1.000
17	IPLQCSH	1.000
18	IPLQCSH	1.000
19	IPLQCSH	1.000
20	IPLQCSH	1.000
21	IPLQCSH	1.000
22	IPLQCSH	1.000
23	IPLQCSH	1.000
24	IPLQCSH	1.000
25	IPLQCSH	1.000
26	IPLQCSH	1.000
27	IPLQCSH	1.000
28	IPLQCSH	1.000
29	IPLQCSH	1.000
30	IPLQCSH	1.000
31	IPLQCSH	1.000
32	IPLQCSH	1.000
33	IPLQCSH	1.000
34	IPLQCSH	1.000
35	IPLQCSH	1.000
36	IPLQCSH	1.000
37	IPLQCSH	1.000
38	IPLQCSH	1.000
39	IPLQCSH	1.000
40	IPLQCSH	1.000

MEMBER CONSTANTS----------/

CONSTANT	STANDARD VALUE	DOMAIN	VALUE	MEMBER LIST					
E	0.325000E+07	ALL BUT							
			0.290000E+08	101	102	103	104	105	106
				107	108	109	110		
G	0.138000E+07	ALL BUT							
			0.112000E+08	101	102	103	104	105	106

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                                                                                                                                  PAGE -        9

                                                                  107       108       109       110

DENSITY      0.999999E+00    ALL

  CTE        0.100000E+01    ALL

  BETA       0.0             ALL

POISSON      0.0             ALL BUT
                                          0.180000E+00  1         2         3         4         5         6
                                                        7         8         9         10        11        12

                                                        13        14        15        16        17        18

                                                        19        20        21        22        23        24

                                                        25        26        27        28        29        30

                                                        31        32        33        34        35        36

                                                        37        38        39        40


****************************************
*  END OF DATA FROM  INTERNAL STORAGE  *
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PAGE -  10

STIFFNESS ANALYSIS REDUCE BAND

PAGE -  13

LIST DISPLACEMENT STRESS  REACTIONS FORCES ALL
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PAGE - 14

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****************************
*RESULTS OF LATEST ANALYSES*
****************************


 PROBLEM - BEAM      TITLE - IPLQCSH AND PLANE TRUSS

 ACTIVE UNITS  INCH LB   RAD  FAHR SEC  LBM


 LOADING - 1            END JOINT LOAD

/-ELEMENT-//-------------------------------------------------------------------------------------------------------------/

 1        NODE   7          SXX  0.257616E+03   SYY -0.431249E+02   SXY -0.236040E+03
                 2          SXX  0.274264E+03   SYY  0.493676E+02   SXY  0.243586E+03
                 1          SXX  0.566719E+03   SYY  0.102009E+03   SXY  0.253066E+03
                 6          SXX  0.550071E+03   SYY  0.951697E+01   SXY -0.226559E+03

 2        NODE   8          SXX -0.124386E+02   SYY -0.304205E+02   SXY -0.220995E+03
                 3          SXX -0.719607E+01   SYY -0.129529E+01   SXY  0.240601E+03
                 2          SXX  0.274264E+03   SYY  0.493676E+02   SXY  0.243586E+03
                 7          SXX  0.269022E+03   SYY  0.202424E+02   SXY -0.218010E+03

 3        NODE   9          SXX -0.282900E+03   SYY -0.197474E+02   SXY -0.217763E+03
                 4          SXX -0.288700E+03   SYY -0.519659E+02   SXY  0.243903E+03
                 3          SXX -0.719607E+01   SYY -0.129529E+01   SXY  0.240601E+03
                 8          SXX -0.139674E+01   SYY  0.309232E+02   SXY -0.221065E+03

 4        NODE   10         SXX -0.564197E+03   SYY -0.893701E+01   SXY -0.226358E+03
                 5          SXX -0.581427E+03   SYY -0.104657E+03   SXY  0.253714E+03
                 4          SXX -0.288700E+03   SYY -0.519659E+02   SXY  0.243903E+03
                 9          SXX -0.271470E+03   SYY  0.437539E+02   SXY -0.236170E+03

 5        NODE   12         SXX  0.244569E+03   SYY -0.138065E+02   SXY -0.199994E+03
                 7          SXX  0.238678E+03   SYY -0.465337E+02   SXY  0.212188E+03
                 6          SXX  0.490009E+03   SYY -0.129419E+01   SXY  0.208834E+03
                 11         SXX  0.495899E+03   SYY  0.314330E+02   SXY -0.203349E+03

 6        NODE   13         SXX -0.104353E+02   SYY -0.210956E+02   SXY -0.198819E+03
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/-ELEMENT-//----------/

		8	SXX	-0.121029E+02	SYY	-0.303601E+02	SXY	0.231168E+03
		7	SXX	0.250084E+03	SYY	0.168335E+02	SXY	0.230219E+03
		12	SXX	0.251752E+03	SYY	0.260980E+02	SXY	-0.199768E+03
7	NODE	14	SXX	-0.265320E+03	SYY	-0.263287E+02	SXY	-0.200347E+03
		9	SXX	-0.263507E+03	SYY	-0.162567E+02	SXY	0.230065E+03
		8	SXX	-0.106104E+01	SYY	0.309836E+02	SXY	0.231098E+03
		13	SXX	-0.287401E+01	SYY	0.209116E+02	SXY	-0.199314E+03
8	NODE	15	SXX	-0.508675E+03	SYY	-0.316507E+02	SXY	-0.202649E+03
		10	SXX	-0.502591E+03	SYY	0.215210E+01	SXY	0.208193E+03
		9	SXX	-0.252077E+03	SYY	0.472446E+02	SXY	0.211659E+03
		14	SXX	-0.258161E+03	SYY	0.134418E+02	SXY	-0.199184E+03
9	NODE	17	SXX	0.209103E+03	SYY	-0.177713E+02	SXY	-0.183267E+03
		12	SXX	0.208653E+03	SYY	-0.202715E+02	SXY	0.197452E+03
		11	SXX	0.440799E+03	SYY	0.215149E+02	SXY	0.197195E+03
		16	SXX	0.441249E+03	SYY	0.240151E+02	SXY	-0.183524E+03
10	NODE	18	SXX	-0.917271E+01	SYY	-0.190201E+02	SXY	-0.171703E+03
		13	SXX	-0.951654E+01	SYY	-0.209303E+02	SXY	0.197874E+03
		12	SXX	0.215835E+03	SYY	0.196331E+02	SXY	0.197678E+03
		17	SXX	0.216179E+03	SYY	0.215433E+02	SXY	-0.171899E+03
11	NODE	19	SXX	-0.227294E+03	SYY	-0.216939E+02	SXY	-0.171735E+03
		14	SXX	-0.226883E+03	SYY	-0.194099E+02	SXY	0.197145E+03
		13	SXX	-0.195524E+01	SYY	0.210770E+02	SXY	0.197379E+03
		18	SXX	-0.236636E+01	SYY	0.187930E+02	SXY	-0.171502E+03
12	NODE	20	SXX	-0.453062E+03	SYY	-0.242236E+02	SXY	-0.183852E+03
		15	SXX	-0.452581E+03	SYY	-0.215538E+02	SXY	0.198035E+03
		14	SXX	-0.219724E+03	SYY	0.203606E+02	SXY	0.198308E+03
		19	SXX	-0.220205E+03	SYY	0.176908E+02	SXY	-0.183560E+03
13	NODE	22	SXX	0.184610E+03	SYY	-0.134482E+02	SXY	-0.153620E+03
		17	SXX	0.182986E+03	SYY	-0.224722E+02	SXY	0.165647E+03
		16	SXX	0.377662E+03	SYY	0.125694E+02	SXY	0.164723E+03
		21	SXX	0.379286E+03	SYY	0.215935E+02	SXY	-0.154545E+03
14	NODE	23	SXX	-0.792167E+01	SYY	-0.167318E+02	SXY	-0.148091E+03
		18	SXX	-0.830546E+01	SYY	-0.188639E+02	SXY	0.177233E+03
		17	SXX	0.190063E+03	SYY	0.168423E+02	SXY	0.177015E+03
		22	SXX	0.190447E+03	SYY	0.189745E+02	SXY	-0.148309E+03
15	NODE	24	SXX	-0.200742E+03	SYY	-0.191860E+02	SXY	-0.148873E+03
		19	SXX	-0.200320E+03	SYY	-0.168386E+02	SXY	0.177193E+03
		18	SXX	-0.149911E+01	SYY	0.189491E+02	SXY	0.177434E+03

/-ELEMENT-//----------/

		23	SXX -0.192164E+01	SYY 0.166017E+02	SXY -0.148632E+03
16	NODE	25	SXX -0.389005E+03	SYY -0.216891E+02	SXY -0.153932E+03
		20	SXX -0.387332E+03	SYY -0.123922E+02	SXY 0.164395E+03
		19	SXX -0.193231E+03	SYY 0.225460E+02	SXY 0.165348E+03
		24	SXX -0.194904E+03	SYY 0.132492E+02	SXY -0.152978E+03
17	NODE	27	SXX 0.154732E+03	SYY -0.110438E+02	SXY -0.131261E+03
		22	SXX 0.153284E+03	SYY -0.190869E+02	SXY 0.144685E+03
		21	SXX 0.321543E+03	SYY 0.111997E+02	SXY 0.143860E+03
		26	SXX 0.322991E+03	SYY 0.192428E+02	SXY -0.132084E+03
18	NODE	28	SXX -0.671828E+01	SYY -0.135102E+02	SXY -0.122577E+03
		23	SXX -0.727729E+01	SYY -0.166158E+02	SXY 0.150315E+03
		22	SXX 0.159120E+03	SYY 0.133358E+02	SXY 0.149996E+03
		27	SXX 0.159679E+03	SYY 0.164414E+02	SXY -0.122896E+03
19	NODE	29	SXX -0.167845E+03	SYY -0.164559E+02	SXY -0.122763E+03
		24	SXX -0.167251E+03	SYY -0.131576E+02	SXY 0.149435E+03
		23	SXX -0.127725E+01	SYY 0.167177E+02	SXY 0.149774E+03
		28	SXX -0.187095E+01	SYY 0.134194E+02	SXY -0.122424E+03
20	NODE	30	SXX -0.331714E+03	SYY -0.194642E+02	SXY -0.132354E+03
		25	SXX -0.330209E+03	SYY -0.111058E+02	SXY 0.144473E+03
		24	SXX -0.161414E+03	SYY 0.192775E+02	SXY 0.145330E+03
		29	SXX -0.162918E+03	SYY 0.109191E+02	SXY -0.131492E+03
21	NODE	32	SXX 0.127484E+03	SYY -0.830637E+01	SXY -0.105179E+03
		27	SXX 0.126063E+03	SYY -0.162043E+02	SXY 0.117774E+03
		26	SXX 0.262009E+03	SYY 0.826616E+01	SXY 0.116971E+03
		31	SXX 0.263431E+03	SYY 0.161641E+02	SXY -0.105985E+03
22	NODE	33	SXX -0.542671E+01	SYY -0.112268E+02	SXY -0.980290E+02
		28	SXX -0.580825E+01	SYY -0.133464E+02	SXY 0.126351E+03
		27	SXX 0.131010E+03	SYY 0.112809E+02	SXY 0.126143E+03
		32	SXX 0.131392E+03	SYY 0.134006E+02	SXY -0.982437E+02
23	NODE	34	SXX -0.138623E+03	SYY -0.138449E+02	SXY -0.987322E+02
		29	SXX -0.138130E+03	SYY -0.111072E+02	SXY 0.126225E+03
		28	SXX -0.960922E+00	SYY 0.135832E+02	SXY 0.126509E+03
		33	SXX -0.145372E+01	SYY 0.108455E+02	SXY -0.984457E+02
24	NODE	35	SXX -0.269922E+03	SYY -0.161896E+02	SXY -0.105166E+03
		30	SXX -0.268462E+03	SYY -0.807892E+01	SXY 0.116658E+03
		29	SXX -0.133203E+03	SYY 0.162677E+02	SXY 0.117493E+03
		34	SXX -0.134663E+03	SYY 0.815701E+01	SXY -0.104332E+03
25	NODE	37	SXX 0.989717E+02	SYY -0.543817E+01	SXY -0.805961E+02

/-ELEMENT-//----------/

		32	SXX	0.974834E+02	SYY	-0.137065E+02	SXY 0.937932E+02
		31	SXX	0.203819E+03	SYY	0.543391E+01	SXY 0.929503E+02
		36	SXX	0.205307E+03	SYY	0.137022E+02	SXY -0.814402E+02
26	NODE	38	SXX	-0.403150E+01	SYY	-0.802146E+01	SXY -0.727567E+02
		33	SXX	-0.458105E+01	SYY	-0.110745E+02	SXY 0.101036E+03
		32	SXX	0.101392E+03	SYY	0.800053E+01	SXY 0.100728E+03
		37	SXX	0.101941E+03	SYY	0.110536E+02	SXY -0.730627E+02
27	NODE	39	SXX	-0.106950E+03	SYY	-0.109697E+02	SXY -0.732222E+02
		34	SXX	-0.106424E+03	SYY	-0.804922E+01	SXY 0.100318E+03
		33	SXX	-0.608060E+00	SYY	0.109977E+02	SXY 0.100618E+03
		38	SXX	-0.113374E+01	SYY	0.807724E+01	SXY -0.729180E+02
28	NODE	40	SXX	-0.211539E+03	SYY	-0.142961E+02	SXY -0.824505E+02
		35	SXX	-0.209937E+03	SYY	-0.539218E+01	SXY 0.938033E+02
		34	SXX	-0.102465E+03	SYY	0.139528E+02	SXY 0.947192E+02
		39	SXX	-0.104068E+03	SYY	0.504880E+01	SXY -0.815337E+02
29	NODE	42	SXX	0.710222E+02	SYY	-0.302799E+01	SXY -0.563078E+02
		37	SXX	0.696380E+02	SYY	-0.107182E+02	SXY 0.687080E+02
		36	SXX	0.145868E+03	SYY	0.300319E+01	SXY 0.679234E+02
		41	SXX	0.147252E+03	SYY	0.106934E+02	SXY -0.570905E+02
30	NODE	43	SXX	-0.330840E+01	SYY	-0.547955E+01	SXY -0.487468E+02
		38	SXX	-0.375706E+01	SYY	-0.797206E+01	SXY 0.764875E+02
		37	SXX	0.726078E+02	SYY	0.577361E+01	SXY 0.762373E+02
		42	SXX	0.730565E+02	SYY	0.826612E+01	SXY -0.489951E+02
31	NODE	44	SXX	-0.772354E+02	SYY	-0.740323E+01	SXY -0.485806E+02
		39	SXX	-0.769038E+02	SYY	-0.556137E+01	SXY 0.761338E+02
		38	SXX	-0.859295E+00	SYY	0.812664E+01	SXY 0.763255E+02
		43	SXX	-0.119083E+01	SYY	0.628479E+01	SXY -0.483857E+02
32	NODE	45	SXX	-0.149414E+03	SYY	-0.885229E+01	SXY -0.546843E+02
		40	SXX	-0.148346E+03	SYY	-0.292133E+01	SXY 0.672044E+02
		39	SXX	-0.740214E+02	SYY	0.104571E+02	SXY 0.678218E+02
		44	SXX	-0.750890E+02	SYY	0.452611E+01	SXY -0.540709E+02
33	NODE	47	SXX	0.429256E+02	SYY	0.128144E+00	SXY -0.299305E+02
		42	SXX	0.413977E+02	SYY	-0.836040E+01	SXY 0.436935E+02
		41	SXX	0.862901E+02	SYY	-0.279785E+00	SXY 0.428286E+02
		46	SXX	0.878180E+02	SYY	0.820876E+01	SXY -0.307923E+02
34	NODE	48	SXX	-0.116510E+01	SYY	-0.479108E+01	SXY -0.221993E+02
		43	SXX	-0.122141E+01	SYY	-0.510389E+01	SXY 0.510326E+02
		42	SXX	0.434318E+02	SYY	0.293369E+01	SXY 0.510020E+02

/-ELEMENT-//----------/

		47	SXX	0.434881E+02	SYY	0.324651E+01	SXY -0.222280E+02
35	NODE	49	SXX	-0.463829E+02	SYY	-0.110706E+02	SXY -0.243149E+02
		44	SXX	-0.446676E+02	SYY	-0.154104E+01	SXY 0.504110E+02
		43	SXX	0.896169E+00	SYY	0.666045E+01	SXY 0.513899E+02
		48	SXX	-0.819156E+00	SYY	-0.286914E+01	SXY -0.233330E+02
36	NODE	50	SXX	-0.926808E+02	SYY	-0.169949E+02	SXY -0.336946E+02
		45	SXX	-0.892664E+02	SYY	0.197418E+01	SXY 0.429664E+02
		44	SXX	-0.425219E+02	SYY	0.103882E+02	SXY 0.449207E+02
		49	SXX	-0.459363E+02	SYY	-0.858090E+01	SXY -0.317444E+02
37	NODE	52	SXX	0.146065E+02	SYY	0.285679E+01	SXY -0.519493E+01
		47	SXX	0.131507E+02	SYY	-0.523135E+01	SXY 0.175972E+02
		46	SXX	0.270479E+02	SYY	-0.272984E+01	SXY 0.167746E+02
		51	SXX	0.285038E+02	SYY	0.535830E+01	SXY -0.601871E+01
38	NODE	53	SXX	0.126410E+01	SYY	0.982369E+01	SXY 0.205386E+01
		48	SXX	-0.137330E+01	SYY	-0.482855E+01	SXY 0.267937E+02
		47	SXX	0.137129E+02	SYY	-0.211304E+01	SXY 0.252999E+02
		52	SXX	0.163503E+02	SYY	0.125392E+02	SXY 0.560214E+00
39	NODE	54	SXX	-0.122418E+02	SYY	0.205701E+02	SXY 0.218532E+01
		49	SXX	-0.169846E+02	SYY	-0.577893E+01	SXY 0.283565E+02
		48	SXX	-0.102736E+01	SYY	-0.290662E+01	SXY 0.256611E+02
		53	SXX	0.371547E+01	SYY	0.234424E+02	SXY -0.512119E+00
40	NODE	55	SXX	-0.298640E+02	SYY	0.282510E+02	SXY -0.769396E+01
		50	SXX	-0.361776E+02	SYY	-0.682433E+01	SXY 0.245161E+02
		49	SXX	-0.165380E+02	SYY	-0.328920E+01	SXY 0.209280E+02
		54	SXX	-0.102244E+02	SYY	0.317861E+02	SXY -0.112843E+02

LOADING - 1 END JOINT LOAD

MEMBER FORCES LOADING - 1

MEMBER	JOINT	FORCE AXIAL	FORCE SHEAR Y	FORCE SHEAR Z	MOMENT TORSIONAL	MOMENT BENDING Y	MOMENT BENDING Z
101	7	71.0397949					
102	12	66.1344910					
103	17	56.8314819					
104	22	50.0668335					
105	27	41.9527283					
106	32	34.5268707					
107	37	26.7562103					
108	42	19.1583557					
109	47	11.4849224					
110	52	3.7723179					

SUPPORT JOINT REACTION LOADS LOADING - 1

JOINT		FORCE X FORCE	FORCE Y FORCE	FORCE Z FORCE	MOMENT X MOMENT	MOMENT Y MOMENT	MOMENT Z MOMENT
1	GLOBAL	-618.703857	-234.930801				
2	GLOBAL	-761.511475	127.888626				
3	GLOBAL	17.0429382	122.700760				
4	GLOBAL	725.264648	127.330338				
5	GLOBAL	637.907715	-242.988922				

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
1	GLOBAL	0.0	0.0				
2	GLOBAL	0.0	0.0				
3	GLOBAL	0.0	0.0				
4	GLOBAL	0.0	0.0				
5	GLOBAL	0.0	0.0				

PAGE - 20

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
6	GLOBAL	0.0016873	0.0018377				
7	GLOBAL	0.0008165	0.0017688				
8	GLOBAL	-0.0000214	0.0017471				
9	GLOBAL	-0.0008595	0.0017711				
10	GLOBAL	-0.0017310	0.0018424				
11	GLOBAL	0.0031957	0.0068369				
12	GLOBAL	0.0015767	0.0067924				
13	GLOBAL	-0.0000418	0.0067777				
14	GLOBAL	-0.0016613	0.0067941				
15	GLOBAL	-0.0032787	0.0068402				
16	GLOBAL	0.0045401	0.0147448				
17	GLOBAL	0.0022300	0.0147022				
18	GLOBAL	-0.0000595	0.0146888				
19	GLOBAL	-0.0023487	0.0147036				
20	GLOBAL	-0.0046593	0.0147477				
21	GLOBAL	0.0056952	0.0251814				
22	GLOBAL	0.0028054	0.0251455				
23	GLOBAL	-0.0000746	0.0251337				
24	GLOBAL	-0.0029557	0.0251468				
25	GLOBAL	-0.0058442	0.0251840				
26	GLOBAL	0.0066783	0.0377849				
27	GLOBAL	0.0032876	0.0377550				
28	GLOBAL	-0.0000878	0.0377456				
29	GLOBAL	-0.0034630	0.0377562				
30	GLOBAL	-0.0068541	0.0377871				
31	GLOBAL	0.0074799	0.0521970				
32	GLOBAL	0.0036845	0.0521729				
33	GLOBAL	-0.0000983	0.0521651				
34	GLOBAL	-0.0038819	0.0521736				
35	GLOBAL	-0.0076757	0.0521985				
36	GLOBAL	0.0081040	0.0680535				
37	GLOBAL	0.0039921	0.0680357				
38	GLOBAL	-0.0001063	0.0680301				
39	GLOBAL	-0.0042049	0.0680364				
40	GLOBAL	-0.0083186	0.0680547				
41	GLOBAL	0.0085512	0.0849947				
42	GLOBAL	0.0042123	0.0849826				
43	GLOBAL	-0.0001134	0.0849788				
44	GLOBAL	-0.0044385	0.0849838				
45	GLOBAL	-0.0087735	0.0849977				
46	GLOBAL	0.0088169	0.1026615				
47	GLOBAL	0.0043443	0.1026556				
48	GLOBAL	-0.0001144	0.1026521				

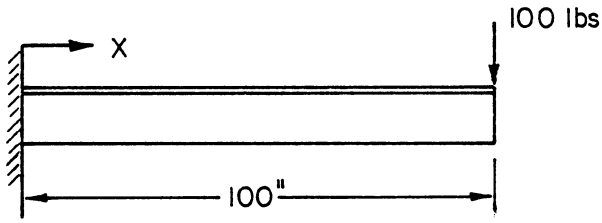
RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

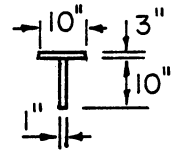
JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
49	GLOBAL	-0.0045750	0.1026500				
50	GLOBAL	-0.0090492	0.1026498				
51	GLOBAL	0.0089016	0.1206737				
52	GLOBAL	0.0043876	0.1206738				
53	GLOBAL	-0.0001159	0.1206812				
54	GLOBAL	-0.0046241	0.1206988				
55	GLOBAL	-0.0091568	0.1207246				

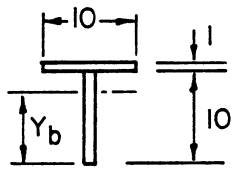
8.11.2 Example #2

Modelling of a 'T' beam

Consider a steel cantilever 'T' beam







$I = 235.42 \text{ in}^4$
$Y_b = 7.75$

Find the axial stress distribution at x = 50"

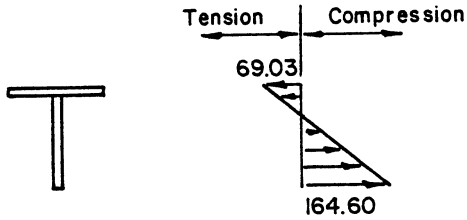
Finding the answer with the beam theory:

- Moment @ x = 50 $\quad M = 100 * 50 = 500$ lb-in

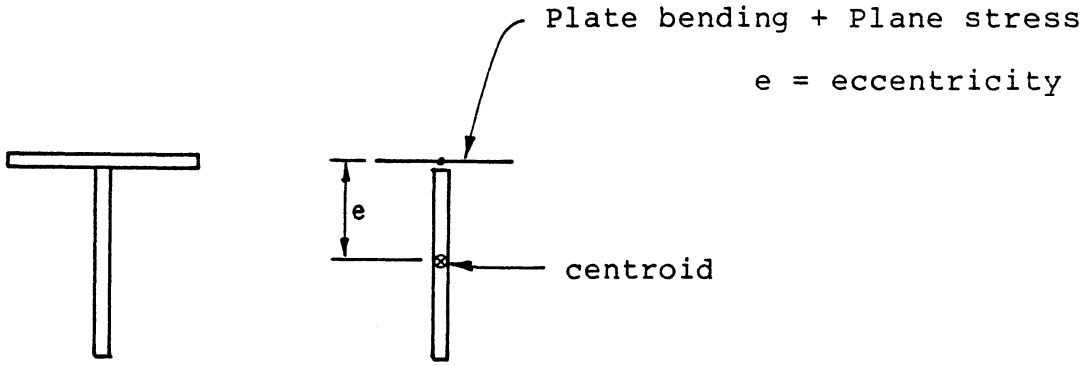
- displ @ x = 100 $\quad \delta = - PL3/3EI$
  $= - 100(100)3/3E(23542)$
  $= 0.00472$

  E = 30,000,000 psi

- Stress @ x = 500 $\quad \sigma x = My/I$
  $= 5000y/235.42$ $\quad \begin{cases} \text{Top: } 69.03 \\ \text{Bot: } 164.60 \end{cases}$

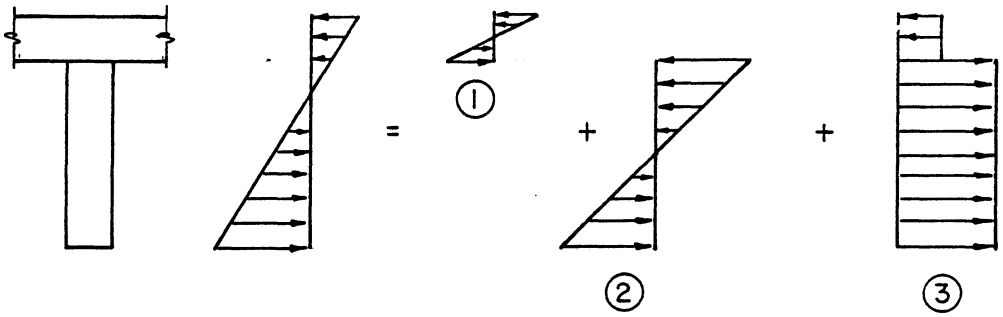


Modeling 1: Using
- Plate Bending : 'BPR'
- Plane Stress : 'IPLQCSH'
- BEAM : 'SPACE FRAME'
- MEMBER ECCENTRICITY



- The top plate with P applied normal to it can be modeled with a plate bending element.
- The web can be modelled with a beam member and member eccentricity to take into account the offset of the beam centroid.
- The offset of the beam's centroid will produce axial stress along the plane of the top plate, this degree of freedom can be modelled with a plane stress element.
- The member eccentricity extends a rigid link of length e defined from the midsurface of the flange plate to the centroid of the beam.

The normal strain distribution of this system would be

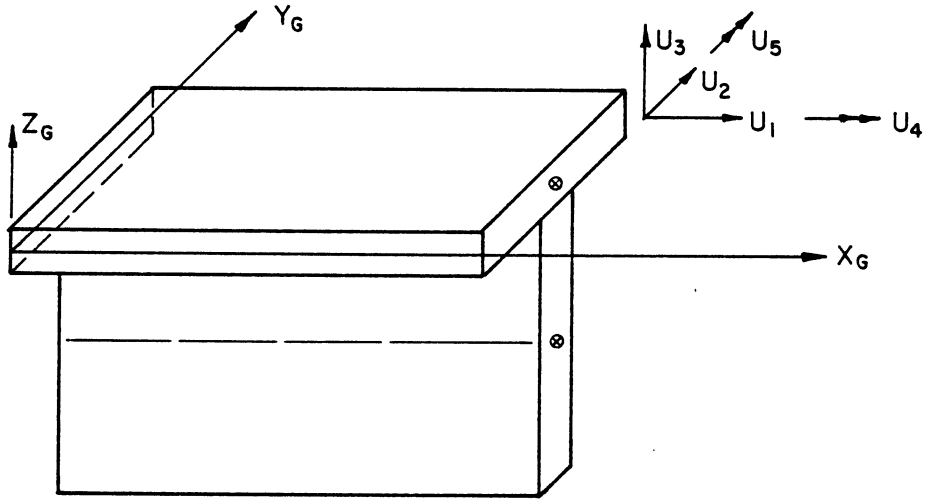


System 1 : plate bending

System 2 : beam bending

System 3 : member eccentricity

<u>The top plate:</u> BPR + IPLQCSH { 5 degrees of freedom { U_1, U_2, U_3 / U_4, U_5



The beam member: space frame has 6 degrees of freedom, $U_1, U_2, U_3, U_4, U_5, U_6$

Note: The U_6, or the rotation along the z, degree of freedom for the top plate is not existent. Hence, the top plate does not see the effect of the cause by the beam member. However, this degree of freedom does not contribute much to the system.

The following mesh layout is used.

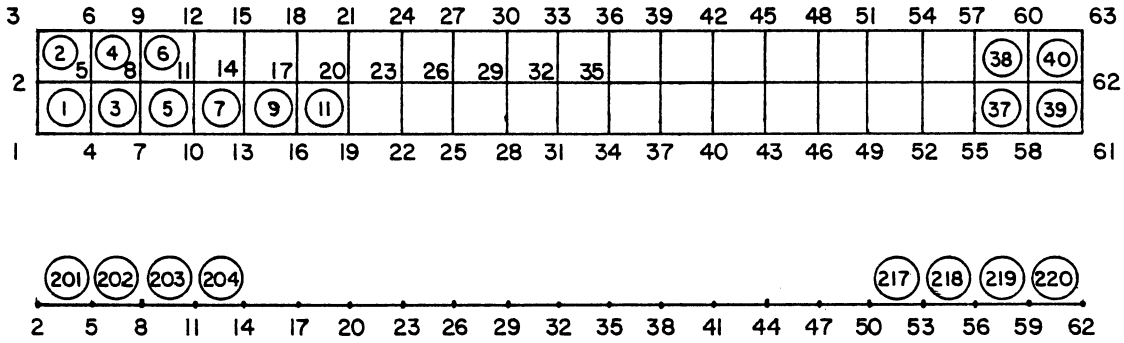


Plate Bending Elements: 1 to 40

Plane Stress Elements : 101 to 140

Frame Members : 201 to 220

Interpretation of Results

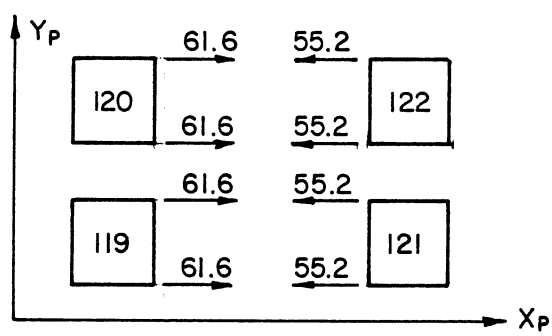
- The results of 'BPR' & 'IPCQCSH' are the same as discussed in previous sections, i.e., answers are in planar coordinates.

- The frame member answers are in local coordinates and with member eccentricity the answers are reported at the centroid of the member.

Plate Bending: from 'QQSTJTAV'

Joint	M_{xx} (lb-in)/in
33	1.77
32	1.77
31	1.77

Plane Stress:



Joint	x (psi)
33	58.4
32	58.4
31	58.4

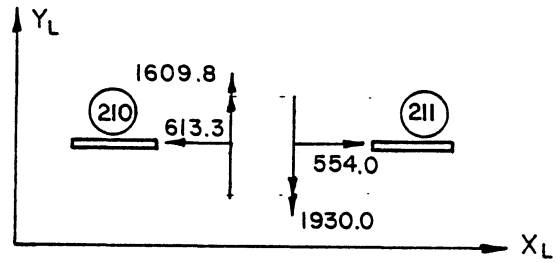
Beam:

for $\beta = 0°$

1) $X_L \not\parallel Y_G$

2) $Z_L \parallel XZ$ plane

(pp. 28 of Vol. 1 Frame Analysis)

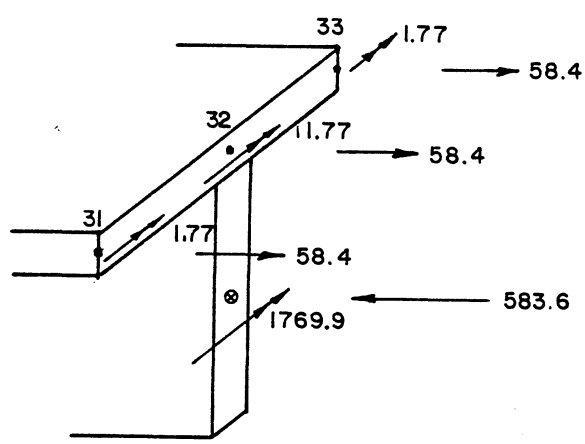


Joint	Axial (lb)	Bending Moment (lb-in)
32 @ Centroid of Beam	-583.6	1,769.9

Σ Moment along line 31-33

$= 1.77 \times 10 + 1769.9 + 583.6 \times 5.5$

$= 4997.4 \simeq 5000$ lb-in O.K.



The stress contribution from different systems is computed.

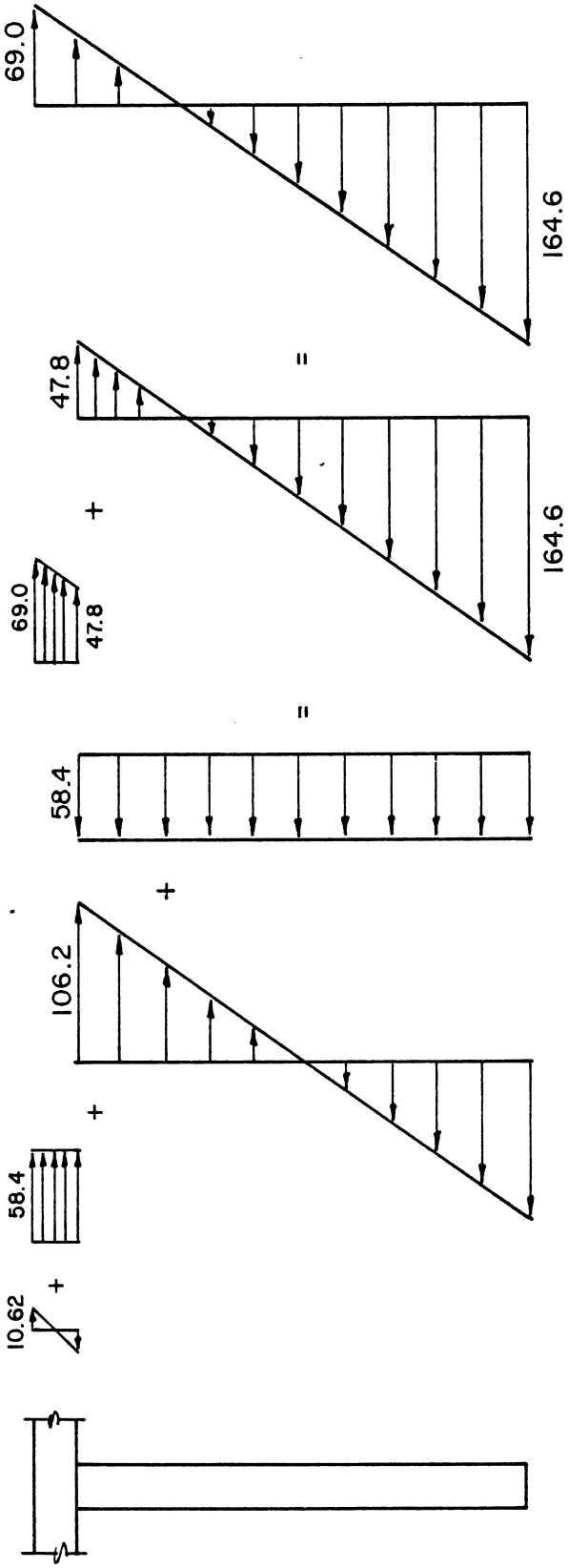


Plate Bending

$6M_{xx}/h^2$

$= 6(1.77)/1^2$

$= 10.62$

Plane Stress

58.4

Beam Bending

$\sigma = M_y/I = 1769.9*5/83.33$

$= 106.2$

Beam axial

$\sigma = P/A = 583.6/10$

$= 58.4$

```
STRUDL 'BEAM'   'T BEAM WITH ECCENTRICITY'
*****************************************************************
*                                                               *
*   MCAUTO STRUDL                          RELEASE 4.5  APR 1981  *
*   MCAUTO STRUDL DYNAL                    RELEASE 6.5            *
*   MCAUTO STRUDL PLOTS                    RELEASE 3.5            *
*                                                               *
*                                                               *
*                    TIME 13.22.16,  2/05/82                    *
*                                                               *
*                  DATA POOL SIZE   30640 BYTES                 *
*                                                               *
*****************************************************************


$                                          BDEROCBS10

$ RUN OF A CANTELEVER T BEAM UNDER A CONCENTRATED LOAD.

$ THIS EXAMPLE WILL ILLUSTRATE A RUN WHICH USES THE FOLLOWING

$ ELEMENTS:

$          - PLATE BENDING 'BPR'

$          - PLANE STRESS 'IPLQCSH'

$          - SPACE FRAME MEMBER

$          - MEMBER ECCENTRICITY

$

MESH COORDINATES

  1  TO  61  BY  3  X  0.  INCR  5.   Y -5.  Z  0.

  2  TO  62  BY  3  X  0.  INCR  5.   Y  0.  Z  0.

  3  TO  63  BY  3  X  0.  INCR  5.   Y  5.  Z  0.

TYPE PLATE BENDING

MESH INCIDENCES

1 TO 39 BY 2 / 1 TO 58 BY 3 / 4 TO 61 BY 3 / 5 TO 62 BY 3 / 2 TO 59 BY 3

2 TO 40 BY 2 / 2 TO 59 BY 3 / 5 TO 62 BY 3 / 6 TO 63 BY 3 / 3 TO 60 BY 3
```

```
TYPE PLANE STRESS

MESH INCIDENCES

 101 TO 139 BY 2 /  1 TO 58 BY 3 / 4 TO 61 BY 3 / 5 TO 62 BY 3 /  -
   2 TO  59 BY 3

 102 TO 140 BY 2 /  2 TO 59 BY 3 / 5 TO 62 BY 3 / 6 TO 63 BY 3 /  -
   3 TO  60 BY 3

TYPE SPACE FRAME

MESH INCIDENCES

 201 TO 220 / 2 TO 59 BY 3 / 5 TO 62 BY 3

ELEMENT PROPERTIES

  1 TO  40 TYPE 'BPR'     THICKNESS 1.

101 TO 140 TYPE 'IPLQCSH' THICKNESS 1.

MEMBER PROPERTIES PRISMATIC AX 10.  IY 83.33  IX 3.10  IZ  0.83

  201 TO 220

CONSTANTS

E  30000000.   ALL

POISSON  0.3   ALL

G 11540000.    ALL

SUPPORT JOINTS  1  2  3

MEMBER  201 TO 220 ECCENTRICITY  GLOBAL START  Z -5.5  END  Z -5.5

LOADING 1 'POINT LOAD AT END OF BEAM'

  JOINT 62 LOAD FORCE Z -100.

PRINT STRUCTURE DATA
```

```
****************************************
*  PROBLEM DATA FROM INTERNAL STORAGE  *
****************************************
```

JOB ID - BEAM JOB TITLE - T BEAM WITH ECCENTRICITY

ACTIVE UNITS -	LENGTH	FORCE	ANGLE	TEMPERATURE	TIME	MASS
	INCH	LB	RAD	FAHR	SEC	LBM

********** STRUCTURAL DATA **********

JOINT COORDINATE REFERENCE SYSTEMS ----------/

ID.	ORIGIN X	Y	Z	ROTAT. R1	R2	R3

JOINT COORDINATES----------/				STATUS---/		
JOINT	X	Y	Z	CONDITION		
1	0.0	-5.000	0.0	SUPPORT	ACTIVE	GLOBAL
4	5.000	-5.000	0.0		ACTIVE	GLOBAL
7	10.000	-5.000	0.0		ACTIVE	GLOBAL
10	15.000	-5.000	0.0		ACTIVE	GLOBAL
13	20.000	-5.000	0.0		ACTIVE	GLOBAL
16	25.000	-5.000	0.0		ACTIVE	GLOBAL
19	30.000	-5.000	0.0		ACTIVE	GLOBAL
22	35.000	-5.000	0.0		ACTIVE	GLOBAL
25	40.000	-5.000	0.0		ACTIVE	GLOBAL
28	45.000	-5.000	0.0		ACTIVE	GLOBAL
31	50.000	-5.000	0.0		ACTIVE	GLOBAL
34	55.000	-5.000	0.0		ACTIVE	GLOBAL
37	60.000	-5.000	0.0		ACTIVE	GLOBAL
40	65.000	-5.000	0.0		ACTIVE	GLOBAL
43	70.000	-5.000	0.0		ACTIVE	GLOBAL
46	75.000	-5.000	0.0		ACTIVE	GLOBAL
49	80.000	-5.000	0.0		ACTIVE	GLOBAL
52	85.000	-5.000	0.0		ACTIVE	GLOBAL
55	90.000	-5.000	0.0		ACTIVE	GLOBAL
58	95.000	-5.000	0.0		ACTIVE	GLOBAL
61	100.000	-5.000	0.0		ACTIVE	GLOBAL
2	0.0	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
5	5.000	0.0	0.0		ACTIVE	GLOBAL
8	10.000	0.0	0.0		ACTIVE	GLOBAL
11	15.000	0.0	0.0		ACTIVE	GLOBAL
14	20.000	0.0	0.0		ACTIVE	GLOBAL

17	25.000	0.0	0.0		ACTIVE	GLOBAL
20	30.000	0.0	0.0		ACTIVE	GLOBAL
23	35.000	0.0	0.0		ACTIVE	GLOBAL
26	40.000	0.0	0.0		ACTIVE	GLOBAL
29	45.000	0.0	0.0		ACTIVE	GLOBAL
32	50.000	0.0	0.0		ACTIVE	GLOBAL
35	55.000	0.0	0.0		ACTIVE	GLOBAL
38	60.000	0.0	0.0		ACTIVE	GLOBAL
41	65.000	0.0	0.0		ACTIVE	GLOBAL
44	70.000	0.0	0.0		ACTIVE	GLOBAL
47	75.000	0.0	0.0		ACTIVE	GLOBAL
50	80.000	0.0	0.0		ACTIVE	GLOBAL
53	85.000	0.0	0.0		ACTIVE	GLOBAL
56	90.000	0.0	0.0		ACTIVE	GLOBAL
59	95.000	0.0	0.0		ACTIVE	GLOBAL
62	100.000	0.0	0.0		ACTIVE	GLOBAL
3	0.0	5.000	0.0	SUPPORT	ACTIVE	GLOBAL
6	5.000	5.000	0.0		ACTIVE	GLOBAL
9	10.000	5.000	0.0		ACTIVE	GLOBAL
12	15.000	5.000	0.0		ACTIVE	GLOBAL
15	20.000	5.000	0.0		ACTIVE	GLOBAL
18	25.000	5.000	0.0		ACTIVE	GLOBAL
21	30.000	5.000	0.0		ACTIVE	GLOBAL
24	35.000	5.000	0.0		ACTIVE	GLOBAL
27	40.000	5.000	0.0		ACTIVE	GLOBAL
30	45.000	5.000	0.0		ACTIVE	GLOBAL
33	50.000	5.000	0.0		ACTIVE	GLOBAL
36	55.000	5.000	0.0		ACTIVE	GLOBAL
39	60.000	5.000	0.0		ACTIVE	GLOBAL
42	65.000	5.000	0.0		ACTIVE	GLOBAL
45	70.000	5.000	0.0		ACTIVE	GLOBAL
48	75.000	5.000	0.0		ACTIVE	GLOBAL
51	80.000	5.000	0.0		ACTIVE	GLOBAL
54	85.000	5.000	0.0		ACTIVE	GLOBAL
57	90.000	5.000	0.0		ACTIVE	GLOBAL
60	95.000	5.000	0.0		ACTIVE	GLOBAL
63	100.000	5.000	0.0		ACTIVE	GLOBAL

JOINT RELEASES----------/ELASTIC SUPPORT RELEASES----------/

JOINT	FORCE	MOMENT	THETA 1	THETA 2	THETA 3	KFX	KFY	KFZ	KMX	KMY	KMZ

MEMBER INCIDENCES----------/--LENGTH-----/---------RELEASES----------/--STATUS--/-----TYPE---------/

MEMBER	START	END	LOCAL COORD.	START FORCE	START MOMENT	END FORCE	END MOMENT

201	2	5	5.000	ACTIVE	SPACE	FRAME
202	5	8	5.000	ACTIVE	SPACE	FRAME
203	8	11	5.000	ACTIVE	SPACE	FRAME
204	11	14	5.000	ACTIVE	SPACE	FRAME
205	14	17	5.000	ACTIVE	SPACE	FRAME
206	17	20	5.000	ACTIVE	SPACE	FRAME
207	20	23	5.000	ACTIVE	SPACE	FRAME
208	23	26	5.000	ACTIVE	SPACE	FRAME
209	26	29	5.000	ACTIVE	SPACE	FRAME
210	29	32	5.000	ACTIVE	SPACE	FRAME
211	32	35	5.000	ACTIVE	SPACE	FRAME
212	35	38	5.000	ACTIVE	SPACE	FRAME
213	38	41	5.000	ACTIVE	SPACE	FRAME
214	41	44	5.000	ACTIVE	SPACE	FRAME
215	44	47	5.000	ACTIVE	SPACE	FRAME
216	47	50	5.000	ACTIVE	SPACE	FRAME
217	50	53	5.000	ACTIVE	SPACE	FRAME
218	53	56	5.000	ACTIVE	SPACE	FRAME
219	56	59	5.000	ACTIVE	SPACE	FRAME
220	59	62	5.000	ACTIVE	SPACE	FRAME

ELEMENT INCIDENCES----------/--STATUS--/-----/----TYPE----/

ELEMENT	NODES					
1	1	4	5	2	ACTIVE	BPR
3	4	7	8	5	ACTIVE	BPR
5	7	10	11	8	ACTIVE	BPR
7	10	13	14	11	ACTIVE	BPR
9	13	16	17	14	ACTIVE	BPR
11	16	19	20	17	ACTIVE	BPR
13	19	22	23	20	ACTIVE	BPR
15	22	25	26	23	ACTIVE	BPR
17	25	28	29	26	ACTIVE	BPR
19	28	31	32	29	ACTIVE	BPR
21	31	34	35	32	ACTIVE	BPR
23	34	37	38	35	ACTIVE	BPR
25	37	40	41	38	ACTIVE	BPR
27	40	43	44	41	ACTIVE	BPR
29	43	46	47	44	ACTIVE	BPR
31	46	49	50	47	ACTIVE	BPR
33	49	52	53	50	ACTIVE	BPR
35	52	55	56	53	ACTIVE	BPR
37	55	58	59	56	ACTIVE	BPR
39	58	61	62	59	ACTIVE	BPR
2	2	5	6	3	ACTIVE	BPR
4	5	8	9	6	ACTIVE	BPR
6	8	11	12	9	ACTIVE	BPR
8						

PAGE - 7

	11	14	15	12	ACTIVE	BPR
10	14	17	18	15	ACTIVE	BPR
12	17	20	21	18	ACTIVE	BPR
14	20	23	24	21	ACTIVE	BPR
16	23	26	27	24	ACTIVE	BPR
18	26	29	30	27	ACTIVE	BPR
20	29	32	33	30	ACTIVE	BPR
22	32	35	36	33	ACTIVE	BPR
24	35	38	39	36	ACTIVE	BPR
26	38	41	42	39	ACTIVE	BPR
28	41	44	45	42	ACTIVE	BPR
30	44	47	48	45	ACTIVE	BPR
32	47	50	51	48	ACTIVE	BPR
34	50	53	54	51	ACTIVE	BPR
36	53	56	57	54	ACTIVE	BPR
38	56	59	60	57	ACTIVE	BPR
40	59	62	63	60	ACTIVE	BPR
101	1	4	5	2	ACTIVE	IPLQCSH
103	4	7	8	5	ACTIVE	IPLQCSH
105	7	10	11	8	ACTIVE	IPLQCSH
107	10	13	14	11	ACTIVE	IPLQCSH
109	13	16	17	14	ACTIVE	IPLQCSH
111	16	19	20	17	ACTIVE	IPLQCSH
113	19	22	23	20	ACTIVE	IPLQCSH
115	22	25	26	23	ACTIVE	IPLQCSH
117	25	28	29	26	ACTIVE	IPLQCSH
119	28	31	32	29	ACTIVE	IPLQCSH
121	31	34	35	32	ACTIVE	IPLQCSH
123	34	37	38	35	ACTIVE	IPLQCSH
125	37	40	41	38	ACTIVE	IPLQCSH
127	40	43	44	41	ACTIVE	IPLQCSH
129	43	46	47	44	ACTIVE	IPLQCSH
131	46	49	50	47	ACTIVE	IPLQCSH
133	49	52	53	50	ACTIVE	IPLQCSH
135	52	55	56	53	ACTIVE	IPLQCSH
137	55	58	59	56	ACTIVE	IPLQCSH
139	58	61	62	59	ACTIVE	IPLQCSH
102	2	5	6	3	ACTIVE	IPLQCSH
104	5	8	9	6	ACTIVE	IPLQCSH
106	8	11	12	9	ACTIVE	IPLQCSH
108	11	14	15	12	ACTIVE	IPLQCSH
110	14	17	18	15	ACTIVE	IPLQCSH
112	17	20	21	18	ACTIVE	IPLQCSH
114	20	23	24	21	ACTIVE	IPLQCSH
116	23	26	27	24	ACTIVE	IPLQCSH
118	26	29	30	27	ACTIVE	IPLQCSH
120	29	32	33	30	ACTIVE	IPLQCSH
122	32	35	36	33	ACTIVE	IPLQCSH
124	35	38	39	36	ACTIVE	IPLQCSH
126						

	38	41	42	39	ACTIVE	IPLQCSH
128	41	44	45	42	ACTIVE	IPLQCSH
130	44	47	48	45	ACTIVE	IPLQCSH
132	47	50	51	48	ACTIVE	IPLQCSH
134	50	53	54	51	ACTIVE	IPLQCSH
136	53	56	57	54	ACTIVE	IPLQCSH
138	56	59	60	57	ACTIVE	IPLQCSH
140	59	62	63	60	ACTIVE	IPLQCSH

MEMBER PROPERTIES----------/

MEMBER/SEG	TYPE	SEG.L	COMP	AX YD	AY ZD PHI	AZ YC ID/TYPE	IX ZC OD/SPAC	IY EY TH-PIPE	IZ EZ R	IYZ FLTK ALPHA	SY WBTK FC	SZ THICK SC
201	PRISMATIC			10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
202	PRISMATIC			10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
203	PRISMATIC			10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
204	PRISMATIC			10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
205	PRISMATIC			10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
206	PRISMATIC			10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
207	PRISMATIC			10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
208	PRISMATIC			10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
209	PRISMATIC			10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
210	PRISMATIC			10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
211	PRISMATIC			10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					0.0	WF	0.0					
212	PRISMATIC											

		10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			0.0	WF	0.0					
213	PRISMATIC	10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			0.0	WF	0.0					
214	PRISMATIC	10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			0.0	WF	0.0					
215	PRISMATIC	10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			0.0	WF	0.0					
216	PRISMATIC	10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			0.0	WF	0.0					
217	PRISMATIC	10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			0.0	WF	0.0					
218	PRISMATIC	10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			0.0	WF	0.0					
219	PRISMATIC	10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			0.0	WF	0.0					
220	PRISMATIC	10.000	0.0	0.0	3.100	83.330	0.830	0.0	0.0	0.0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			0.0	WF	0.0					

ELEMENT PROPERTIES----------/

ELEMENT	TYPE	THICKNESS	/--------CURVATURES--------/			/----------THERMAL EXPANSION COEFFICIENTS----------/					
			K1	K2	K12	CAX	CAY	CAZ	CSXY	CSXZ	CSYZ
1	BPR	1.000									
3	BPR	1.000									
5	BPR	1.000									
7	BPR	1.000									
9	BPR	1.000									
11	BPR	1.000									
13	BPR	1.000									
15	BPR	1.000									
17	BPR	1.000									
19	BPR	1.000									
21	BPR	1.000									
23	BPR	1.000									
25	BPR	1.000									
27											

	BPR	1.000
29	BPR	1.000
31	BPR	1.000
33	BPR	1.000
35	BPR	1.000
37	BPR	1.000
39	BPR	1.000
2	BPR	1.000
4	BPR	1.000
6	BPR	1.000
8	BPR	1.000
10	BPR	1.000
12	BPR	1.000
14	BPR	1.000
16	BPR	1.000
18	BPR	1.000
20	BPR	1.000
22	BPR	1.000
24	BPR	1.000
26	BPR	1.000
28	BPR	1.000
30	BPR	1.000
32	BPR	1.000
34	BPR	1.000
36	BPR	1.000
38	BPR	1.000
40	BPR	1.000
101	IPLQCSH	1.000
103	IPLQCSH	1.000
105	IPLQCSH	1.000
107	IPLQCSH	1.000
109	IPLQCSH	1.000
111	IPLQCSH	1.000
113	IPLQCSH	1.000
115	IPLQCSH	1.000
117	IPLQCSH	1.000
119	IPLQCSH	1.000
121	IPLQCSH	1.000
123	IPLQCSH	1.000
125	IPLQCSH	1.000
127	IPLQCSH	1.000
129	IPLQCSH	1.000
131	IPLQCSH	1.000
133	IPLQCSH	1.000
135	IPLQCSH	1.000
137	IPLQCSH	1.000
139	IPLQCSH	1.000
102	IPLQCSH	1.000
104	IPLQCSH	1.000
106		

	IPLQCSH	1.000
108	IPLQCSH	1.000
110	IPLQCSH	1.000
112	IPLQCSH	1.000
114	IPLQCSH	1.000
116	IPLQCSH	1.000
118	IPLQCSH	1.000
120	IPLQCSH	1.000
122	IPLQCSH	1.000
124	IPLQCSH	1.000
126	IPLQCSH	1.000
128	IPLQCSH	1.000
130	IPLQCSH	1.000
132	IPLQCSH	1.000
134	IPLQCSH	1.000
136	IPLQCSH	1.000
138	IPLQCSH	1.000
140	IPLQCSH	1.000

MEMBER END ECCENTRICITIES----------/--END JOINT SIZES--/

MEMBER		START X	START Y	START Z	END X	END Y	END Z	START	END
201	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
202	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
203	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
204	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
205	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
206	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
207	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
208	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
209	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
210	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
211	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
212	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
213	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
214	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
215	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
216	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
217	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
218	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
219	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0
220	GLOBAL	0.0	0.0	-5.500	0.0	0.0	-5.500	0.0	0.0

MEMBER CONSTANTS----------/

CONSTANT	STANDARD VALUE	DOMAIN	VALUE	MEMBER LIST

PAGE - 12

```
   E          0.300000E+08    ALL
   G          0.115400E+08    ALL
DENSITY       0.999999E+00    ALL
  CTE         0.100000E+01    ALL
  BETA        0.0             ALL
POISSON       0.300000E+00    ALL


****************************************
*  END OF DATA FROM  INTERNAL STORAGE  *
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PAGE - 15

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STIFFNESS ANALYSIS REDUCE BAND
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PAGE - 16

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LIST FORCES DISPLACEMENTS STRESSES REACTIONS ALL
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****************************
*RESULTS OF LATEST ANALYSES*
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PROBLEM - BEAM TITLE - T BEAM WITH ECCENTRICITY

ACTIVE UNITS INCH LB RAD FAHR SEC LBM

LOADING - 1 POINT LOAD AT END OF BEAM

/-ELEMENT-//												
1	NODE	1	MXX	2.680602E+00	MYY	8.041806E-01	MXY	3.397219E-01	VX	5.944562E-02	VY	2.688876E-01
	NODE	4	MXX	3.902044E+00	MYY	-3.086376E-02	MXY	5.212482E-01	VX	5.944562E-02	VY	4.464388E-02
	NODE	5	MXX	3.390956E+00	MYY	7.704093E-01	MXY	-3.581119E-02	VX	-1.647981E-01	VY	4.464388E-02
	NODE	2	MXX	4.025043E+00	MYY	1.207512E+00	MXY	-2.173374E-01	VX	-1.647981E-01	VY	2.688876E-01
3	NODE	4	MXX	3.599957E+00	MYY	-1.214895E-01	MXY	1.961464E-01	VX	-2.361022E-03	VY	1.933751E-01
	NODE	7	MXX	3.404038E+00	MYY	5.908394E-02	MXY	4.432973E-02	VX	-2.361022E-03	VY	-4.339780E-02
	NODE	8	MXX	3.092798E+00	MYY	8.823282E-02	MXY	-9.158534E-02	VX	-2.391338E-01	VY	-4.339780E-02
	NODE	5	MXX	3.832525E+00	MYY	9.028798E-01	MXY	6.023131E-02	VX	-2.391338E-01	VY	1.933751E-01
5	NODE	7	MXX	3.310344E+00	MYY	3.097057E-02	MXY	2.557148E-02	VX	-3.683558E-02	VY	3.684849E-02
	NODE	10	MXX	3.086610E+00	MYY	1.527214E-02	MXY	-4.627800E-02	VX	-3.683558E-02	VY	-5.085437E-02
	NODE	11	MXX	2.831912E+00	MYY	-6.058574E-02	MXY	-5.363847E-02	VX	-1.245384E-01	VY	-5.085437E-02
	NODE	8	MXX	3.400331E+00	MYY	1.804974E-01	MXY	1.821101E-02	VX	-1.245384E-01	VY	3.684849E-02
7	NODE	10	MXX	2.969140E+00	MYY	-1.996970E-02	MXY	-6.440234E-02	VX	-4.971359E-03	VY	4.262883E-02
	NODE	13	MXX	2.896577E+00	MYY	2.027839E-02	MXY	-7.425851E-02	VX	-4.971359E-03	VY	-5.074269E-02
	NODE	14	MXX	2.651974E+00	MYY	-6.494689E-02	MXY	-3.132095E-02	VX	-9.834290E-02	VY	-5.074269E-02
	NODE	11	MXX	3.181859E+00	MYY	4.439831E-02	MXY	-2.146483E-02	VX	-9.834290E-02	VY	4.262883E-02
9	NODE	13	MXX	2.759258E+00	MYY	-2.092201E-02	MXY	-7.333332E-02	VX	9.052940E-04	VY	4.718442E-02
	NODE	16	MXX	2.723355E+00	MYY	2.066645E-02	MXY	-7.172698E-02	VX	9.052940E-04	VY	-4.954306E-02
	NODE	17	MXX	2.478004E+00	MYY	-5.581343E-02	MXY	-2.792742E-02	VX	-9.582216E-02	VY	-4.954306E-02
	NODE	14	MXX	3.004284E+00	MYY	4.075128E-02	MXY	-2.953373E-02	VX	-9.582216E-02	VY	4.718442E-02
11	NODE	16	MXX	2.581841E+00	MYY	-2.162814E-02	MXY	-7.106209E-02	VX	1.393184E-03	VY	4.916563E-02

PAGE - 18

/-ELEMENT-//----------/

	NODE	19	MXX	2.548160E+00	MYY	2.110863E-02	MXY	-7.003784E-02	VX	1.393184E-03	VY	-4.929657E-02
	NODE	20	MXX	2.301881E+00	MYY	-5.303991E-02	MXY	-2.834131E-02	VX	-9.706897E-02	VY	-4.929657E-02
	NODE	17	MXX	2.829971E+00	MYY	4.981691E-02	MXY	-2.936554E-02	VX	-9.706897E-02	VY	4.916563E-02
13	NODE	19	MXX	2.406530E+00	MYY	-2.143550E-02	MXY	-6.982476E-02	VX	1.228079E-03	VY	4.948670E-02
	NODE	22	MXX	2.371712E+00	MYY	2.136719E-02	MXY	-6.960642E-02	VX	1.228079E-03	VY	-4.946387E-02
	NODE	23	MXX	2.124629E+00	MYY	-5.306667E-02	MXY	-2.870581E-02	VX	-9.772247E-02	VY	-4.946387E-02
	NODE	20	MXX	2.654081E+00	MYY	5.267531E-02	MXY	-2.892408E-02	VX	-9.772247E-02	VY	4.948670E-02
15	NODE	22	MXX	2.230242E+00	MYY	-2.117229E-02	MXY	-6.955844E-02	VX	1.048736E-03	VY	4.932231E-02
	NODE	25	MXX	2.194615E+00	MYY	2.127057E-02	MXY	-6.955290E-02	VX	1.048736E-03	VY	-4.940734E-02
	NODE	26	MXX	1.947799E+00	MYY	-5.306298E-02	MXY	-2.875100E-02	VX	-9.768093E-02	VY	-4.940734E-02
	NODE	23	MXX	2.476938E+00	MYY	5.272418E-02	MXY	-2.875660E-02	VX	-9.768093E-02	VY	4.932231E-02
17	NODE	25	MXX	2.053393E+00	MYY	-2.113581E-02	MXY	-6.954521E-02	VX	9.775683E-04	VY	4.926329E-02
	NODE	28	MXX	2.017484E+00	MYY	2.112806E-02	MXY	-6.956762E-02	VX	9.775683E-04	VY	-4.935782E-02
	NODE	29	MXX	1.770821E+00	MYY	-5.303413E-02	MXY	-2.875254E-02	VX	-9.764355E-02	VY	-4.935782E-02
	NODE	26	MXX	2.299871E+00	MYY	5.259848E-02	MXY	-2.873015E-02	VX	-9.764355E-02	VY	4.926329E-02
19	NODE	28	MXX	1.876209E+00	MYY	-2.137256E-02	MXY	-6.959558E-02	VX	1.075711E-03	VY	4.938306E-02
	NODE	31	MXX	1.840641E+00	MYY	2.118725E-02	MXY	-6.961346E-02	VX	1.075711E-03	VY	-4.943090E-02
	NODE	32	MXX	1.593674E+00	MYY	-5.314654E-02	MXY	-2.878899E-02	VX	-9.773827E-02	VY	-4.943090E-02
	NODE	29	MXX	2.123069E+00	MYY	5.275804E-02	MXY	-2.877108E-02	VX	-9.773827E-02	VY	4.938306E-02
21	NODE	31	MXX	1.699279E+00	MYY	-2.129984E-02	MXY	-6.960839E-02	VX	1.035776E-03	VY	4.934785E-02
	NODE	34	MXX	1.663545E+00	MYY	2.116787E-02	MXY	-6.960839E-02	VX	1.035776E-03	VY	-4.943649E-02
	NODE	35	MXX	1.416604E+00	MYY	-5.323070E-02	MXY	-2.878290E-02	VX	-9.774852E-02	VY	-4.943649E-02
	NODE	32	MXX	1.946085E+00	MYY	5.265510E-02	MXY	-2.878290E-02	VX	-9.774852E-02	VY	4.934785E-02
23	NODE	34	MXX	1.522372E+00	MYY	-2.130806E-02	MXY	-6.959641E-02	VX	9.853728E-04	VY	4.932334E-02
	NODE	37	MXX	1.486454E+00	MYY	2.101493E-02	MXY	-6.959641E-02	VX	9.853728E-04	VY	-4.936516E-02
	NODE	38	MXX	1.239721E+00	MYY	-5.312741E-02	MXY	-2.877248E-02	VX	-9.770316E-02	VY	-4.936516E-02
	NODE	35	MXX	1.769040E+00	MYY	5.262434E-02	MXY	-2.877248E-02	VX	-9.770316E-02	VY	4.932334E-02
25	NODE	37	MXX	1.345177E+00	MYY	-2.150148E-02	MXY	-6.961554E-02	VX	1.080114E-03	VY	4.939286E-02
	NODE	40	MXX	1.309616E+00	MYY	2.108037E-02	MXY	-6.961554E-02	VX	1.080114E-03	VY	-4.940899E-02
	NODE	41	MXX	1.062737E+00	MYY	-5.320048E-02	MXY	-2.879262E-02	VX	-9.772170E-02	VY	-4.940899E-02
	NODE	38	MXX	1.592029E+00	MYY	5.269802E-02	MXY	-2.879262E-02	VX	-9.772170E-02	VY	4.939286E-02
27	NODE	40	MXX	1.168298E+00	MYY	-2.141380E-02	MXY	-6.961107E-02	VX	1.038983E-03	VY	4.933938E-02
	NODE	43	MXX	1.132568E+00	MYY	2.106982E-02	MXY	-6.962889E-02	VX	1.038983E-03	VY	-4.941367E-02
	NODE	44	MXX	8.857100E-01	MYY	-5.326015E-02	MXY	-2.880123E-02	VX	-9.771401E-02	VY	-4.941367E-02
	NODE	41	MXX	1.415010E+00	MYY	5.258065E-02	MXY	-2.878332E-02	VX	-9.771401E-02	VY	4.933938E-02
29	NODE	43	MXX	9.913499E-01	MYY	-2.140713E-02	MXY	-6.963056E-02	VX	1.023464E-03	VY	4.931939E-02
	NODE	46	MXX	9.555956E-01	MYY	2.099895E-02	MXY	-6.968427E-02	VX	1.023464E-03	VY	-4.937836E-02
	NODE	47	MXX	7.087651E-01	MYY	-5.312926E-02	MXY	-2.882460E-02	VX	-9.767431E-02	VY	-4.937836E-02

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	NODE	44	MXX	1.237985E+00	MYY	5.253357E-02	MXY	-2.877087E-02	VX	-9.767431E-02	VY	4.931939E-02
31	NODE	46	MXX	8.142286E-01	MYY	-2.150881E-02	MXY	-6.971836E-02	VX	1.075316E-03	VY	4.937147E-02
	NODE	49	MXX	7.786603E-01	MYY	2.104902E-02	MXY	-6.975418E-02	VX	1.075316E-03	VY	-4.935242E-02
	NODE	50	MXX	5.318487E-01	MYY	-5.293036E-02	MXY	-2.882928E-02	VX	-9.764856E-02	VY	-4.935242E-02
	NODE	47	MXX	1.060996E+00	MYY	5.263752E-02	MXY	-2.879347E-02	VX	-9.764856E-02	VY	4.937147E-02
33	NODE	49	MXX	6.374531E-01	MYY	-2.138871E-02	MXY	-6.973350E-02	VX	7.348694E-04	VY	4.933098E-02
	NODE	52	MXX	6.000845E-01	MYY	2.075636E-02	MXY	-6.930357E-02	VX	7.348694E-04	VY	-4.912163E-02
	NODE	53	MXX	3.547686E-01	MYY	-5.321848E-02	MXY	-2.848984E-02	VX	-9.771776E-02	VY	-4.912163E-02
	NODE	50	MXX	8.839427E-01	MYY	5.277330E-02	MXY	-2.891967E-02	VX	-9.771776E-02	VY	4.933098E-02
35	NODE	52	MXX	4.596615E-01	MYY	-2.139550E-02	MXY	-6.832999E-02	VX	-7.928312E-04	VY	4.897074E-02
	NODE	55	MXX	4.162403E-01	MYY	1.687205E-02	MXY	-6.532109E-02	VX	-7.928312E-04	VY	-4.783722E-02
	NODE	56	MXX	1.788504E-01	MYY	-5.668008E-02	MXY	-2.663530E-02	VX	-9.760076E-02	VY	-4.783722E-02
	NODE	53	MXX	7.047695E-01	MYY	5.180657E-02	MXY	-2.964419E-02	VX	-9.760076E-02	VY	4.897074E-02
37	NODE	55	MXX	2.770888E-01	MYY	-2.492219E-02	MXY	-6.247652E-02	VX	-2.198249E-03	VY	5.133704E-02
	NODE	58	MXX	2.200612E-01	MYY	1.781662E-02	MXY	-4.642912E-02	VX	-2.198249E-03	VY	-5.410727E-02
	NODE	59	MXX	-1.040588E-02	MYY	-1.034134E-01	MXY	-1.956679E-02	VX	-1.076425E-01	VY	-5.410727E-02
	NODE	56	MXX	5.354954E-01	MYY	5.036205E-02	MXY	-3.561420E-02	VX	-1.076425E-01	VY	5.133704E-02
39	NODE	58	MXX	7.527298E-02	MYY	-2.600291E-02	MXY	-3.357672E-02	VX	7.651221E-03	VY	4.480756E-02
	NODE	61	MXX	9.029609E-02	MYY	8.707047E-03	MXY	-3.019178E-02	VX	7.651221E-03	VY	-7.887685E-02
	NODE	62	MXX	-2.175556E-01	MYY	-1.961409E-01	MXY	-3.048505E-02	VX	-1.160331E-01	VY	-7.887685E-02
	NODE	59	MXX	3.387908E-01	MYY	1.728535E-03	MXY	-3.387003E-02	VX	-1.160331E-01	VY	4.480756E-02
2	NODE	2	MXX	4.025044E+00	MYY	1.207513E+00	MXY	2.173333E-01	VX	-1.647928E-01	VY	-2.688451E-01
	NODE	5	MXX	3.390965E+00	MYY	7.704390E-01	MXY	3.588220E-02	VX	-1.647928E-01	VY	-4.465383E-02
	NODE	6	MXX	3.902039E+00	MYY	-3.088760E-02	MXY	-5.211752E-01	VX	5.939853E-02	VY	-4.465383E-02
	NODE	3	MXX	2.680817E+00	MYY	8.042450E-01	MXY	-3.397241E-01	VX	5.939853E-02	VY	-2.688451E-01
4	NODE	5	MXX	3.832520E+00	MYY	9.029052E-01	MXY	-6.015605E-02	VX	-2.391285E-01	VY	-1.933743E-01
	NODE	8	MXX	3.092823E+00	MYY	8.826399E-02	MXY	9.167516E-02	VX	-2.391285E-01	VY	4.338775E-02
	NODE	9	MXX	3.404034E+00	MYY	5.907440E-02	MXY	-4.423605E-02	VX	-2.366677E-03	VY	4.338775E-02
	NODE	6	MXX	3.599992E+00	MYY	-1.215010E-01	MXY	-1.960673E-01	VX	-2.366677E-03	VY	-1.933743E-01
6	NODE	8	MXX	3.400318E+00	MYY	1.805083E-01	MXY	-1.811975E-02	VX	-1.245318E-01	VY	-3.684627E-02
	NODE	11	MXX	2.831937E+00	MYY	-6.056541E-02	MXY	5.372858E-02	VX	-1.245318E-01	VY	5.084536E-02
	NODE	12	MXX	3.086597E+00	MYY	1.526737E-02	MXY	4.636692E-02	VX	-3.684027E-02	VY	5.084536E-02
	NODE	9	MXX	3.310351E+00	MYY	3.097343E-02	MXY	-2.548146E-02	VX	-3.684027E-02	VY	-3.684627E-02
8	NODE	11	MXX	3.181839E+00	MYY	4.440212E-02	MXY	2.155218E-02	VX	-9.833032E-02	VY	-4.262034E-02
	NODE	14	MXX	2.652004E+00	MYY	-6.491029E-02	MXY	3.140273E-02	VX	-9.833032E-02	VY	5.071969E-02
	NODE	15	MXX	2.896524E+00	MYY	2.024752E-02	MXY	7.434028E-02	VX	-4.990324E-03	VY	5.071969E-02
	NODE	12	MXX	2.969168E+00	MYY	-1.995951E-02	MXY	6.448978E-02	VX	-4.990324E-03	VY	-4.262034E-02
10	NODE	14	MXX	3.004264E+00	MYY	4.076648E-02	MXY	2.960401E-02	VX	-9.578788E-02	VY	-4.716057E-02

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	NODE	17	MXX	2.478074E+00	MYY	-5.566621E-02	MXY	2.799213E-02	VX	-9.578788E-02	VY	4.945717E-02
	NODE	18	MXX	2.723177E+00	MYY	2.070123E-02	MXY	7.179254E-02	VX	8.298568E-04	VY	4.945717E-02
	NODE	15	MXX	2.759380E+00	MYY	-2.089489E-02	MXY	7.340443E-02	VX	8.298568E-04	VY	-4.716057E-02
12	NODE	17	MXX	2.829921E+00	MYY	4.984647E-02	MXY	2.943557E-02	VX	-9.702867E-02	VY	-4.915974E-02
	NODE	20	MXX	2.301983E+00	MYY	-5.290192E-02	MXY	2.840015E-02	VX	-9.702867E-02	VY	4.922432E-02
	NODE	21	MXX	2.548052E+00	MYY	2.098560E-02	MXY	7.009757E-02	VX	1.355369E-03	VY	4.922432E-02
	NODE	18	MXX	2.581876E+00	MYY	-2.164775E-02	MXY	7.113296E-02	VX	1.355369E-03	VY	-4.915974E-02
14	NODE	20	MXX	2.653966E+00	MYY	5.262339E-02	MXY	2.895152E-02	VX	-9.761000E-02	VY	-4.939373E-02
	NODE	23	MXX	2.124838E+00	MYY	-5.271393E-02	MXY	2.872211E-02	VX	-9.761000E-02	VY	4.925251E-02
	NODE	24	MXX	2.371293E+00	MYY	2.097094E-02	MXY	6.962377E-02	VX	1.036197E-03	VY	4.925251E-02
	NODE	21	MXX	2.406838E+00	MYY	-2.130896E-02	MXY	6.985319E-02	VX	1.036197E-03	VY	-4.939373E-02
16	NODE	23	MXX	2.476916E+00	MYY	5.284113E-02	MXY	2.881179E-02	VX	-9.765488E-02	VY	-4.935405E-02
	NODE	26	MXX	1.947906E+00	MYY	-5.290389E-02	MXY	2.879500E-02	VX	-9.765488E-02	VY	4.933155E-02
	NODE	27	MXX	2.194518E+00	MYY	2.113605E-02	MXY	6.959784E-02	VX	1.030669E-03	VY	4.933155E-02
	NODE	24	MXX	2.230234E+00	MYY	-2.127844E-02	MXY	6.961453E-02	VX	1.030669E-03	VY	-4.935405E-02
18	NODE	26	MXX	2.299760E+00	MYY	5.262095E-02	MXY	2.874605E-02	VX	-9.754241E-02	VY	-4.921585E-02
	NODE	29	MXX	1.771043E+00	MYY	-5.268747E-02	MXY	2.875953E-02	VX	-9.754241E-02	VY	4.916754E-02
	NODE	30	MXX	2.017167E+00	MYY	2.077562E-02	MXY	6.957495E-02	VX	8.409508E-04	VY	4.916754E-02
	NODE	27	MXX	2.053588E+00	MYY	-2.111155E-02	MXY	6.956154E-02	VX	8.409508E-04	VY	-4.921585E-02
20	NODE	29	MXX	2.123004E+00	MYY	5.280632E-02	MXY	2.878724E-02	VX	-9.767044E-02	VY	-4.934485E-02
	NODE	32	MXX	1.593833E+00	MYY	-5.288017E-02	MXY	2.876933E-02	VX	-9.767044E-02	VY	4.925695E-02
	NODE	33	MXX	1.840246E+00	MYY	2.087510E-02	MXY	6.959456E-02	VX	9.313598E-04	VY	4.925695E-02
	NODE	30	MXX	1.876421E+00	MYY	-2.135319E-02	MXY	6.961250E-02	VX	9.313598E-04	VY	-4.934485E-02
22	NODE	32	MXX	1.945957E+00	MYY	5.264324E-02	MXY	2.874890E-02	VX	-9.763587E-02	VY	-4.924596E-02
	NODE	35	MXX	1.416837E+00	MYY	-5.287039E-02	MXY	2.874890E-02	VX	-9.763587E-02	VY	4.920680E-02
	NODE	36	MXX	1.663054E+00	MYY	2.075720E-02	MXY	6.957489E-02	VX	8.168966E-04	VY	4.920680E-02
	NODE	33	MXX	1.699680E+00	MYY	-2.118051E-02	MXY	6.957489E-02	VX	8.168966E-04	VY	-4.924596E-02
24	NODE	35	MXX	1.768920E+00	MYY	5.266714E-02	MXY	2.877027E-02	VX	-9.764087E-02	VY	-4.931011E-02
	NODE	38	MXX	1.239901E+00	MYY	-5.297905E-02	MXY	2.875240E-02	VX	-9.764087E-02	VY	4.927753E-02
	NODE	39	MXX	1.486319E+00	MYY	2.090740E-02	MXY	6.957680E-02	VX	9.467490E-04	VY	4.927753E-02
	NODE	36	MXX	1.522418E+00	MYY	-2.134669E-02	MXY	6.959468E-02	VX	9.467490E-04	VY	-4.931011E-02
26	NODE	38	MXX	1.591907E+00	MYY	5.261195E-02	MXY	2.874425E-02	VX	-9.762633E-02	VY	-4.926702E-02
	NODE	41	MXX	1.062907E+00	MYY	-5.296147E-02	MXY	2.872637E-02	VX	-9.762633E-02	VY	4.922463E-02
	NODE	42	MXX	1.309131E+00	MYY	2.077645E-02	MXY	6.954968E-02	VX	8.652993E-04	VY	4.922463E-02
	NODE	39	MXX	1.345584E+00	MYY	-2.130216E-02	MXY	6.956762E-02	VX	8.652993E-04	VY	-4.926702E-02
28	NODE	41	MXX	1.414910E+00	MYY	5.261725E-02	MXY	2.872491E-02	VX	-9.762657E-02	VY	-4.927089E-02
	NODE	44	MXX	8.859120E-01	MYY	-5.295765E-02	MXY	2.872491E-02	VX	-9.762657E-02	VY	4.921237E-02
	NODE	45	MXX	1.132113E+00	MYY	2.072161E-02	MXY	6.955308E-02	VX	8.566417E-04	VY	4.921237E-02

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	NODE	42	MXX	1.168620E+00	MYY	-2.135468E-02	MXY	6.955308E-02	VX	8.566417E-04	VY	-4.927089E-02
30	NODE	44	MXX	1.237881E+00	MYY	5.251527E-02	MXY	2.869464E-02	VX	-9.759295E-02	VY	-4.921093E-02
	NODE	47	MXX	7.089342E-01	MYY	-5.289131E-02	MXY	2.871259E-02	VX	-9.759295E-02	VY	4.917521E-02
	NODE	48	MXX	9.550131E-01	MYY	2.066839E-02	MXY	6.957263E-02	VX	7.931404E-04	VY	4.917521E-02
	NODE	45	MXX	9.917849E-01	MYY	-2.125883E-02	MXY	6.955469E-02	VX	7.931404E-04	VY	-4.921093E-02
32	NODE	47	MXX	1.060936E+00	MYY	5.269134E-02	MXY	2.867166E-02	VX	-9.756052E-02	VY	-4.924649E-02
	NODE	50	MXX	5.320378E-01	MYY	-5.255318E-02	MXY	2.868957E-02	VX	-9.756052E-02	VY	4.905924E-02
	NODE	51	MXX	7.776502E-01	MYY	2.051991E-02	MXY	6.961560E-02	VX	7.451586E-04	VY	4.905924E-02
	NODE	48	MXX	8.148800E-01	MYY	-2.135372E-02	MXY	6.959766E-02	VX	7.451586E-04	VY	-4.924649E-02
34	NODE	50	MXX	8.839499E-01	MYY	5.288130E-02	MXY	2.881731E-02	VX	-9.771645E-02	VY	-4.927872E-02
	NODE	53	MXX	3.548165E-01	MYY	-5.314279E-02	MXY	2.836957E-02	VX	-9.771645E-02	VY	4.900185E-02
	NODE	54	MXX	5.995976E-01	MYY	2.058810E-02	MXY	6.918514E-02	VX	5.640984E-04	VY	4.900185E-02
	NODE	51	MXX	6.378579E-01	MYY	-2.133858E-02	MXY	6.963289E-02	VX	5.640984E-04	VY	-4.927872E-02
36	NODE	53	MXX	7.047067E-01	MYY	5.176061E-02	MXY	2.948966E-02	VX	-9.752488E-02	VY	-4.879723E-02
	NODE	56	MXX	1.789768E-01	MYY	-5.642205E-02	MXY	2.648083E-02	VX	-9.752488E-02	VY	4.759191E-02
	NODE	57	MXX	4.154637E-01	MYY	1.643872E-02	MXY	6.515902E-02	VX	-1.135740E-03	VY	4.759191E-02
	NODE	54	MXX	4.603940E-01	MYY	-2.110928E-02	MXY	6.816781E-02	VX	-1.135740E-03	VY	-4.879723E-02
38	NODE	56	MXX	5.351020E-01	MYY	5.032748E-02	MXY	3.541479E-02	VX	-1.073200E-01	VY	-5.110501E-02
	NODE	59	MXX	-9.726096E-03	MYY	-1.024246E-01	MXY	1.931367E-02	VX	-1.073200E-01	VY	5.344440E-02
	NODE	60	MXX	2.187141E-01	MYY	1.652388E-02	MXY	4.612843E-02	VX	-2.770584E-03	VY	5.344440E-02
	NODE	57	MXX	2.779685E-01	MYY	-2.472198E-02	MXY	6.222952E-02	VX	-2.770584E-03	VY	-5.110501E-02
40	NODE	59	MXX	3.380111E-01	MYY	-4.082918E-05	MXY	3.338669E-02	VX	-1.153917E-01	VY	-4.351132E-02
	NODE	62	MXX	-2.169902E-01	MYY	-1.950859E-01	MXY	3.018080E-02	VX	-1.153917E-01	VY	7.791251E-02
	NODE	63	MXX	8.751887E-02	MYY	6.836716E-03	MXY	2.986905E-02	VX	6.032158E-03	VY	7.791251E-02
	NODE	60	MXX	7.869196E-02	MYY	-2.354549E-02	MXY	3.307495E-02	VX	6.032158E-03	VY	-4.351132E-02

101	NODE	1	SXX	0.119857E+03	SYY	0.359571E+02	SXY	0.141069E+02
		4	SXX	0.107765E+03	SYY	-0.434839E+01	SXY	0.146693E+02
		5	SXX	0.109372E+03	SYY	-0.386639E+01	SXY	0.562340E+00
		2	SXX	0.121464E+03	SYY	0.364391E+02	SXY	0.185752E-04
103	NODE	4	SXX	0.102676E+03	SYY	-0.587535E+01	SXY	-0.125846E+01
		7	SXX	0.104236E+03	SYY	-0.673065E+00	SXY	0.142981E+01
		8	SXX	0.111917E+03	SYY	0.163115E+01	SXY	0.325059E+01
		5	SXX	0.110356E+03	SYY	-0.357114E+01	SXY	0.562345E+00
105	NODE	7	SXX	0.101784E+03	SYY	-0.140869E+01	SXY	0.240992E+01
		10	SXX	0.102505E+03	SYY	0.993225E+00	SXY	0.244116E+01
		11	SXX	0.102594E+03	SYY	0.101999E+01	SXY	0.328182E+01
		8	SXX	0.101873E+03	SYY	-0.138193E+01	SXY	0.325060E+01
107	NODE	10	SXX	0.961299E+02	SYY	-0.919235E+00	SXY	0.261785E+01

/-ELEMENT-//----------/

		13	SXX	0.966990E+02	SYY	0.977783E+00	SXY	0.259314E+01
		14	SXX	0.966284E+02	SYY	0.956589E+00	SXY	0.325710E+01
		11	SXX	0.960592E+02	SYY	-0.940430E+00	SXY	0.328182E+01
109	NODE	13	SXX	0.902444E+02	SYY	-0.958603E+00	SXY	0.258482E+01
		16	SXX	0.908206E+02	SYY	0.962234E+00	SXY	0.258485E+01
		17	SXX	0.908204E+02	SYY	0.962173E+00	SXY	0.325716E+01
		14	SXX	0.902442E+02	SYY	-0.958664E+00	SXY	0.325711E+01
111	NODE	16	SXX	0.844022E+02	SYY	-0.963287E+00	SXY	0.258334E+01
		19	SXX	0.849800E+02	SYY	0.962646E+00	SXY	0.258341E+01
		20	SXX	0.849802E+02	SYY	0.962708E+00	SXY	0.325757E+01
		17	SXX	0.844024E+02	SYY	-0.963226E+00	SXY	0.325725E+01
113	NODE	19	SXX	0.785623E+02	SYY	-0.962646E+00	SXY	0.258358E+01
		22	SXX	0.791400E+02	SYY	0.962952E+00	SXY	0.258344E+01
		23	SXX	0.791394E+02	SYY	0.962753E+00	SXY	0.325743E+01
		20	SXX	0.785617E+02	SYY	-0.962845E+00	SXY	0.325764E+01
115	NODE	22	SXX	0.727212E+02	SYY	-0.962692E+00	SXY	0.258361E+01
		25	SXX	0.732988E+02	SYY	0.962830E+00	SXY	0.258344E+01
		26	SXX	0.732985E+02	SYY	0.962738E+00	SXY	0.325743E+01
		23	SXX	0.727209E+02	SYY	-0.962784E+00	SXY	0.325749E+01
117	NODE	25	SXX	0.668804E+02	SYY	-0.962708E+00	SXY	0.258361E+01
		28	SXX	0.674581E+02	SYY	0.962814E+00	SXY	0.258358E+01
		29	SXX	0.674574E+02	SYY	0.962601E+00	SXY	0.325739E+01
		26	SXX	0.668797E+02	SYY	-0.962921E+00	SXY	0.325749E+01
119	NODE	28	SXX	0.610396E+02	SYY	-0.962723E+00	SXY	0.258358E+01
		31	SXX	0.616172E+02	SYY	0.962814E+00	SXY	0.258354E+01
		32	SXX	0.616168E+02	SYY	0.962677E+00	SXY	0.325753E+01
		29	SXX	0.610392E+02	SYY	-0.962860E+00	SXY	0.325744E+01
121	NODE	31	SXX	0.551991E+02	SYY	-0.962631E+00	SXY	0.258354E+01
		34	SXX	0.557768E+02	SYY	0.962891E+00	SXY	0.258344E+01
		35	SXX	0.557762E+02	SYY	0.962723E+00	SXY	0.325743E+01
		32	SXX	0.551985E+02	SYY	-0.962799E+00	SXY	0.325757E+01
123	NODE	34	SXX	0.493581E+02	SYY	-0.962708E+00	SXY	0.258361E+01
		37	SXX	0.499358E+02	SYY	0.962831E+00	SXY	0.258351E+01
		38	SXX	0.499353E+02	SYY	0.962694E+00	SXY	0.325749E+01
		35	SXX	0.493576E+02	SYY	-0.962845E+00	SXY	0.325747E+01
125	NODE	37	SXX	0.435174E+02	SYY	-0.962667E+00	SXY	0.258368E+01
		40	SXX	0.440951E+02	SYY	0.962867E+00	SXY	0.258351E+01
		41	SXX	0.440944E+02	SYY	0.962668E+00	SXY	0.325749E+01

/-ELEMENT-//----------/

		38	SXX	0.435168E+02	SYY	-0.962865E+00	SXY	0.325754E+01
127	NODE	40	SXX	0.376767E+02	SYY	-0.962639E+00	SXY	0.258368E+01
		43	SXX	0.382544E+02	SYY	0.962887E+00	SXY	0.258351E+01
		44	SXX	0.382537E+02	SYY	0.962689E+00	SXY	0.325748E+01
		41	SXX	0.376761E+02	SYY	-0.962836E+00	SXY	0.325754E+01
129	NODE	43	SXX	0.318359E+02	SYY	-0.962672E+00	SXY	0.258351E+01
		46	SXX	0.324135E+02	SYY	0.962835E+00	SXY	0.258348E+01
		47	SXX	0.324130E+02	SYY	0.962691E+00	SXY	0.325745E+01
		44	SXX	0.318354E+02	SYY	-0.962816E+00	SXY	0.325754E+01
131	NODE	46	SXX	0.259949E+02	SYY	-0.962753E+00	SXY	0.258348E+01
		49	SXX	0.265727E+02	SYY	0.963425E+00	SXY	0.258334E+01
		50	SXX	0.265722E+02	SYY	0.963252E+00	SXY	0.325748E+01
		47	SXX	0.259943E+02	SYY	-0.962926E+00	SXY	0.325751E+01
133	NODE	49	SXX	0.201599E+02	SYY	-0.960440E+00	SXY	0.258200E+01
		52	SXX	0.207388E+02	SYY	0.969325E+00	SXY	0.257847E+01
		53	SXX	0.207278E+02	SYY	0.966043E+00	SXY	0.325378E+01
		50	SXX	0.201489E+02	SYY	-0.963721E+00	SXY	0.325755E+01
135	NODE	52	SXX	0.143225E+02	SYY	-0.955576E+00	SXY	0.259896E+01
		55	SXX	0.148839E+02	SYY	0.916010E+00	SXY	0.259768E+01
		56	SXX	0.148801E+02	SYY	0.914859E+00	SXY	0.325267E+01
		53	SXX	0.143186E+02	SYY	-0.956727E+00	SXY	0.325387E+01
137	NODE	55	SXX	0.798642E+01	SYY	-0.115324E+01	SXY	0.274074E+01
		58	SXX	0.842530E+01	SYY	0.309697E+00	SXY	0.306702E+01
		59	SXX	0.935762E+01	SYY	0.589391E+00	SXY	0.357911E+01
		56	SXX	0.891874E+01	SYY	-0.873549E+00	SXY	0.325278E+01
139	NODE	58	SXX	0.126384E+01	SYY	-0.183874E+01	SXY	0.131239E+01
		61	SXX	0.320681E+01	SYY	0.463781E+01	SXY	0.177793E+01
		62	SXX	0.453624E+01	SYY	0.503664E+01	SXY	0.404466E+01
		59	SXX	0.259328E+01	SYY	-0.143991E+01	SXY	0.357924E+01
102	NODE	2	SXX	0.121464E+03	SYY	0.364391E+02	SXY	0.185752E-04
		5	SXX	0.109372E+03	SYY	-0.386642E+01	SXY	-0.562330E+00
		6	SXX	0.107765E+03	SYY	-0.434845E+01	SXY	-0.146693E+02
		3	SXX	0.119857E+03	SYY	0.359571E+02	SXY	-0.141069E+02
104	NODE	5	SXX	0.110356E+03	SYY	-0.357117E+01	SXY	-0.562319E+00
		8	SXX	0.111917E+03	SYY	0.163112E+01	SXY	-0.325058E+01
		9	SXX	0.104236E+03	SYY	-0.673096E+00	SXY	-0.142977E+01
		6	SXX	0.102676E+03	SYY	-0.587538E+01	SXY	0.125847E+01
106	NODE	8	SXX	0.101873E+03	SYY	-0.138196E+01	SXY	-0.325058E+01

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		11	SXX	0.102594E+03	SYY	0.101996E+01	SXY	-0.328181E+01
		12	SXX	0.102505E+03	SYY	0.993179E+00	SXY	-0.244114E+01
		9	SXX	0.101784E+03	SYY	-0.140874E+01	SXY	-0.240990E+01
108	NODE	11	SXX	0.960593E+02	SYY	-0.940445E+00	SXY	-0.328181E+01
		14	SXX	0.966284E+02	SYY	0.956604E+00	SXY	-0.325707E+01
		15	SXX	0.966991E+02	SYY	0.977798E+00	SXY	-0.259309E+01
		12	SXX	0.961299E+02	SYY	-0.919250E+00	SXY	-0.261783E+01
110	NODE	14	SXX	0.902445E+02	SYY	-0.958572E+00	SXY	-0.325706E+01
		17	SXX	0.908207E+02	SYY	0.962265E+00	SXY	-0.325705E+01
		18	SXX	0.908200E+02	SYY	0.962051E+00	SXY	-0.258475E+01
		15	SXX	0.902438E+02	SYY	-0.958786E+00	SXY	-0.258477E+01
112	NODE	17	SXX	0.844032E+02	SYY	-0.962997E+00	SXY	-0.325705E+01
		20	SXX	0.849810E+02	SYY	0.962936E+00	SXY	-0.325725E+01
		21	SXX	0.849796E+02	SYY	0.962509E+00	SXY	-0.258315E+01
		18	SXX	0.844018E+02	SYY	-0.963425E+00	SXY	-0.258292E+01
114	NODE	20	SXX	0.785623E+02	SYY	-0.962677E+00	SXY	-0.325725E+01
		23	SXX	0.791399E+02	SYY	0.962921E+00	SXY	-0.325735E+01
		24	SXX	0.791395E+02	SYY	0.962784E+00	SXY	-0.258338E+01
		21	SXX	0.785618E+02	SYY	-0.962814E+00	SXY	-0.258324E+01
116	NODE	23	SXX	0.727211E+02	SYY	-0.962723E+00	SXY	-0.325719E+01
		26	SXX	0.732988E+02	SYY	0.962799E+00	SXY	-0.325732E+01
		27	SXX	0.732985E+02	SYY	0.962738E+00	SXY	-0.258337E+01
		24	SXX	0.727209E+02	SYY	-0.962784E+00	SXY	-0.258333E+01
118	NODE	26	SXX	0.668803E+02	SYY	-0.962753E+00	SXY	-0.325715E+01
		29	SXX	0.674579E+02	SYY	0.962769E+00	SXY	-0.325719E+01
		30	SXX	0.674578E+02	SYY	0.962723E+00	SXY	-0.258325E+01
		27	SXX	0.668801E+02	SYY	-0.962799E+00	SXY	-0.258326E+01
120	NODE	29	SXX	0.610400E+02	SYY	-0.962616E+00	SXY	-0.325719E+01
		32	SXX	0.616176E+02	SYY	0.962921E+00	SXY	-0.325725E+01
		33	SXX	0.616167E+02	SYY	0.962631E+00	SXY	-0.258331E+01
		30	SXX	0.610390E+02	SYY	-0.962906E+00	SXY	-0.258309E+01
122	NODE	32	SXX	0.551990E+02	SYY	-0.962662E+00	SXY	-0.325725E+01
		35	SXX	0.557767E+02	SYY	0.962860E+00	SXY	-0.325732E+01
		36	SXX	0.557762E+02	SYY	0.962723E+00	SXY	-0.258338E+01
		33	SXX	0.551985E+02	SYY	-0.962799E+00	SXY	-0.258329E+01
124	NODE	35	SXX	0.493580E+02	SYY	-0.962738E+00	SXY	-0.325715E+01
		38	SXX	0.499357E+02	SYY	0.962795E+00	SXY	-0.325725E+01
		39	SXX	0.499352E+02	SYY	0.962658E+00	SXY	-0.258332E+01

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		36	SXX	0.493576E+02	SYY	-0.962875E+00	SXY	-0.258332E+01
126	NODE	38	SXX	0.435173E+02	SYY	-0.962700E+00	SXY	-0.325725E+01
		41	SXX	0.440950E+02	SYY	0.962831E+00	SXY	-0.325725E+01
		42	SXX	0.440943E+02	SYY	0.962634E+00	SXY	-0.258332E+01
		39	SXX	0.435167E+02	SYY	-0.962897E+00	SXY	-0.258321E+01
128	NODE	41	SXX	0.376767E+02	SYY	-0.962673E+00	SXY	-0.325725E+01
		44	SXX	0.382543E+02	SYY	0.962860E+00	SXY	-0.325725E+01
		45	SXX	0.382536E+02	SYY	0.962662E+00	SXY	-0.258332E+01
		42	SXX	0.376760E+02	SYY	-0.962872E+00	SXY	-0.258317E+01
130	NODE	44	SXX	0.318359E+02	SYY	-0.962672E+00	SXY	-0.325725E+01
		47	SXX	0.324135E+02	SYY	0.962831E+00	SXY	-0.325732E+01
		48	SXX	0.324129E+02	SYY	0.962661E+00	SXY	-0.258340E+01
		45	SXX	0.318353E+02	SYY	-0.962843E+00	SXY	-0.258329E+01
132	NODE	47	SXX	0.259948E+02	SYY	-0.962786E+00	SXY	-0.325732E+01
		50	SXX	0.265726E+02	SYY	0.963390E+00	SXY	-0.325722E+01
		51	SXX	0.265722E+02	SYY	0.963246E+00	SXY	-0.258307E+01
		48	SXX	0.259943E+02	SYY	-0.962930E+00	SXY	-0.258314E+01
134	NODE	50	SXX	0.201495E+02	SYY	-0.963554E+00	SXY	-0.325722E+01
		53	SXX	0.207284E+02	SYY	0.966212E+00	SXY	-0.325363E+01
		54	SXX	0.207382E+02	SYY	0.969149E+00	SXY	-0.257822E+01
		51	SXX	0.201593E+02	SYY	-0.960618E+00	SXY	-0.258170E+01
136	NODE	53	SXX	0.143194E+02	SYY	-0.956501E+00	SXY	-0.325363E+01
		56	SXX	0.148808E+02	SYY	0.915085E+00	SXY	-0.325259E+01
		57	SXX	0.148835E+02	SYY	0.915891E+00	SXY	-0.259738E+01
		54	SXX	0.143221E+02	SYY	-0.955695E+00	SXY	-0.259851E+01
138	NODE	56	SXX	0.891931E+01	SYY	-0.873380E+00	SXY	-0.325242E+01
		59	SXX	0.935820E+01	SYY	0.589579E+00	SXY	-0.357896E+01
		60	SXX	0.842473E+01	SYY	0.309540E+00	SXY	-0.306694E+01
		57	SXX	0.798585E+01	SYY	-0.115342E+01	SXY	-0.274040E+01
140	NODE	59	SXX	0.259376E+01	SYY	-0.143975E+01	SXY	-0.357880E+01
		62	SXX	0.453672E+01	SYY	0.503677E+01	SXY	-0.404440E+01
		63	SXX	0.320613E+01	SYY	0.463759E+01	SXY	-0.177762E+01
		60	SXX	0.126318E+01	SYY	-0.183893E+01	SXY	-0.131205E+01

LOADING - 1 POINT LOAD AT END OF BEAM

MEMBER FORCES LOADING - 1

MEMBER	JOINT	FORCE AXIAL	FORCE SHEAR Y	FORCE SHEAR Z	MOMENT TORSIONAL	MOMENT BENDING Y	MOMENT BENDING Z
201	2	1146.14648	0.0001267	100.586487	0.0004283	-3662.64429	0.0008510
201	5	-1146.14648	-0.0001267	-100.586487	-0.0004283	3159.71191	-0.0002175
202	5	1072.96265	0.0000380	99.0636139	0.0008075	-3561.52515	0.0002175
202	8	-1072.96265	-0.0000380	-99.0636139	-0.0008075	3066.20703	-0.0000278
203	8	1021.89111	0.0000100	99.2073059	0.0008733	-3346.03271	0.0000278
203	11	-1021.89111	-0.0000100	-99.2073059	-0.0008733	2849.99609	0.0000223
204	11	963.791260	0.0000033	99.3970032	0.0008510	-3168.38281	-0.0000223
204	14	-963.791260	-0.0000033	-99.3970032	-0.0008510	2671.39771	0.0000387
205	14	905.325195	0.0000020	99.4375000	0.0008013	-2991.88647	-0.0000387
205	17	-905.325195	-0.0000020	-99.4375000	-0.0008013	2494.69873	0.0000485
206	17	846.914307	0.0000017	99.4381256	0.0007377	-2814.90649	-0.0000485
206	20	-846.914307	-0.0000017	-99.4381256	-0.0007377	2317.71582	0.0000569
207	20	788.506592	0.0000015	99.4360046	0.0006627	-2637.90796	-0.0000569
207	23	-788.506592	-0.0000015	-99.4360046	-0.0006627	2140.72803	0.0000647
208	23	730.098633	0.0000014	99.4353790	0.0005776	-2460.91992	-0.0000647
208	26	-730.098633	-0.0000014	-99.4353790	-0.0005776	1963.74316	0.0000718
209	26	671.690918	0.0000013	99.4353485	0.0004830	-2283.93384	-0.0000718
209	29	-671.690918	-0.0000013	-99.4353485	-0.0004830	1786.75708	0.0000783
210	29	613.282959	0.0000012	99.4354248	0.0003799	-2106.94800	-0.0000783
210	32	-613.282959	-0.0000012	-99.4354248	-0.0003799	1609.77075	0.0000842
211	32	554.875244	0.0000011	99.4355011	0.0002689	-1929.96191	-0.0000842
211	35	-554.875244	-0.0000011	-99.4355011	-0.0002689	1432.78418	0.0000896
212	35	496.467285	0.0000010	99.4355621	0.0001509	-1752.97559	-0.0000896
212	38	-496.467285	-0.0000010	-99.4355621	-0.0001509	1255.79761	0.0000944
213	38	438.059570	0.0000008	99.4356079	0.0000265	-1575.98926	-0.0000944
213	41	-438.059570	-0.0000008	-99.4356079	-0.0000265	1078.81104	0.0000986
214	41	379.651611	0.0000008	99.4356842	-0.0001034	-1399.00293	-0.0000986
214	44	-379.651611	-0.0000008	-99.4356842	0.0001034	901.824463	0.0001024
215	44	321.243652	0.0000007	99.4358063	-0.0002384	-1222.01685	-0.0001024
215	47	-321.243652	-0.0000007	-99.4358063	0.0002384	724.837891	0.0001060
216	47	262.835937	0.0000001	99.4356995	-0.0003775	-1045.02783	-0.0001060
216	50	-262.835937	-0.0000001	-99.4356995	0.0003775	547.849365	0.0001064
217	50	204.438065	-0.0000045	99.4340668	-0.0005131	-867.986328	-0.0001064
217	53	-204.438065	0.0000045	-99.4340668	0.0005131	370.815918	0.0000839
218	53	146.014725	-0.0000187	99.4267731	-0.0006089	-691.087891	-0.0000839
218	56	-146.014725	0.0000187	-99.4267731	0.0006089	193.954132	-0.0000095
219	56	86.7197266	-0.0000285	99.3993530	-0.0005871	-518.984863	0.0000095
219	59	-86.7197266	0.0000285	-99.3993530	0.0005871	21.9880981	-0.0001520

MEMBER FORCES LOADING - 1

MEMBER	JOINT	FORCE AXIAL	FORCE SHEAR Y	FORCE SHEAR Z	MOMENT TORSIONAL	MOMENT BENDING Y	MOMENT BENDING Z
220	59	29.0006256	0.0000304	99.4597168	-0.0004458	-338.427979	0.0001520
220	62	-29.0006256	-0.0000304	-99.4597168	0.0004458	-158.870483	-0.0000000

SUPPORT JOINT REACTION LOADS LOADING - 1

JOINT		FORCE X FORCE	FORCE Y FORCE	FORCE Z FORCE	MOMENT X MOMENT	MOMENT Y MOMENT	MOMENT Z MOMENT
1	GLOBAL	-304.203857	-75.2440338	-1.0303469	1.8399944	-7.5440054	
2	GLOBAL	608.407471	0.0000907	102.059692	0.0011436	-9984.89062	0.0008510
3	GLOBAL	-304.203613	75.2439423	-1.0301609	-1.8400841	-7.5444221	

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
1	GLOBAL	0.0	0.0	0.0	0.0	0.0	
2	GLOBAL	0.0	0.0	0.0	0.0	0.0	0.0
3	GLOBAL	0.0	0.0	0.0	0.0	0.0	

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
4	GLOBAL	0.0000182	0.0000061	-0.0000147	-0.0000014	0.0000064	
7	GLOBAL	0.0000356	0.0000053	-0.0000642	-0.0000018	0.0000134	
10	GLOBAL	0.0000526	0.0000050	-0.0001472	-0.0000018	0.0000198	
13	GLOBAL	0.0000687	0.0000047	-0.0002607	-0.0000017	0.0000256	
16	GLOBAL	0.0000838	0.0000044	-0.0004025	-0.0000016	0.0000311	
19	GLOBAL	0.0000979	0.0000041	-0.0005709	-0.0000015	0.0000362	
22	GLOBAL	0.0001110	0.0000038	-0.0007641	-0.0000014	0.0000410	
25	GLOBAL	0.0001232	0.0000035	-0.0009803	-0.0000013	0.0000454	
28	GLOBAL	0.0001344	0.0000032	-0.0012177	-0.0000012	0.0000495	
31	GLOBAL	0.0001446	0.0000029	-0.0014746	-0.0000011	0.0000532	
34	GLOBAL	0.0001539	0.0000026	-0.0017491	-0.0000010	0.0000566	
37	GLOBAL	0.0001621	0.0000023	-0.0020396	-0.0000009	0.0000596	

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
40	GLOBAL	0.0001694	0.0000020	-0.0023443	-0.0000007	0.0000623	
43	GLOBAL	0.0001758	0.0000018	-0.0026614	-0.0000006	0.0000646	
46	GLOBAL	0.0001811	0.0000015	-0.0029890	-0.0000005	0.0000665	
49	GLOBAL	0.0001855	0.0000012	-0.0033256	-0.0000004	0.0000681	
52	GLOBAL	0.0001889	0.0000009	-0.0036692	-0.0000003	0.0000693	
55	GLOBAL	0.0001913	0.0000006	-0.0040181	-0.0000002	0.0000702	
58	GLOBAL	0.0001927	0.0000004	-0.0043704	-0.0000001	0.0000707	
61	GLOBAL	0.0001930	-0.0000006	-0.0047244	-0.0000001	0.0000709	
5	GLOBAL	0.0000184	0.0000000	-0.0000175	-0.0000000	0.0000068	-0.0000000
8	GLOBAL	0.0000370	0.0000000	-0.0000686	-0.0000000	0.0000135	-0.0000000
11	GLOBAL	0.0000540	0.0000000	-0.0001517	-0.0000000	0.0000196	-0.0000000
14	GLOBAL	0.0000701	0.0000000	-0.0002650	-0.0000000	0.0000255	-0.0000000
17	GLOBAL	0.0000852	0.0000000	-0.0004065	-0.0000000	0.0000310	-0.0000000
20	GLOBAL	0.0000993	0.0000000	-0.0005747	-0.0000000	0.0000361	-0.0000000
23	GLOBAL	0.0001124	0.0000000	-0.0007676	-0.0000000	0.0000409	-0.0000000
26	GLOBAL	0.0001246	0.0000000	-0.0009835	-0.0000000	0.0000453	-0.0000000
29	GLOBAL	0.0001358	0.0000000	-0.0012206	-0.0000000	0.0000494	-0.0000000
32	GLOBAL	0.0001460	0.0000000	-0.0014772	-0.0000000	0.0000531	-0.0000000
35	GLOBAL	0.0001553	0.0000000	-0.0017515	-0.0000000	0.0000565	-0.0000000
38	GLOBAL	0.0001636	0.0000000	-0.0020418	-0.0000000	0.0000595	-0.0000000
41	GLOBAL	0.0001709	0.0000000	-0.0023462	-0.0000000	0.0000621	0.0000000
44	GLOBAL	0.0001772	0.0000000	-0.0026630	-0.0000000	0.0000644	0.0000000
47	GLOBAL	0.0001825	0.0000000	-0.0029904	-0.0000000	0.0000664	0.0000000
50	GLOBAL	0.0001869	0.0000000	-0.0033266	-0.0000000	0.0000680	0.0000000
53	GLOBAL	0.0001903	0.0000000	-0.0036700	-0.0000000	0.0000692	0.0000000
56	GLOBAL	0.0001928	0.0000000	-0.0040186	-0.0000000	0.0000701	0.0000000
59	GLOBAL	0.0001943	0.0000000	-0.0043708	-0.0000000	0.0000706	0.0000000
62	GLOBAL	0.0001948	0.0000000	-0.0047248	-0.0000000	0.0000708	0.0000000
6	GLOBAL	0.0000182	-0.0000061	-0.0000147	0.0000014	0.0000064	
9	GLOBAL	0.0000356	-0.0000053	-0.0000642	0.0000018	0.0000134	
12	GLOBAL	0.0000526	-0.0000050	-0.0001472	0.0000018	0.0000198	
15	GLOBAL	0.0000687	-0.0000047	-0.0002607	0.0000017	0.0000256	
18	GLOBAL	0.0000838	-0.0000044	-0.0004026	0.0000016	0.0000311	
21	GLOBAL	0.0000979	-0.0000041	-0.0005709	0.0000015	0.0000362	
24	GLOBAL	0.0001110	-0.0000038	-0.0007641	0.0000014	0.0000410	
27	GLOBAL	0.0001232	-0.0000035	-0.0009803	0.0000013	0.0000454	
30	GLOBAL	0.0001344	-0.0000032	-0.0012177	0.0000012	0.0000495	
33	GLOBAL	0.0001446	-0.0000029	-0.0014746	0.0000011	0.0000532	
36	GLOBAL	0.0001539	-0.0000026	-0.0017491	0.0000010	0.0000566	
39	GLOBAL	0.0001621	-0.0000023	-0.0020396	0.0000008	0.0000596	
42	GLOBAL	0.0001694	-0.0000020	-0.0023443	0.0000007	0.0000623	
45	GLOBAL	0.0001758	-0.0000018	-0.0026614	0.0000006	0.0000646	
48	GLOBAL	0.0001811	-0.0000015	-0.0029890	0.0000005	0.0000665	
51	GLOBAL	0.0001855	-0.0000012	-0.0033256	0.0000004	0.0000681	

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
54	GLOBAL	0.0001889	-0.0000009	-0.0036692	0.0000003	0.0000693	
57	GLOBAL	0.0001913	-0.0000006	-0.0040181	0.0000002	0.0000702	
60	GLOBAL	0.0001927	-0.0000004	-0.0043704	0.0000001	0.0000707	
63	GLOBAL	0.0001930	0.0000006	-0.0047244	0.0000001	0.0000709	

PAGE - 30

EXECUTE PROGRAM 'QQSTJTAV'

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***************************
*RESULTS OF LATEST ANALYSIS*
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PROBLEM - BEAM TITLE - T BEAM WITH ECCENTRICITY

ACTIVE UNITS INCH LB RAD FAHR SEC LBM

A V E R A G E N O D A L S T R E S S

//---NODE---//	//---LOAD---//	//------MXX------//	//------MYY------//	//------MXY------//	//------VX------//	//------VY------//
1	1	0.268060E+01	0.804181E+00	0.339722E+00	0.594456E-01	0.268888E+00
4	1	0.375100E+01	-0.761766E-01	0.358697E+00	0.285423E-01	0.119009E+00
7	1	0.335719E+01	0.450273E-01	0.349506E-01	-0.195983E-01	-0.327465E-02
10	1	0.302787E+01	-0.234878E-02	-0.553402E-01	-0.209035E-01	-0.411277E-02
13	1	0.282792E+01	-0.321805E-03	-0.737959E-01	-0.203303E-02	-0.177914E-02
16	1	0.265260E+01	-0.380844E-03	-0.713945E-01	0.114924E-02	-0.188716E-03
19	1	0.247734E+01	-0.163436E-03	-0.699313E-01	0.131063E-02	0.950675E-04
22	1	0.230098E+01	0.974536E-04	-0.695824E-01	0.113841E-02	-0.707805E-04
25	1	0.212400E+01	0.673831E-04	-0.695490E-01	0.101315E-02	-0.720248E-04
28	1	0.194685E+01	-0.122249E-03	-0.695816E-01	0.102664E-02	0.126176E-04
31	1	0.176996E+01	-0.562966E-04	-0.696109E-01	0.105574E-02	-0.415221E-04
34	1	0.159296E+01	-0.700951E-04	-0.696024E-01	0.101057E-02	-0.565741E-04
37	1	0.141582E+01	-0.243276E-03	-0.696059E-01	0.103274E-02	0.138525E-04
40	1	0.123896E+01	-0.166714E-03	-0.696133E-01	0.105955E-02	-0.348054E-04
43	1	0.106196E+01	-0.168651E-03	-0.696297E-01	0.103122E-02	-0.471380E-04
46	1	0.884912E+00	-0.254929E-03	-0.697013E-01	0.104939E-02	-0.344403E-05
49	1	0.708056E+00	-0.169843E-03	-0.697438E-01	0.905093E-03	-0.107232E-04

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
52	1	0.529873E+00	-0.319570E-03	-0.688168E-01	-0.289809E-04	-0.754446E-04
55	1	0.346665E+00	-0.402507E-02	-0.638988E-01	-0.149554E-02	0.174991E-02
58	1	0.147667E+00	-0.409315E-02	-0.400029E-01	0.272649E-02	-0.464986E-02
61	1	0.902961E-01	0.870705E-02	-0.301918E-01	0.765122E-02	-0.788769E-01
2	1	0.402504E+01	0.120751E+01	-0.208616E-05	-0.164795E+00	0.212491E-04
5	1	0.361174E+01	0.836658E+00	0.365684E-04	-0.201963E+00	-0.227988E-05
8	1	0.324657E+01	0.134376E+00	0.452697E-04	-0.181833E+00	-0.195764E-05
11	1	0.300689E+01	-0.808768E-02	0.443682E-04	-0.111436E+00	-0.130385E-06
14	1	0.282813E+01	-0.120849E-01	0.380185E-04	-0.970708E-01	0.212342E-06
17	1	0.265399E+01	-0.295407E-02	0.336869E-04	-0.964269E-01	-0.199992E-04
20	1	0.247798E+01	-0.160784E-03	0.215685E-04	-0.973575E-01	0.518095E-05
23	1	0.230083E+01	-0.538230E-04	0.178730E-04	-0.976670E-01	-0.607735E-04
26	1	0.212383E+01	-0.186861E-03	0.149747E-04	-0.976304E-01	-0.708830E-05
29	1	0.194698E+01	-0.393093E-04	0.578910E-05	-0.976486E-01	-0.380194E-04
32	1	0.176989E+01	-0.182092E-03	-0.134157E-04	-0.976983E-01	-0.180146E-04
35	1	0.159285E+01	-0.202402E-03	-0.905246E-05	-0.976821E-01	-0.541136E-04
38	1	0.141589E+01	-0.199124E-03	-0.171131E-04	-0.976730E-01	0.955258E-05
41	1	0.123889E+01	-0.241011E-03	-0.311667E-04	-0.976721E-01	-0.289679E-04
44	1	0.106187E+01	-0.292242E-03	-0.381377E-04	-0.976520E-01	-0.232076E-04
47	1	0.884908E+00	-0.172928E-03	-0.584545E-04	-0.976191E-01	-0.195410E-04
50	1	0.707944E+00	0.427663E-04	-0.605192E-04	-0.976608E-01	-0.602324E-04
53	1	0.529765E+00	-0.698522E-03	-0.686981E-04	-0.976399E-01	0.134325E-04

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
56	1	0.357106E+00	-0.310315E-02	-0.884719E-04	-0.102522E+00	-0.332296E-05
59	1	0.164167E+00	-0.510376E-01	-0.184115E-03	-0.111597E+00	0.158343E-03
62	1	-0.217273E+00	-0.195613E+00	-0.152128E-03	-0.115712E+00	-0.482172E-03
3	1	0.268082E+01	0.804245E+00	-0.339724E+00	0.593985E-01	-0.268845E+00
6	1	0.375101E+01	-0.761943E-01	-0.358621E+00	0.285159E-01	-0.119014E+00
9	1	0.335719E+01	0.450239E-01	-0.348587E-01	-0.196035E-01	0.327074E-02
12	1	0.302788E+01	-0.234607E-02	0.554283E-01	-0.209153E-01	0.411251E-02
15	1	0.282795E+01	-0.323683E-03	0.738723E-01	-0.208023E-02	0.177956E-02
18	1	0.265253E+01	-0.473261E-03	0.714628E-01	0.109261E-02	0.148717E-03
21	1	0.247744E+01	-0.161678E-03	0.699754E-01	0.119578E-02	-0.847057E-04
24	1	0.230076E+01	-0.153750E-03	0.696191E-01	0.103343E-02	-0.507664E-04
27	1	0.212405E+01	0.122488E-04	0.695797E-01	0.935810E-03	0.578482E-04
30	1	0.194679E+01	-0.288785E-03	0.695937E-01	0.886155E-03	-0.886563E-04
33	1	0.176996E+01	-0.152707E-03	0.695847E-01	0.874128E-03	0.549294E-05
36	1	0.159274E+01	-0.294745E-03	0.695848E-01	0.881823E-03	-0.516530E-04
39	1	0.141595E+01	-0.197381E-03	0.695722E-01	0.906024E-03	0.525266E-05
42	1	0.123888E+01	-0.289112E-03	0.695513E-01	0.860970E-03	-0.231303E-04
45	1	0.106195E+01	-0.268608E-03	0.695539E-01	0.824891E-03	0.722706E-06
48	1	0.884946E+00	-0.342667E-03	0.695851E-01	0.769150E-03	-0.356380E-04
51	1	0.707854E+00	-0.409335E-03	0.696242E-01	0.654629E-03	-0.109741E-03
54	1	0.529995E+00	-0.260592E-03	0.686765E-01	-0.285821E-03	0.102310E-03

A V E R A G E N O D A L S T R E S S

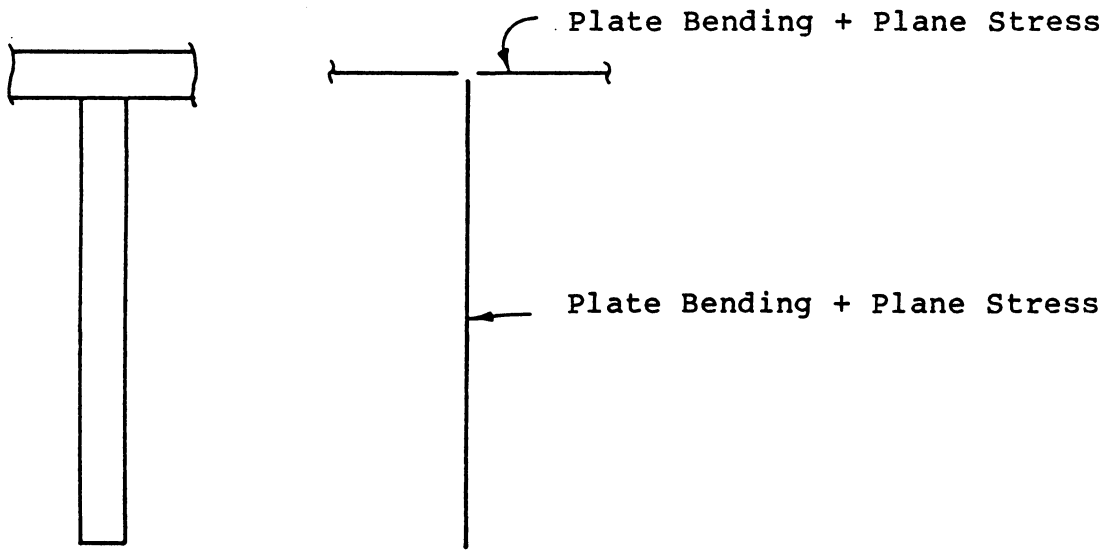
//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
57	1	0.346716E+00	-0.414163E-02	0.636942E-01	-0.195316E-02	-0.175655E-02
60	1	0.148703E+00	-0.351081E-02	0.396017E-01	0.163079E-02	0.496654E-02
63	1	0.875189E-01	0.683672E-02	0.298690E-01	0.603216E-02	0.779125E-01

FINISH

8.11.3 Example #3:

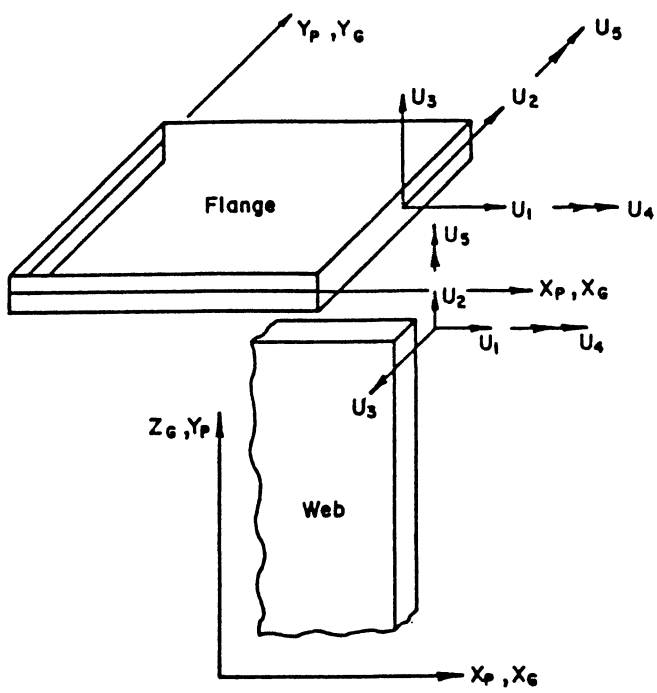
The same T beam, can also be modeled as a folded plate.

Therefore, instead of using a frame member with member eccentricity to model the web we could have used a plate element.



Here, we use BPR

+ IPLQCSH elements



Let's look @ the different degrees of freedom

	Displ.			Rot.		
	X_G	Y_G	Z_G	X_G	Y_G	Z_G
Flange	U_1	U_2	U_3	U_4	U_5	-
Web	U_1	U_3	U_2	U_4	-	U_5

Notice that the rotation U_5 of the flange is not transferred to web and vice versa.

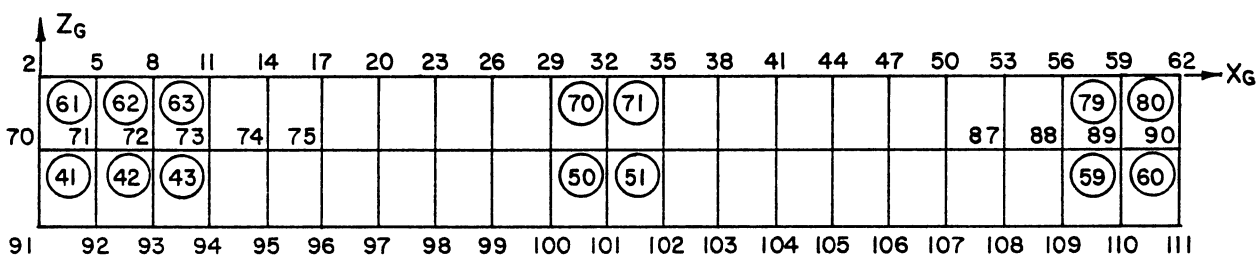
Slow convergence for this problem might be expected since the plane stress elements for the web undergo bending deformation. However, with the use of 'IPLQCSH,' the flexure behavior can be taken into account.

The following mesh layout is considered.

Numbering of the nodes

The flange (top plate) remains as example #2.

While for the web



Results:

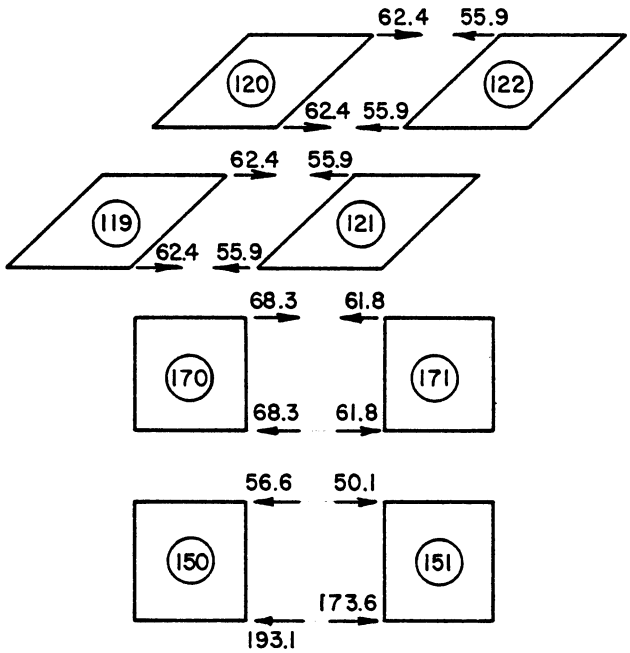
Plate Bending: From 'QQSTJTAV'

Joint	M_{xx}
31	1.97
32	1.31
33	1.97

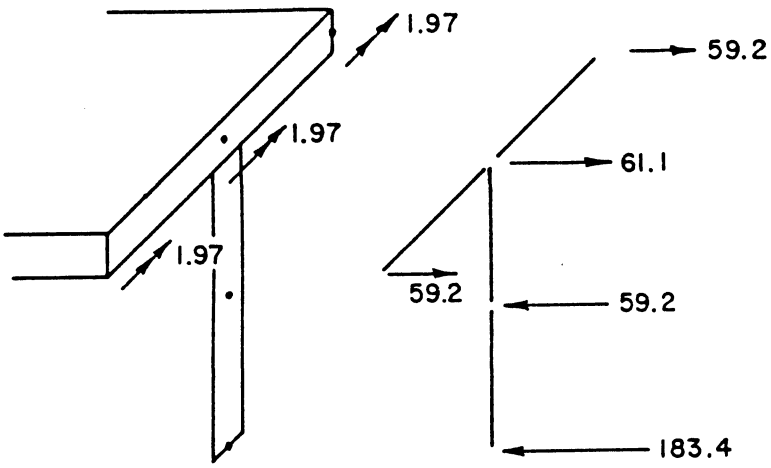
Bending Stress

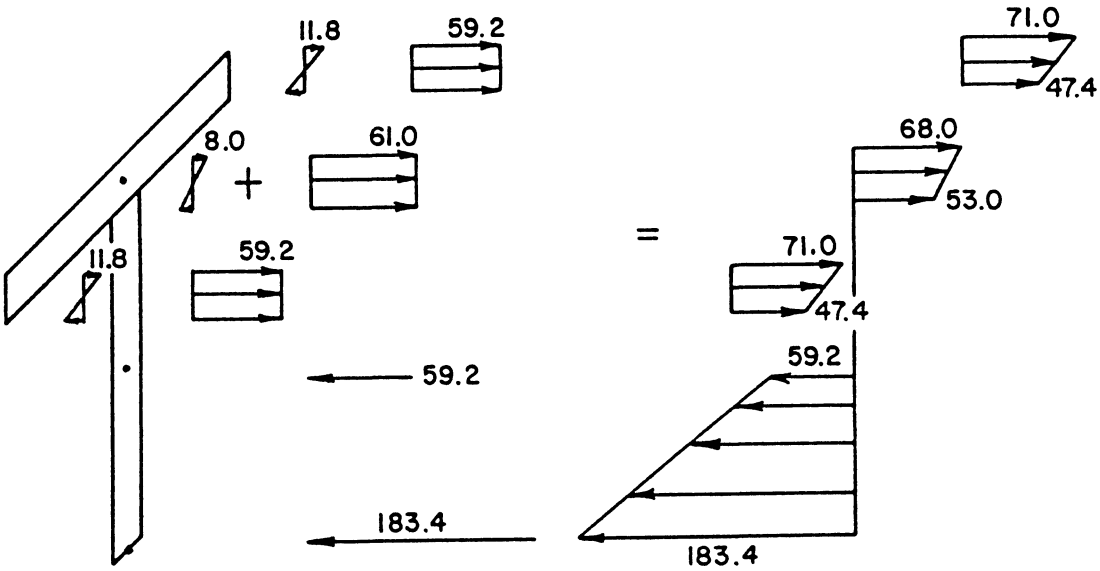
Joint	x_{max}
31	11.82
32	7.9
33	11.82

Plane Stress

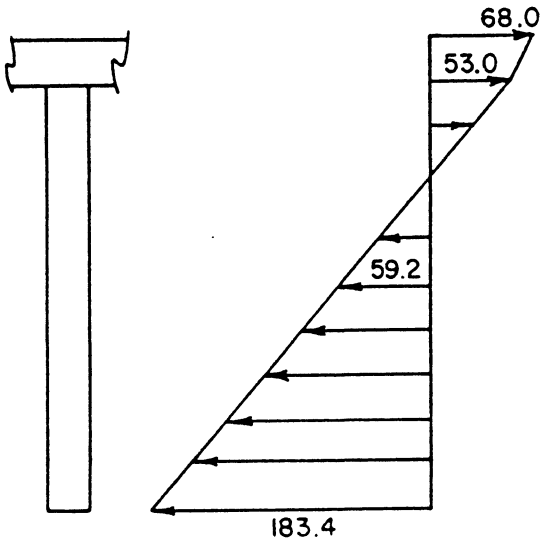


Joint	x
31	59.2
32	61.1
33	59.2
80	-59.2
101	-183.4


1.97
1.97
1.97
59.2
61.1
59.2
59.2
183.4


11.8
59.2
8.0
61.0
+
11.8
59.2
59.2
183.4
=
71.0
47.4
68.0
53.0
71.0
47.4
59.2
183.4

or


68.0
53.0
59.2
183.4

```
STRUDL 'BEAM'   'T BEAM WITH SHELL ELEMENTS'
*****************************************************************
*                                                               *
*   MCAUTO STRUDL                          RELEASE 4.5  APR 1981  *
*   MCAUTO STRUDL DYNAL                    RELEASE 6.5            *
*   MCAUTO STRUDL PLOTS                    RELEASE 3.5            *
*                                                               *
*                                                               *
*                    TIME 13.57.03,  2/05/82                    *
*                                                               *
*                  DATA POOL SIZE   30640 BYTES                 *
*                                                               *
*****************************************************************


$                                          BDEROCBS11

$ RUN OF A CANTELEVER T BEAM UNDER A CONCENTRATED LOAD.

$ THIS EXAMPLE WILL ILLUSTRATE A RUN WHICH USES THE FOLLOWING

$ ELEMENTS:

$          - PLATE BENDING 'BPR'

$          - PLANE STRESS 'IPLQCSH'

$ THIS EXAMPLE SIMULATED THE BEAM AS A FOLDED PLATE

$ TOP PLATE OF THE T

MESH COORDINATES

  1  TO  61  BY  3  X  0.  INCR  5.   Y -5.  Z  0.

  2  TO  62  BY  3  X  0.  INCR  5.   Y  0.  Z  0.

  3  TO  63  BY  3  X  0.  INCR  5.   Y  5.  Z  0.

$ WEB OF THE T

  70 TO  90         X  0.  INCR  5.   Y  0.  Z -5.

  91 TO 111         X  0.  INCR  5    Y  0.  Z -10.

$ PLATE BENDING

TYPE PLATE BENDING
```

```
MESH INCIDENCES

1 TO 39 BY 2 / 1 TO 58 BY 3 / 4 TO 61 BY 3 / 5 TO 62 BY 3 / 2 TO 59 BY 3

2 TO 40 BY 2 / 2 TO 59 BY 3 / 5 TO 62 BY 3 / 6 TO 63 BY 3 / 3 TO 60 BY 3

41 TO 60     / 91 TO 110    / 92 TO 111    / 71 TO 90     / 70 TO 89

61 TO 80     / 70 TO  89    / 71 TO  90    / 5 TO 62 BY 3 / 2 TO 59 BY 3

TYPE PLANE STRESS

MESH INCIDENCES

 101 TO 139 BY 2 /  1 TO 58 BY 3 / 4 TO 61 BY 3 / 5 TO 62 BY 3 /  -
   2 TO  59 BY 3

 102 TO 140 BY 2 /  2 TO 59 BY 3 / 5 TO 62 BY 3 / 6 TO 63 BY 3 /  -
   3 TO  60 BY 3

 141 TO 160   / 91 TO 110  / 92 TO 111  / 71 TO 90  / 70 TO 89

 161 TO 180   / 70 TO  89  / 71 TO  90 / 5 TO 62 BY 3 / 2 TO 59 BY 3

ELEMENT PROPERTIES

  1 TO  80 TYPE 'BPR'     THICKNESS 1.

101 TO 180 TYPE 'IPLQCSH' THICKNESS 1.

CONSTANTS

E  30000000.   ALL

POISSON  0.3   ALL

G 11540000.    ALL

SUPPORT JOINTS  1  2  3  70  91

LOADING 1 'POINT LOAD AT END OF BEAM'

  JOINT 62 LOAD FORCE Z -100.

PRINT STRUCTURE DATA
```

```
****************************************
*  PROBLEM DATA FROM INTERNAL STORAGE  *
****************************************

JOB ID -  BEAM         JOB TITLE - T BEAM WITH SHELL ELEMENTS

ACTIVE UNITS -  LENGTH        FORCE        ANGLE       TEMPERATURE      TIME         MASS
                  INCH         LB           RAD           FAHR           SEC          LBM


         ********** STRUCTURAL DATA **********


JOINT COORDINATE REFERENCE SYSTEMS ------------------------------------------/
ID.    ORIGIN  X          Y          Z   ROTAT. R1          R2          R3


JOINT COORDINATES-----------------------------------------/  STATUS---/
JOINT            X           Y           Z     CONDITION
```

JOINT	X	Y	Z	CONDITION	STATUS	
1	0.0	-5.000	0.0	SUPPORT	ACTIVE	GLOBAL
4	5.000	-5.000	0.0		ACTIVE	GLOBAL
7	10.000	-5.000	0.0		ACTIVE	GLOBAL
10	15.000	-5.000	0.0		ACTIVE	GLOBAL
13	20.000	-5.000	0.0		ACTIVE	GLOBAL
16	25.000	-5.000	0.0		ACTIVE	GLOBAL
19	30.000	-5.000	0.0		ACTIVE	GLOBAL
22	35.000	-5.000	0.0		ACTIVE	GLOBAL
25	40.000	-5.000	0.0		ACTIVE	GLOBAL
28	45.000	-5.000	0.0		ACTIVE	GLOBAL
31	50.000	-5.000	0.0		ACTIVE	GLOBAL
34	55.000	-5.000	0.0		ACTIVE	GLOBAL
37	60.000	-5.000	0.0		ACTIVE	GLOBAL
40	65.000	-5.000	0.0		ACTIVE	GLOBAL
43	70.000	-5.000	0.0		ACTIVE	GLOBAL
46	75.000	-5.000	0.0		ACTIVE	GLOBAL
49	80.000	-5.000	0.0		ACTIVE	GLOBAL
52	85.000	-5.000	0.0		ACTIVE	GLOBAL
55	90.000	-5.000	0.0		ACTIVE	GLOBAL
58	95.000	-5.000	0.0		ACTIVE	GLOBAL
61	100.000	-5.000	0.0		ACTIVE	GLOBAL
2	0.0	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
5	5.000	0.0	0.0		ACTIVE	GLOBAL
8	10.000	0.0	0.0		ACTIVE	GLOBAL
11	15.000	0.0	0.0		ACTIVE	GLOBAL
14	20.000	0.0	0.0		ACTIVE	GLOBAL

17	25.000	0.0	0.0		ACTIVE	GLOBAL
20	30.000	0.0	0.0		ACTIVE	GLOBAL
23	35.000	0.0	0.0		ACTIVE	GLOBAL
26	40.000	0.0	0.0		ACTIVE	GLOBAL
29	45.000	0.0	0.0		ACTIVE	GLOBAL
32	50.000	0.0	0.0		ACTIVE	GLOBAL
35	55.000	0.0	0.0		ACTIVE	GLOBAL
38	60.000	0.0	0.0		ACTIVE	GLOBAL
41	65.000	0.0	0.0		ACTIVE	GLOBAL
44	70.000	0.0	0.0		ACTIVE	GLOBAL
47	75.000	0.0	0.0		ACTIVE	GLOBAL
50	80.000	0.0	0.0		ACTIVE	GLOBAL
53	85.000	0.0	0.0		ACTIVE	GLOBAL
56	90.000	0.0	0.0		ACTIVE	GLOBAL
59	95.000	0.0	0.0		ACTIVE	GLOBAL
62	100.000	0.0	0.0		ACTIVE	GLOBAL
3	0.0	5.000	0.0	SUPPORT	ACTIVE	GLOBAL
6	5.000	5.000	0.0		ACTIVE	GLOBAL
9	10.000	5.000	0.0		ACTIVE	GLOBAL
12	15.000	5.000	0.0		ACTIVE	GLOBAL
15	20.000	5.000	0.0		ACTIVE	GLOBAL
18	25.000	5.000	0.0		ACTIVE	GLOBAL
21	30.000	5.000	0.0		ACTIVE	GLOBAL
24	35.000	5.000	0.0		ACTIVE	GLOBAL
27	40.000	5.000	0.0		ACTIVE	GLOBAL
30	45.000	5.000	0.0		ACTIVE	GLOBAL
33	50.000	5.000	0.0		ACTIVE	GLOBAL
36	55.000	5.000	0.0		ACTIVE	GLOBAL
39	60.000	5.000	0.0		ACTIVE	GLOBAL
42	65.000	5.000	0.0		ACTIVE	GLOBAL
45	70.000	5.000	0.0		ACTIVE	GLOBAL
48	75.000	5.000	0.0		ACTIVE	GLOBAL
51	80.000	5.000	0.0		ACTIVE	GLOBAL
54	85.000	5.000	0.0		ACTIVE	GLOBAL
57	90.000	5.000	0.0		ACTIVE	GLOBAL
60	95.000	5.000	0.0		ACTIVE	GLOBAL
63	100.000	5.000	0.0		ACTIVE	GLOBAL
70	0.0	0.0	-5.000	SUPPORT	ACTIVE	GLOBAL
71	5.000	0.0	-5.000		ACTIVE	GLOBAL
72	10.000	0.0	-5.000		ACTIVE	GLOBAL
73	15.000	0.0	-5.000		ACTIVE	GLOBAL
74	20.000	0.0	-5.000		ACTIVE	GLOBAL
75	25.000	0.0	-5.000		ACTIVE	GLOBAL
76	30.000	0.0	-5.000		ACTIVE	GLOBAL
77	35.000	0.0	-5.000		ACTIVE	GLOBAL
78	40.000	0.0	-5.000		ACTIVE	GLOBAL
79	45.000	0.0	-5.000		ACTIVE	GLOBAL
80	50.000	0.0	-5.000		ACTIVE	GLOBAL
81	55.000	0.0	-5.000		ACTIVE	GLOBAL

82	60.000	0.0	-5.000		ACTIVE	GLOBAL
83	65.000	0.0	-5.000		ACTIVE	GLOBAL
84	70.000	0.0	-5.000		ACTIVE	GLOBAL
85	75.000	0.0	-5.000		ACTIVE	GLOBAL
86	80.000	0.0	-5.000		ACTIVE	GLOBAL
87	85.000	0.0	-5.000		ACTIVE	GLOBAL
88	90.000	0.0	-5.000		ACTIVE	GLOBAL
89	95.000	0.0	-5.000		ACTIVE	GLOBAL
90	100.000	0.0	-5.000		ACTIVE	GLOBAL
91	0.0	0.0	-10.000	SUPPORT	ACTIVE	GLOBAL
92	5.000	0.0	-10.000		ACTIVE	GLOBAL
93	10.000	0.0	-10.000		ACTIVE	GLOBAL
94	15.000	0.0	-10.000		ACTIVE	GLOBAL
95	20.000	0.0	-10.000		ACTIVE	GLOBAL
96	25.000	0.0	-10.000		ACTIVE	GLOBAL
97	30.000	0.0	-10.000		ACTIVE	GLOBAL
98	35.000	0.0	-10.000		ACTIVE	GLOBAL
99	40.000	0.0	-10.000		ACTIVE	GLOBAL
100	45.000	0.0	-10.000		ACTIVE	GLOBAL
101	50.000	0.0	-10.000		ACTIVE	GLOBAL
102	55.000	0.0	-10.000		ACTIVE	GLOBAL
103	60.000	0.0	-10.000		ACTIVE	GLOBAL
104	65.000	0.0	-10.000		ACTIVE	GLOBAL
105	70.000	0.0	-10.000		ACTIVE	GLOBAL
106	75.000	0.0	-10.000		ACTIVE	GLOBAL
107	80.000	0.0	-10.000		ACTIVE	GLOBAL
108	85.000	0.0	-10.000		ACTIVE	GLOBAL
109	90.000	0.0	-10.000		ACTIVE	GLOBAL
110	95.000	0.0	-10.000		ACTIVE	GLOBAL
111	100.000	0.0	-10.000		ACTIVE	GLOBAL

JOINT RELEASES----------/ELASTIC SUPPORT RELEASES----------/

JOINT	FORCE	MOMENT	THETA 1	THETA 2	THETA 3	KFX	KFY	KFZ	KMX	KMY	KMZ

ELEMENT INCIDENCES----------/--STATUS--/-----/----TYPE----/

ELEMENT	NODES					
1	1	4	5	2	ACTIVE	BPR
3	4	7	8	5	ACTIVE	BPR
5	7	10	11	8	ACTIVE	BPR
7	10	13	14	11	ACTIVE	BPR
9	13	16	17	14	ACTIVE	BPR
11	16	19	20	17	ACTIVE	BPR
13	19	22	23	20	ACTIVE	BPR
15						

	22	25	26	23	ACTIVE	BPR
17	25	28	29	26	ACTIVE	BPR
19	28	31	32	29	ACTIVE	BPR
21	31	34	35	32	ACTIVE	BPR
23	34	37	38	35	ACTIVE	BPR
25	37	40	41	38	ACTIVE	BPR
27	40	43	44	41	ACTIVE	BPR
29	43	46	47	44	ACTIVE	BPR
31	46	49	50	47	ACTIVE	BPR
33	49	52	53	50	ACTIVE	BPR
35	52	55	56	53	ACTIVE	BPR
37	55	58	59	56	ACTIVE	BPR
39	58	61	62	59	ACTIVE	BPR
2	2	5	6	3	ACTIVE	BPR
4	5	8	9	6	ACTIVE	BPR
6	8	11	12	9	ACTIVE	BPR
8	11	14	15	12	ACTIVE	BPR
10	14	17	18	15	ACTIVE	BPR
12	17	20	21	18	ACTIVE	BPR
14	20	23	24	21	ACTIVE	BPR
16	23	26	27	24	ACTIVE	BPR
18	26	29	30	27	ACTIVE	BPR
20	29	32	33	30	ACTIVE	BPR
22	32	35	36	33	ACTIVE	BPR
24	35	38	39	36	ACTIVE	BPR
26	38	41	42	39	ACTIVE	BPR
28	41	44	45	42	ACTIVE	BPR
30	44	47	48	45	ACTIVE	BPR
32	47	50	51	48	ACTIVE	BPR
34	50	53	54	51	ACTIVE	BPR
36	53	56	57	54	ACTIVE	BPR
38	56	59	60	57	ACTIVE	BPR
40	59	62	63	60	ACTIVE	BPR
41	91	92	71	70	ACTIVE	BPR
42	92	93	72	71	ACTIVE	BPR
43	93	94	73	72	ACTIVE	BPR
44	94	95	74	73	ACTIVE	BPR
45	95	96	75	74	ACTIVE	BPR
46	96	97	76	75	ACTIVE	BPR
47	97	98	77	76	ACTIVE	BPR
48	98	99	78	77	ACTIVE	BPR
49	99	100	79	78	ACTIVE	BPR
50	100	101	80	79	ACTIVE	BPR
51	101	102	81	80	ACTIVE	BPR
52	102	103	82	81	ACTIVE	BPR
53	103	104	83	82	ACTIVE	BPR
54	104	105	84	83	ACTIVE	BPR
55	105	106	85	84	ACTIVE	BPR
56	106	107	86	85	ACTIVE	BPR
57						

PAGE - 8

	107	108	87	86	ACTIVE	BPR
58	108	109	88	87	ACTIVE	BPR
59	109	110	89	88	ACTIVE	BPR
60	110	111	90	89	ACTIVE	BPR
61	70	71	5	2	ACTIVE	BPR
62	71	72	8	5	ACTIVE	BPR
63	72	73	11	8	ACTIVE	BPR
64	73	74	14	11	ACTIVE	BPR
65	74	75	17	14	ACTIVE	BPR
66	75	76	20	17	ACTIVE	BPR
67	76	77	23	20	ACTIVE	BPR
68	77	78	26	23	ACTIVE	BPR
69	78	79	29	26	ACTIVE	BPR
70	79	80	32	29	ACTIVE	BPR
71	80	81	35	32	ACTIVE	BPR
72	81	82	38	35	ACTIVE	BPR
73	82	83	41	38	ACTIVE	BPR
74	83	84	44	41	ACTIVE	BPR
75	84	85	47	44	ACTIVE	BPR
76	85	86	50	47	ACTIVE	BPR
77	86	87	53	50	ACTIVE	BPR
78	87	88	56	53	ACTIVE	BPR
79	88	89	59	56	ACTIVE	BPR
80	89	90	62	59	ACTIVE	BPR
101	1	4	5	2	ACTIVE	IPLQCSH
103	4	7	8	5	ACTIVE	IPLQCSH
105	7	10	11	8	ACTIVE	IPLQCSH
107	10	13	14	11	ACTIVE	IPLQCSH
109	13	16	17	14	ACTIVE	IPLQCSH
111	16	19	20	17	ACTIVE	IPLQCSH
113	19	22	23	20	ACTIVE	IPLQCSH
115	22	25	26	23	ACTIVE	IPLQCSH
117	25	28	29	26	ACTIVE	IPLQCSH
119	28	31	32	29	ACTIVE	IPLQCSH
121	31	34	35	32	ACTIVE	IPLQCSH
123	34	37	38	35	ACTIVE	IPLQCSH
125	37	40	41	38	ACTIVE	IPLQCSH
127	40	43	44	41	ACTIVE	IPLQCSH
129	43	46	47	44	ACTIVE	IPLQCSH
131	46	49	50	47	ACTIVE	IPLQCSH
133	49	52	53	50	ACTIVE	IPLQCSH
135	52	55	56	53	ACTIVE	IPLQCSH
137	55	58	59	56	ACTIVE	IPLQCSH
139	58	61	62	59	ACTIVE	IPLQCSH
102	2	5	6	3	ACTIVE	IPLQCSH
104	5	8	9	6	ACTIVE	IPLQCSH
106	8	11	12	9	ACTIVE	IPLQCSH
108	11	14	15	12	ACTIVE	IPLQCSH
110	14	17	18	15	ACTIVE	IPLQCSH
112						

	17	20	21	18	ACTIVE	IPLQCSH
114	20	23	24	21	ACTIVE	IPLQCSH
116	23	26	27	24	ACTIVE	IPLQCSH
118	26	29	30	27	ACTIVE	IPLQCSH
120	29	32	33	30	ACTIVE	IPLQCSH
122	32	35	36	33	ACTIVE	IPLQCSH
124	35	38	39	36	ACTIVE	IPLQCSH
126	38	41	42	39	ACTIVE	IPLQCSH
128	41	44	45	42	ACTIVE	IPLQCSH
130	44	47	48	45	ACTIVE	IPLQCSH
132	47	50	51	48	ACTIVE	IPLQCSH
134	50	53	54	51	ACTIVE	IPLQCSH
136	53	56	57	54	ACTIVE	IPLQCSH
138	56	59	60	57	ACTIVE	IPLQCSH
140	59	62	63	60	ACTIVE	IPLQCSH
141	91	92	71	70	ACTIVE	IPLQCSH
142	92	93	72	71	ACTIVE	IPLQCSH
143	93	94	73	72	ACTIVE	IPLQCSH
144	94	95	74	73	ACTIVE	IPLQCSH
145	95	96	75	74	ACTIVE	IPLQCSH
146	96	97	76	75	ACTIVE	IPLQCSH
147	97	98	77	76	ACTIVE	IPLQCSH
148	98	99	78	77	ACTIVE	IPLQCSH
149	99	100	79	78	ACTIVE	IPLQCSH
150	100	101	80	79	ACTIVE	IPLQCSH
151	101	102	81	80	ACTIVE	IPLQCSH
152	102	103	82	81	ACTIVE	IPLQCSH
153	103	104	83	82	ACTIVE	IPLQCSH
154	104	105	84	83	ACTIVE	IPLQCSH
155	105	106	85	84	ACTIVE	IPLQCSH
156	106	107	86	85	ACTIVE	IPLQCSH
157	107	108	87	86	ACTIVE	IPLQCSH
158	108	109	88	87	ACTIVE	IPLQCSH
159	109	110	89	88	ACTIVE	IPLQCSH
160	110	111	90	89	ACTIVE	IPLQCSH
161	70	71	5	2	ACTIVE	IPLQCSH
162	71	72	8	5	ACTIVE	IPLQCSH
163	72	73	11	8	ACTIVE	IPLQCSH
164	73	74	14	11	ACTIVE	IPLQCSH
165	74	75	17	14	ACTIVE	IPLQCSH
166	75	76	20	17	ACTIVE	IPLQCSH
167	76	77	23	20	ACTIVE	IPLQCSH
168	77	78	26	23	ACTIVE	IPLQCSH
169	78	79	29	26	ACTIVE	IPLQCSH
170	79	80	32	29	ACTIVE	IPLQCSH
171	80	81	35	32	ACTIVE	IPLQCSH
172	81	82	38	35	ACTIVE	IPLQCSH
173	82	83	41	38	ACTIVE	IPLQCSH
174	83	84	44	41	ACTIVE	IPLQCSH
175						

	84	85	47	44	ACTIVE	IPLQCSH
176	85	86	50	47	ACTIVE	IPLQCSH
177	86	87	53	50	ACTIVE	IPLQCSH
178	87	88	56	53	ACTIVE	IPLQCSH
179	88	89	59	56	ACTIVE	IPLQCSH
180	89	90	62	59	ACTIVE	IPLQCSH

ELEMENT PROPERTIES----------/

ELEMENT	TYPE	THICKNESS	/--------CURVATURES--------/			/----------THERMAL EXPANSION COEFFICIENTS----------/					
			K1	K2	K12	CAX	CAY	CAZ	CSXY	CSXZ	CSYZ
1	BPR	1.000									
3	BPR	1.000									
5	BPR	1.000									
7	BPR	1.000									
9	BPR	1.000									
11	BPR	1.000									
13	BPR	1.000									
15	BPR	1.000									
17	BPR	1.000									
19	BPR	1.000									
21	BPR	1.000									
23	BPR	1.000									
25	BPR	1.000									
27	BPR	1.000									
29	BPR	1.000									
31	BPR	1.000									
33	BPR	1.000									
35	BPR	1.000									
37	BPR	1.000									
39	BPR	1.000									
2	BPR	1.000									
4	BPR	1.000									
6	BPR	1.000									
8	BPR	1.000									
10	BPR	1.000									
12	BPR	1.000									
14	BPR	1.000									
16	BPR	1.000									
18	BPR	1.000									
20	BPR	1.000									
22	BPR	1.000									
24	BPR	1.000									
26	BPR	1.000									
28	BPR	1.000									
30											

	BPR	1.000
32	BPR	1.000
34	BPR	1.000
36	BPR	1.000
38	BPR	1.000
40	BPR	1.000
41	BPR	1.000
42	BPR	1.000
43	BPR	1.000
44	BPR	1.000
45	BPR	1.000
46	BPR	1.000
47	BPR	1.000
48	BPR	1.000
49	BPR	1.000
50	BPR	1.000
51	BPR	1.000
52	BPR	1.000
53	BPR	1.000
54	BPR	1.000
55	BPR	1.000
56	BPR	1.000
57	BPR	1.000
58	BPR	1.000
59	BPR	1.000
60	BPR	1.000
61	BPR	1.000
62	BPR	1.000
63	BPR	1.000
64	BPR	1.000
65	BPR	1.000
66	BPR	1.000
67	BPR	1.000
68	BPR	1.000
69	BPR	1.000
70	BPR	1.000
71	BPR	1.000
72	BPR	1.000
73	BPR	1.000
74	BPR	1.000
75	BPR	1.000
76	BPR	1.000
77	BPR	1.000
78	BPR	1.000
79	BPR	1.000
80	BPR	1.000
101	IPLQCSH	1.000
103	IPLQCSH	1.000
105	IPLQCSH	1.000
107		

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          IPLQCSH    1.000
109       IPLQCSH    1.000
111       IPLQCSH    1.000
113       IPLQCSH    1.000
115       IPLQCSH    1.000
117       IPLQCSH    1.000
119       IPLQCSH    1.000
121       IPLQCSH    1.000
123       IPLQCSH    1.000
125       IPLQCSH    1.000
127       IPLQCSH    1.000
129       IPLQCSH    1.000
131       IPLQCSH    1.000
133       IPLQCSH    1.000
135       IPLQCSH    1.000
137       IPLQCSH    1.000
139       IPLQCSH    1.000
102       IPLQCSH    1.000
104       IPLQCSH    1.000
106       IPLQCSH    1.000
108       IPLQCSH    1.000
110       IPLQCSH    1.000
112       IPLQCSH    1.000
114       IPLQCSH    1.000
116       IPLQCSH    1.000
118       IPLQCSH    1.000
120       IPLQCSH    1.000
122       IPLQCSH    1.000
124       IPLQCSH    1.000
126       IPLQCSH    1.000
128       IPLQCSH    1.000
130       IPLQCSH    1.000
132       IPLQCSH    1.000
134       IPLQCSH    1.000
136       IPLQCSH    1.000
138       IPLQCSH    1.000
140       IPLQCSH    1.000
141       IPLQCSH    1.000
142       IPLQCSH    1.000
143       IPLQCSH    1.000
144       IPLQCSH    1.000
145       IPLQCSH    1.000
146       IPLQCSH    1.000
147       IPLQCSH    1.000
148       IPLQCSH    1.000
149       IPLQCSH    1.000
150       IPLQCSH    1.000
151       IPLQCSH    1.000
152       IPLQCSH    1.000
153
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```
          IPLQCSH    1.000
154       IPLQCSH    1.000
155       IPLQCSH    1.000
156       IPLQCSH    1.000
157       IPLQCSH    1.000
158       IPLQCSH    1.000
159       IPLQCSH    1.000
160       IPLQCSH    1.000
161       IPLQCSH    1.000
162       IPLQCSH    1.000
163       IPLQCSH    1.000
164       IPLQCSH    1.000
165       IPLQCSH    1.000
166       IPLQCSH    1.000
167       IPLQCSH    1.000
168       IPLQCSH    1.000
169       IPLQCSH    1.000
170       IPLQCSH    1.000
171       IPLQCSH    1.000
172       IPLQCSH    1.000
173       IPLQCSH    1.000
174       IPLQCSH    1.000
175       IPLQCSH    1.000
176       IPLQCSH    1.000
177       IPLQCSH    1.000
178       IPLQCSH    1.000
179       IPLQCSH    1.000
180       IPLQCSH    1.000

MEMBER CONSTANTS-----------------------------------------------------------------------------------------------/
CONSTANT   STANDARD VALUE   DOMAIN          VALUE       MEMBER LIST


   E         0.300000E+08    ALL

   G         0.115400E+08    ALL

DENSITY      0.999999E+00    ALL

  CTE        0.100000E+01    ALL

  BETA       0.0             ALL

POISSON      0.300000E+00    ALL
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PAGE - 14

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****************************************
*  END OF DATA FROM  INTERNAL STORAGE  *
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PAGE - 15

```
STIFFNESS ANALYSIS REDUCE BAND
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PAGE - 18

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LIST FORCES DISPLACEMENTS STRESSES REACTIONS ALL
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*RESULTS OF LATEST ANALYSES*
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PROBLEM - BEAM TITLE - T BEAM WITH SHELL ELEMENTS

ACTIVE UNITS INCH LB RAD FAHR SEC LBM

LOADING - 1 POINT LOAD AT END OF BEAM

/-ELEMENT-//												
1	NODE	1	MXX	3.293035E+00	MYY	9.879102E-01	MXY	4.000022E-01	VX	2.739680E-02	VY	3.194542E-01
	NODE	4	MXX	4.505233E+00	MYY	-4.620647E-02	MXY	6.282338E-01	VX	2.739680E-02	VY	4.685658E-02
	NODE	5	MXX	3.913890E+00	MYY	8.497015E-01	MXY	-3.416676E-02	VX	-2.452008E-01	VY	4.685658E-02
	NODE	2	MXX	4.890306E+00	MYY	1.467092E+00	MXY	-2.623982E-01	VX	-2.452008E-01	VY	3.194542E-01
3	NODE	4	MXX	4.259101E+00	MYY	-1.200457E-01	MXY	2.313848E-01	VX	-4.747033E-02	VY	1.453068E-01
	NODE	7	MXX	3.794068E+00	MYY	3.642941E-02	MXY	6.578743E-02	VX	-4.747033E-02	VY	3.129045E-02
	NODE	8	MXX	3.826856E+00	MYY	2.070303E-01	MXY	-5.751064E-02	VX	-1.614865E-01	VY	3.129045E-02
	NODE	5	MXX	4.160012E+00	MYY	9.235353E-01	MXY	1.080866E-01	VX	-1.614865E-01	VY	1.453068E-01
5	NODE	7	MXX	3.850149E+00	MYY	5.324745E-02	MXY	5.420830E-02	VX	-8.813256E-02	VY	8.867305E-03
	NODE	10	MXX	3.332074E+00	MYY	-1.536369E-03	MXY	-2.166310E-02	VX	-8.813256E-02	VY	-3.346111E-02
	NODE	11	MXX	3.222776E+00	MYY	-1.097383E-01	MXY	-3.509095E-02	VX	-1.304609E-01	VY	-3.346111E-02
	NODE	8	MXX	3.770811E+00	MYY	1.902227E-01	MXY	4.078046E-02	VX	-1.304609E-01	VY	8.867305E-03
7	NODE	10	MXX	3.366349E+00	MYY	8.742332E-03	MXY	-4.296331E-02	VX	-4.068234E-02	VY	-4.715599E-02
	NODE	13	MXX	3.120288E+00	MYY	-9.634018E-03	MXY	-6.397396E-02	VX	-4.068234E-02	VY	1.640923E-02
	NODE	14	MXX	3.209920E+00	MYY	7.391930E-03	MXY	3.882421E-03	VX	2.288289E-02	VY	1.640923E-02
	NODE	11	MXX	3.188572E+00	MYY	-1.199980E-01	MXY	2.489313E-02	VX	2.288289E-02	VY	-4.715599E-02
9	NODE	13	MXX	3.140636E+00	MYY	-3.538132E-03	MXY	-5.761750E-02	VX	-2.621130E-02	VY	8.303698E-03
	NODE	16	MXX	2.964766E+00	MYY	1.958728E-03	MXY	-4.605434E-02	VX	-2.621130E-02	VY	-4.373003E-03
	NODE	17	MXX	2.944693E+00	MYY	-6.395340E-03	MXY	1.649473E-03	VX	-3.888800E-02	VY	-4.373003E-03
	NODE	14	MXX	3.189729E+00	MYY	1.342773E-03	MXY	-9.913694E-03	VX	-3.888800E-02	VY	8.303698E-03
11	NODE	16	MXX	2.957313E+00	MYY	-4.108548E-04	MXY	-4.573378E-02	VX	-3.027269E-02	VY	-1.286124E-03

PAGE - 20

/-ELEMENT-//----------/

	NODE	19	MXX	2.760416E+00	MYY	-2.871156E-04	MXY	-4.609198E-02	VX	-3.027269E-02	VY	6.590737E-04
	NODE	20	MXX	2.763600E+00	MYY	8.113384E-04	MXY	2.901985E-04	VX	-2.832748E-02	VY	6.590737E-04
	NODE	17	MXX	2.952470E+00	MYY	-3.928483E-03	MXY	6.483993E-04	VX	-2.832748E-02	VY	-1.286124E-03
13	NODE	19	MXX	2.760902E+00	MYY	-2.338886E-04	MXY	-4.576414E-02	VX	-3.009406E-02	VY	5.824757E-04
	NODE	22	MXX	2.564841E+00	MYY	2.174973E-04	MXY	-4.535557E-02	VX	-3.009406E-02	VY	-3.320149E-04
	NODE	23	MXX	2.563372E+00	MYY	-4.741549E-04	MXY	1.371237E-05	VX	-3.100855E-02	VY	-3.320149E-04
	NODE	20	MXX	2.763561E+00	MYY	8.919835E-04	MXY	-3.948600E-04	VX	-3.100855E-02	VY	5.824757E-04
15	NODE	22	MXX	2.564468E+00	MYY	1.329184E-05	MXY	-4.539146E-02	VX	-3.037123E-02	VY	-7.723701E-05
	NODE	25	MXX	2.367042E+00	MYY	2.783537E-05	MXY	-4.546757E-02	VX	-3.037123E-02	VY	-4.329589E-05
	NODE	26	MXX	2.367043E+00	MYY	-2.560616E-04	MXY	1.979899E-05	VX	-3.033729E-02	VY	-4.329589E-05
	NODE	23	MXX	2.564132E+00	MYY	-1.540780E-04	MXY	9.591665E-05	VX	-3.033729E-02	VY	-7.723701E-05
17	NODE	25	MXX	2.367226E+00	MYY	-2.717972E-05	MXY	-4.546988E-02	VX	-3.035679E-02	VY	2.158797E-05
	NODE	28	MXX	2.169849E+00	MYY	3.004074E-05	MXY	-4.548779E-02	VX	-3.035679E-02	VY	-1.219721E-04
	NODE	29	MXX	2.169505E+00	MYY	-4.199147E-04	MXY	-4.197665E-06	VX	-3.050035E-02	VY	-1.219721E-04
	NODE	26	MXX	2.367382E+00	MYY	-4.369020E-05	MXY	1.371237E-05	VX	-3.050035E-02	VY	2.158797E-05
19	NODE	28	MXX	2.169913E+00	MYY	-6.556511E-05	MXY	-4.548835E-02	VX	-3.036555E-02	VY	1.958906E-06
	NODE	31	MXX	1.972524E+00	MYY	-5.209446E-05	MXY	-4.550626E-02	VX	-3.036555E-02	VY	-9.854515E-05
	NODE	32	MXX	1.972243E+00	MYY	-4.125834E-04	MXY	-5.666848E-06	VX	-3.046605E-02	VY	-9.854515E-05
	NODE	29	MXX	2.170012E+00	MYY	-1.527071E-04	MXY	1.224319E-05	VX	-3.046605E-02	VY	1.958906E-06
21	NODE	31	MXX	1.972651E+00	MYY	-9.363890E-05	MXY	-4.548373E-02	VX	-3.040245E-02	VY	-2.214767E-05
	NODE	34	MXX	1.775207E+00	MYY	-2.645850E-04	MXY	-4.548373E-02	VX	-3.040245E-02	VY	7.955575E-06
	NODE	35	MXX	1.775205E+00	MYY	-2.131462E-04	MXY	1.385230E-05	VX	-3.037233E-02	VY	7.955575E-06
	NODE	32	MXX	1.972629E+00	MYY	-2.170205E-04	MXY	1.385230E-05	VX	-3.037233E-02	VY	-2.214767E-05
23	NODE	34	MXX	1.775252E+00	MYY	-2.663732E-04	MXY	-4.551144E-02	VX	-3.032006E-02	VY	8.019536E-05
	NODE	37	MXX	1.578038E+00	MYY	-1.327991E-04	MXY	-4.552935E-02	VX	-3.032006E-02	VY	-1.244108E-04
	NODE	38	MXX	1.577597E+00	MYY	-5.029440E-04	MXY	-3.910823E-05	VX	-3.052466E-02	VY	-1.244108E-04
	NODE	35	MXX	1.775588E+00	MYY	-8.243322E-05	MXY	-2.119820E-05	VX	-3.052466E-02	VY	8.019536E-05
25	NODE	37	MXX	1.578110E+00	MYY	-2.061725E-04	MXY	-4.552165E-02	VX	-3.035184E-02	VY	1.063408E-05
	NODE	40	MXX	1.380848E+00	MYY	-2.315640E-04	MXY	-4.555747E-02	VX	-3.035184E-02	VY	-4.081726E-05
	NODE	41	MXX	1.380641E+00	MYY	-2.893806E-04	MXY	-3.470069E-05	VX	-3.040329E-02	VY	-4.081726E-05
	NODE	38	MXX	1.578198E+00	MYY	-2.278686E-04	MXY	1.119377E-06	VX	-3.040329E-02	VY	1.063408E-05
27	NODE	40	MXX	1.380642E+00	MYY	-2.971888E-04	MXY	-4.561736E-02	VX	-3.014660E-02	VY	1.553135E-04
	NODE	43	MXX	1.184333E+00	MYY	5.900860E-05	MXY	-4.604720E-02	VX	-3.014660E-02	VY	-3.444480E-04
	NODE	44	MXX	1.182422E+00	MYY	-2.692342E-04	MXY	-3.815675E-04	VX	-3.064636E-02	VY	-3.444480E-04
	NODE	41	MXX	1.381410E+00	MYY	-5.483627E-05	MXY	4.827314E-05	VX	-3.064636E-02	VY	1.553135E-04
29	NODE	43	MXX	1.184595E+00	MYY	7.152557E-07	MXY	-4.633278E-02	VX	-3.047517E-02	VY	-3.096673E-04
	NODE	46	MXX	9.867182E-01	MYY	-2.114177E-04	MXY	-4.631487E-02	VX	-3.047517E-02	VY	1.153278E-03
	NODE	47	MXX	9.899669E-01	MYY	4.036486E-03	MXY	2.452135E-04	VX	-2.901222E-02	VY	1.153278E-03

PAGE - 21

/-ELEMENT-//----------/

	NODE	44	MXX	1.182648E+00	MYY	-6.473064E-05	MXY	2.273035E-04	VX	-2.901222E-02	VY	-3.096673E-04
31	NODE	46	MXX	9.878199E-01	MYY	4.434586E-05	MXY	-4.600257E-02	VX	-3.235189E-02	VY	8.310569E-04
	NODE	49	MXX	7.799289E-01	MYY	-2.351403E-03	MXY	-4.412201E-02	VX	-3.235189E-02	VY	1.276728E-03
	NODE	50	MXX	7.853290E-01	MYY	5.473495E-04	MXY	1.185491E-03	VX	-3.190622E-02	VY	1.276728E-03
	NODE	47	MXX	9.893429E-01	MYY	3.923476E-03	MXY	-6.950633E-04	VX	-3.190622E-02	VY	8.310569E-04
33	NODE	49	MXX	7.965847E-01	MYY	2.565742E-03	MXY	-4.195553E-02	VX	-4.325619E-02	VY	-5.808286E-03
	NODE	52	MXX	5.265585E-01	MYY	-8.573711E-03	MXY	-1.046968E-02	VX	-4.325619E-02	VY	1.372163E-02
	NODE	53	MXX	6.315479E-01	MYY	-2.437204E-02	MXY	2.453186E-02	VX	-2.372624E-02	VY	1.372163E-02
	NODE	50	MXX	7.664372E-01	MYY	-5.040765E-03	MXY	-6.953992E-03	VX	-2.372624E-02	VY	-5.808286E-03
35	NODE	52	MXX	4.722924E-01	MYY	-2.492738E-02	MXY	5.936615E-03	VX	-1.486693E-03	VY	3.536572E-02
	NODE	55	MXX	4.105293E-01	MYY	2.717197E-02	MXY	-4.849199E-02	VX	-1.486693E-03	VY	-1.265286E-01
	NODE	56	MXX	-4.816812E-02	MYY	-3.365665E-01	MXY	-6.300157E-02	VX	-1.633809E-01	VY	-1.265286E-01
	NODE	53	MXX	6.853883E-01	MYY	-8.146167E-03	MXY	-8.573029E-03	VX	-1.633809E-01	VY	3.536572E-02
37	NODE	55	MXX	4.785349E-01	MYY	4.710400E-02	MXY	-5.866189E-02	VX	4.776604E-04	VY	-1.530484E-01
	NODE	58	MXX	5.961684E-01	MYY	-6.742442E-02	MXY	-3.964622E-03	VX	4.776604E-04	VY	2.087663E-01
	NODE	59	MXX	1.381159E+00	MYY	5.045664E-01	MXY	9.682244E-02	VX	3.622923E-01	VY	2.087663E-01
	NODE	56	MXX	-1.134843E-01	MYY	-3.556920E-01	MXY	4.212539E-02	VX	3.622923E-01	VY	-1.530484E-01
39	NODE	58	MXX	6.639891E-01	MYY	-4.779816E-02	MXY	2.265343E-02	VX	-6.598103E-02	VY	1.820424E-01
	NODE	61	MXX	1.252900E-01	MYY	6.202377E-02	MXY	1.892526E-01	VX	-6.598103E-02	VY	-1.382317E-01
	NODE	62	MXX	-1.260593E-01	MYY	-5.851347E-01	MXY	4.816647E-02	VX	-3.862552E-01	VY	-1.382317E-01
	NODE	59	MXX	1.314252E+00	MYY	4.852142E-01	MXY	-1.184327E-01	VX	-3.862552E-01	VY	1.820424E-01
2	NODE	2	MXX	4.890306E+00	MYY	1.467092E+00	MXY	2.623966E-01	VX	-2.451973E-01	VY	-3.194064E-01
	NODE	5	MXX	3.913896E+00	MYY	8.497192E-01	MXY	3.424959E-02	VX	-2.451973E-01	VY	-4.686302E-02
	NODE	6	MXX	4.505230E+00	MYY	-4.622650E-02	MXY	-6.281521E-01	VX	2.734601E-02	VY	-4.686302E-02
	NODE	3	MXX	3.293274E+00	MYY	9.879821E-01	MXY	-4.000050E-01	VX	2.734601E-02	VY	-3.194064E-01
4	NODE	5	MXX	4.160016E+00	MYY	9.235555E-01	MXY	-1.080043E-01	VX	-1.614835E-01	VY	-1.453031E-01
	NODE	8	MXX	3.826868E+00	MYY	2.070570E-01	MXY	5.760301E-02	VX	-1.614835E-01	VY	-3.130393E-02
	NODE	9	MXX	3.794037E+00	MYY	3.641129E-02	MXY	-6.568873E-02	VX	-4.748443E-02	VY	-3.130393E-02
	NODE	6	MXX	4.259150E+00	MYY	-1.200504E-01	MXY	-2.312962E-01	VX	-4.748443E-02	VY	-1.453031E-01
6	NODE	8	MXX	3.770806E+00	MYY	1.902342E-01	MXY	-4.068654E-02	VX	-1.304544E-01	VY	-8.858770E-03
	NODE	11	MXX	3.222796E+00	MYY	-1.097097E-01	MXY	3.518486E-02	VX	-1.304544E-01	VY	3.344310E-02
	NODE	12	MXX	3.332023E+00	MYY	-1.561165E-03	MXY	2.175675E-02	VX	-8.815259E-02	VY	3.344310E-02
	NODE	9	MXX	3.850195E+00	MYY	5.326271E-02	MXY	-5.411463E-02	VX	-8.815259E-02	VY	-8.858770E-03
8	NODE	11	MXX	3.188567E+00	MYY	-1.199818E-01	MXY	-2.479001E-02	VX	2.287334E-02	VY	4.714426E-02
	NODE	14	MXX	3.209917E+00	MYY	7.345200E-03	MXY	-3.779296E-03	VX	2.287334E-02	VY	-1.637834E-02
	NODE	15	MXX	3.120353E+00	MYY	-9.552956E-03	MXY	6.407762E-02	VX	-4.064927E-02	VY	-1.637834E-02
	NODE	12	MXX	3.366297E+00	MYY	8.723259E-03	MXY	4.306693E-02	VX	-4.064927E-02	VY	4.714426E-02
10	NODE	14	MXX	3.189540E+00	MYY	1.229286E-03	MXY	9.973176E-03	VX	-3.875917E-02	VY	-8.209858E-03

PAGE - 22

/-ELEMENT-//----------/

	NODE	17	MXX	2.944937E+00	MYY	-6.102860E-03	MXY	-1.601186E-03	VX	-3.875917E-02	VY	4.208665E-03
	NODE	18	MXX	2.964509E+00	MYY	1.680255E-03	MXY	4.610348E-02	VX	-2.634064E-02	VY	4.208665E-03
	NODE	15	MXX	3.140818E+00	MYY	-3.411293E-03	MXY	5.767784E-02	VX	-2.634064E-02	VY	-8.209858E-03
12	NODE	17	MXX	2.952400E+00	MYY	-3.902078E-03	MXY	-5.735278E-04	VX	-2.827836E-02	VY	1.296107E-03
	NODE	20	MXX	2.763723E+00	MYY	9.636283E-04	MXY	-2.265202E-04	VX	-2.827836E-02	VY	-7.385972E-04
	NODE	21	MXX	2.760302E+00	MYY	-4.164577E-04	MXY	4.615666E-02	VX	-3.031306E-02	VY	-7.385972E-04
	NODE	18	MXX	2.957351E+00	MYY	-4.290938E-04	MXY	4.580965E-02	VX	-3.031306E-02	VY	1.296107E-03
14	NODE	20	MXX	2.763416E+00	MYY	7.740259E-04	MXY	4.286165E-04	VX	-3.089362E-02	VY	-4.628780E-04
	NODE	23	MXX	2.563569E+00	MYY	-1.870990E-04	MXY	8.850078E-06	VX	-3.089362E-02	VY	1.480336E-04
	NODE	24	MXX	2.564448E+00	MYY	-1.060963E-04	MXY	4.537876E-02	VX	-3.028270E-02	VY	1.480336E-04
	NODE	21	MXX	2.761223E+00	MYY	-4.249811E-05	MXY	4.579856E-02	VX	-3.028270E-02	VY	-4.628780E-04
16	NODE	23	MXX	2.564016E+00	MYY	-1.733303E-04	MXY	-6.597329E-05	VX	-3.023494E-02	VY	1.450958E-04
	NODE	26	MXX	2.367251E+00	MYY	6.586313E-05	MXY	2.308715E-06	VX	-3.023494E-02	VY	-1.394590E-04
	NODE	27	MXX	2.366713E+00	MYY	-3.052950E-04	MXY	4.549063E-02	VX	-3.051949E-02	VY	-1.394590E-04
	NODE	24	MXX	2.564696E+00	MYY	8.839369E-05	MXY	4.542238E-02	VX	-3.051949E-02	VY	1.450958E-04
18	NODE	26	MXX	2.367270E+00	MYY	-3.618002E-05	MXY	2.206396E-05	VX	-3.041942E-02	VY	2.233070E-05
	NODE	29	MXX	2.169692E+00	MYY	-1.844764E-04	MXY	4.153940E-06	VX	-3.041942E-02	VY	-2.810746E-05
	NODE	30	MXX	2.169538E+00	MYY	-2.157092E-04	MXY	4.548853E-02	VX	-3.046986E-02	VY	-2.810746E-05
	NODE	27	MXX	2.367378E+00	MYY	1.549721E-06	MXY	4.550644E-02	VX	-3.046986E-02	VY	2.233070E-05
20	NODE	29	MXX	2.169931E+00	MYY	-1.614094E-04	MXY	-2.427649E-05	VX	-3.038038E-02	VY	9.440603E-05
	NODE	32	MXX	1.972412E+00	MYY	-1.145005E-04	MXY	-6.366459E-06	VX	-3.038038E-02	VY	-1.010824E-04
	NODE	33	MXX	1.972051E+00	MYY	-4.124045E-04	MXY	4.549496E-02	VX	-3.057586E-02	VY	-1.010824E-04
	NODE	30	MXX	2.170316E+00	MYY	6.622076E-05	MXY	4.547709E-02	VX	-3.057586E-02	VY	9.440603E-05
22	NODE	32	MXX	1.972640E+00	MYY	-1.304746E-04	MXY	7.101051E-06	VX	-3.037091E-02	VY	2.067942E-05
	NODE	35	MXX	1.775243E+00	MYY	-1.437068E-04	MXY	-1.080899E-05	VX	-3.037091E-02	VY	-6.567435E-05
	NODE	36	MXX	1.775018E+00	MYY	-3.487468E-04	MXY	4.548727E-02	VX	-3.045726E-02	VY	-6.567435E-05
	NODE	33	MXX	1.972758E+00	MYY	-1.156926E-04	MXY	4.550521E-02	VX	-3.045726E-02	VY	2.067942E-05
24	NODE	35	MXX	1.775476E+00	MYY	-1.423955E-04	MXY	-8.718901E-06	VX	-3.043177E-02	VY	3.008450E-05
	NODE	38	MXX	1.577772E+00	MYY	-2.450347E-04	MXY	-8.718901E-06	VX	-3.043177E-02	VY	-6.124713E-05
	NODE	39	MXX	1.577574E+00	MYY	-4.458427E-04	MXY	4.548216E-02	VX	-3.052310E-02	VY	-6.124713E-05
	NODE	36	MXX	1.775626E+00	MYY	-9.787083E-05	MXY	4.548216E-02	VX	-3.052310E-02	VY	3.008450E-05
26	NODE	38	MXX	1.578187E+00	MYY	-2.581477E-04	MXY	-3.554023E-05	VX	-3.037363E-02	VY	9.318904E-05
	NODE	41	MXX	1.380678E+00	MYY	-1.775622E-04	MXY	-3.554023E-05	VX	-3.037363E-02	VY	-1.014645E-04
	NODE	42	MXX	1.380302E+00	MYY	-4.620552E-04	MXY	4.548776E-02	VX	-3.056828E-02	VY	-1.014645E-04
	NODE	39	MXX	1.578549E+00	MYY	-1.525879E-05	MXY	4.548779E-02	VX	-3.056828E-02	VY	9.318904E-05
28	NODE	41	MXX	1.381289E+00	MYY	-4.708767E-06	MXY	-1.266995E-04	VX	-3.054457E-02	VY	-6.169843E-05
	NODE	44	MXX	1.182663E+00	MYY	8.088350E-05	MXY	2.852313E-04	VX	-3.054457E-02	VY	9.559956E-05
	NODE	45	MXX	1.183729E+00	MYY	-3.647208E-04	MXY	4.595132E-02	VX	-3.038727E-02	VY	9.559956E-05

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	NODE	42	MXX	1.381096E+00	MYY	-2.136230E-04	MXY	4.553942E-02	VX	-3.038727E-02	VY	-6.169843E-05
30	NODE	44	MXX	1.182577E+00	MYY	-4.792213E-05	MXY	-3.356119E-04	VX	-2.891666E-02	VY	4.490511E-04
	NODE	47	MXX	9.901554E-01	MYY	4.416108E-03	MXY	-3.714322E-04	VX	-2.891666E-02	VY	-1.445976E-03
	NODE	48	MXX	9.859130E-01	MYY	-7.402897E-04	MXY	4.618891E-02	VX	-3.081169E-02	VY	-1.445976E-03
	NODE	45	MXX	1.185253E+00	MYY	1.956224E-04	MXY	4.622473E-02	VX	-3.081169E-02	VY	4.490511E-04
32	NODE	47	MXX	9.892929E-01	MYY	4.022956E-03	MXY	5.917221E-04	VX	-3.184747E-02	VY	-7.621553E-04
	NODE	50	MXX	7.854897E-01	MYY	8.177757E-04	MXY	-1.306742E-03	VX	-3.184747E-02	VY	-1.488150E-03
	NODE	51	MXX	7.793473E-01	MYY	-2.712727E-03	MXY	4.400060E-02	VX	-3.257346E-02	VY	-1.488150E-03
	NODE	48	MXX	9.882632E-01	MYY	9.888411E-05	MXY	4.589906E-02	VX	-3.257346E-02	VY	-7.621553E-04
34	NODE	50	MXX	7.663696E-01	MYY	-5.018890E-03	MXY	6.649625E-03	VX	-2.335473E-02	VY	6.232645E-03
	NODE	53	MXX	6.321517E-01	MYY	-2.260667E-02	MXY	-2.487202E-02	VX	-2.335473E-02	VY	-1.486706E-02
	NODE	54	MXX	5.238498E-01	MYY	-1.094085E-02	MXY	1.012719E-02	VX	-4.445446E-02	VY	-1.486706E-02
	NODE	51	MXX	7.986763E-01	MYY	3.186584E-03	MXY	4.164882E-02	VX	-4.445446E-02	VY	6.232645E-03
36	NODE	53	MXX	6.853253E-01	MYY	-6.790578E-03	MXY	8.561451E-03	VX	-1.633942E-01	VY	-3.607517E-02
	NODE	56	MXX	-4.752848E-02	MYY	-3.360004E-01	MXY	6.297213E-02	VX	-1.633942E-01	VY	1.264662E-01
	NODE	57	MXX	4.114308E-01	MYY	2.707088E-02	MXY	4.845211E-02	VX	-8.528456E-04	VY	1.264662E-01
	NODE	54	MXX	4.707737E-01	MYY	-2.672797E-02	MXY	-5.958550E-03	VX	-8.528456E-04	VY	-3.607517E-02
38	NODE	56	MXX	-1.143378E-01	MYY	-3.561355E-01	MXY	-4.272727E-02	VX	3.633856E-01	VY	1.540226E-01
	NODE	59	MXX	1.383053E+00	MYY	5.084805E-01	MXY	-9.747821E-02	VX	3.633856E-01	VY	-2.111792E-01
	NODE	60	MXX	5.912162E-01	MYY	-7.234913E-02	MXY	3.272290E-03	VX	-1.816366E-03	VY	-2.111792E-01
	NODE	57	MXX	4.822620E-01	MYY	4.841250E-02	MXY	5.802305E-02	VX	-1.816366E-03	VY	1.540226E-01
40	NODE	59	MXX	1.313128E+00	MYY	4.855652E-01	MXY	1.177787E-01	VX	-3.849517E-01	VY	-1.814699E-01
	NODE	62	MXX	-1.233366E-01	MYY	-5.801575E-01	MXY	-4.862345E-02	VX	-3.849517E-01	VY	1.355894E-01
	NODE	63	MXX	1.213093E-01	MYY	5.652836E-02	MXY	-1.897279E-01	VX	-6.789237E-02	VY	1.355894E-01
	NODE	60	MXX	6.668572E-01	MYY	-4.771870E-02	MXY	-2.332580E-02	VX	-6.789237E-02	VY	-1.814699E-01
41	NODE	91	MXX	-1.640989E-04	MYY	-4.922965E-05	MXY	-4.955253E-06	VX	2.795838E-05	VY	1.567051E-05
	NODE	92	MXX	-4.147794E-05	MYY	9.879041E-06	MXY	3.108718E-05	VX	2.795838E-05	VY	-1.298179E-06
	NODE	71	MXX	-2.618709E-05	MYY	-1.385000E-05	MXY	3.736741E-05	VX	1.098971E-05	VY	-1.298179E-06
	NODE	70	MXX	-8.574632E-05	MYY	-2.572389E-05	MXY	1.324961E-06	VX	1.098971E-05	VY	1.567051E-05
42	NODE	92	MXX	-4.986137E-05	MYY	7.364026E-06	MXY	3.997222E-05	VX	5.387565E-06	VY	1.530634E-07
	NODE	93	MXX	-7.430978E-06	MYY	-4.719823E-08	MXY	5.237803E-05	VX	5.387565E-06	VY	1.031837E-06
	NODE	72	MXX	-3.389114E-06	MYY	2.617890E-06	MXY	4.833500E-05	VX	6.266336E-06	VY	1.031837E-06
	NODE	71	MXX	-2.731425E-05	MYY	-1.418817E-05	MXY	3.592919E-05	VX	6.266336E-06	VY	1.530634E-07
43	NODE	93	MXX	-1.150093E-05	MYY	-1.268337E-06	MXY	4.903610E-05	VX	2.727592E-06	VY	1.883395E-06
	NODE	94	MXX	4.330804E-06	MYY	6.292881E-07	MXY	5.075798E-05	VX	2.727592E-06	VY	6.118275E-07
	NODE	73	MXX	3.218000E-06	MYY	5.718972E-06	MXY	5.009140E-05	VX	1.456023E-06	VY	6.118275E-07
	NODE	72	MXX	-3.201520E-06	MYY	2.674325E-06	MXY	4.836950E-05	VX	1.456023E-06	VY	1.883395E-06
44	NODE	94	MXX	2.796227E-06	MYY	1.692706E-07	MXY	5.050014E-05	VX	8.367805E-07	VY	9.661126E-07

PAGE - 24

/-ELEMENT-//----------/

	NODE	95	MXX	8.288554E-06	MYY	1.160197E-07	MXY	4.837007E-05	VX	8.367805E-07	VY	7.562001E-07
	NODE	74	MXX	5.952743E-06	MYY	7.367134E-06	MXY	4.803436E-05	VX	6.268680E-07	VY	7.562001E-07
	NODE	73	MXX	3.455397E-06	MYY	5.789835E-06	MXY	5.016442E-05	VX	6.268680E-07	VY	9.661126E-07
45	NODE	95	MXX	7.731315E-06	MYY	-5.168567E-08	MXY	4.814635E-05	VX	4.003437E-07	VY	8.782901E-07
	NODE	96	MXX	1.021275E-05	MYY	6.911250E-08	MXY	4.458008E-05	VX	4.003437E-07	VY	8.086614E-07
	NODE	75	MXX	7.336813E-06	MYY	8.201352E-06	MXY	4.450117E-05	VX	3.307142E-07	VY	8.086614E-07
	NODE	74	MXX	6.005137E-06	MYY	7.383384E-06	MXY	4.806745E-05	VX	3.307142E-07	VY	8.782901E-07
46	NODE	96	MXX	9.961444E-06	MYY	-5.792572E-09	MXY	4.452128E-05	VX	2.699280E-07	VY	8.551780E-07
	NODE	97	MXX	1.167503E-05	MYY	3.515197E-08	MXY	4.026713E-05	VX	2.699280E-07	VY	8.979277E-07
	NODE	76	MXX	8.439026E-06	MYY	9.107688E-06	MXY	4.030677E-05	VX	3.126775E-07	VY	8.979277E-07
	NODE	75	MXX	7.318840E-06	MYY	8.195470E-06	MXY	4.456090E-05	VX	3.126775E-07	VY	8.551780E-07
47	NODE	97	MXX	1.148888E-05	MYY	-2.078468E-08	MXY	4.024035E-05	VX	2.484164E-07	VY	9.300787E-07
	NODE	98	MXX	1.305009E-05	MYY	3.271089E-08	MXY	3.546395E-05	VX	2.484164E-07	VY	9.933829E-07
	NODE	77	MXX	9.457835E-06	MYY	1.008195E-05	MXY	3.556150E-05	VX	3.117209E-07	VY	9.933829E-07
	NODE	76	MXX	8.413484E-06	MYY	9.100115E-06	MXY	4.033792E-05	VX	3.117209E-07	VY	9.300787E-07
48	NODE	98	MXX	1.287008E-05	MYY	-2.137949E-08	MXY	3.545503E-05	VX	2.391052E-07	VY	1.026049E-06
	NODE	99	MXX	1.437222E-05	MYY	3.064997E-08	MXY	3.018140E-05	VX	2.391052E-07	VY	1.094156E-06
	NODE	78	MXX	1.043434E-05	MYY	1.108056E-05	MXY	3.029946E-05	VX	3.072118E-07	VY	1.094156E-06
	NODE	77	MXX	9.441030E-06	MYY	1.007700E-05	MXY	3.557309E-05	VX	3.072118E-07	VY	1.026049E-06
49	NODE	99	MXX	1.419371E-05	MYY	-2.290381E-08	MXY	3.017785E-05	VX	2.268853E-07	VY	1.127936E-06
	NODE	100	MXX	1.561728E-05	MYY	2.828983E-08	MXY	2.441941E-05	VX	2.268853E-07	VY	1.191677E-06
	NODE	79	MXX	1.134880E-05	MYY	1.204270E-05	MXY	2.453936E-05	VX	2.906290E-07	VY	1.191677E-06
	NODE	78	MXX	1.042473E-05	MYY	1.107768E-05	MXY	3.029782E-05	VX	2.906290E-07	VY	1.127936E-06
50	NODE	100	MXX	1.544887E-05	MYY	-2.223351E-08	MXY	2.441749E-05	VX	2.097757E-07	VY	1.224562E-06
	NODE	101	MXX	1.676446E-05	MYY	2.570323E-08	MXY	1.819905E-05	VX	2.097757E-07	VY	1.283825E-06
	NODE	80	MXX	1.219425E-05	MYY	1.294080E-05	MXY	1.831356E-05	VX	2.690396E-07	VY	1.283825E-06
	NODE	79	MXX	1.134479E-05	MYY	1.204150E-05	MXY	2.453198E-05	VX	2.690396E-07	VY	1.224562E-06
51	NODE	101	MXX	1.660810E-05	MYY	-2.120305E-08	MXY	1.819768E-05	VX	1.907824E-07	VY	1.314394E-06
	NODE	102	MXX	1.780197E-05	MYY	2.502475E-08	MXY	1.155672E-05	VX	1.907824E-07	VY	1.367624E-06
	NODE	81	MXX	1.296044E-05	MYY	1.375614E-05	MXY	1.166193E-05	VX	2.440145E-07	VY	1.367624E-06
	NODE	80	MXX	1.219074E-05	MYY	1.293975E-05	MXY	1.830289E-05	VX	2.440145E-07	VY	1.314394E-06
52	NODE	102	MXX	1.766438E-05	MYY	-1.625449E-08	MXY	1.155508E-05	VX	1.621466E-07	VY	1.393861E-06
	NODE	103	MXX	1.868281E-05	MYY	1.926946E-08	MXY	4.545064E-06	VX	1.621466E-07	VY	1.446917E-06
	NODE	82	MXX	1.363433E-05	MYY	1.447274E-05	MXY	4.639075E-06	VX	2.152047E-07	VY	1.446917E-06
	NODE	81	MXX	1.295402E-05	MYY	1.375422E-05	MXY	1.164909E-05	VX	2.152047E-07	VY	1.393861E-06
53	NODE	103	MXX	1.858704E-05	MYY	-9.459654E-09	MXY	4.542878E-06	VX	1.133242E-07	VY	1.463066E-06
	NODE	104	MXX	1.930834E-05	MYY	5.848051E-09	MXY	-2.744114E-06	VX	1.133242E-07	VY	1.522553E-06
	NODE	83	MXX	1.418055E-05	MYY	1.503025E-05	MXY	-2.670053E-06	VX	1.728132E-07	VY	1.522553E-06

PAGE - 25

/-ELEMENT-//----------/

	NODE	82	MXX	1.361929E-05	MYY	1.446823E-05	MXY	4.616938E-06	VX	1.728132E-07	VY	1.463066E-06
54	NODE	104	MXX	1.930138E-05	MYY	3.760761E-09	MXY	-2.744387E-06	VX	9.786422E-09	VY	1.513838E-06
	NODE	105	MXX	1.939130E-05	MYY	-2.255274E-08	MXY	-1.010596E-05	VX	9.786422E-09	VY	1.593598E-06
	NODE	84	MXX	1.450069E-05	MYY	1.522648E-05	MXY	-1.008792E-05	VX	8.954913E-08	VY	1.593598E-06
	NODE	83	MXX	1.413001E-05	MYY	1.501509E-05	MXY	-2.726350E-06	VX	8.954913E-08	VY	1.513838E-06
55	NODE	105	MXX	1.960837E-05	MYY	4.256435E-08	MXY	-1.009066E-05	VX	-2.457421E-07	VY	1.519275E-06
	NODE	106	MXX	1.816265E-05	MYY	-1.090593E-07	MXY	-1.703351E-05	VX	-2.457421E-07	VY	1.647522E-06
	NODE	85	MXX	1.428938E-05	MYY	1.447315E-05	MXY	-1.719038E-05	VX	-1.174930E-07	VY	1.647522E-06
	NODE	84	MXX	1.434613E-05	MYY	1.518011E-05	MXY	-1.024752E-05	VX	-1.174930E-07	VY	1.519275E-06
56	NODE	106	MXX	1.888526E-05	MYY	1.077187E-07	MXY	-1.697477E-05	VX	-8.077436E-07	VY	1.428574E-06
	NODE	107	MXX	1.402560E-05	MYY	-2.829483E-07	MXY	-2.238875E-05	VX	-8.077436E-07	VY	1.566200E-06
	NODE	86	MXX	1.265783E-05	MYY	1.126515E-05	MXY	-2.302387E-05	VX	-6.701153E-07	VY	1.566200E-06
	NODE	85	MXX	1.391723E-05	MYY	1.436150E-05	MXY	-1.760988E-05	VX	-6.701153E-07	VY	1.428574E-06
57	NODE	107	MXX	1.554031E-05	MYY	1.714716E-07	MXY	-2.226880E-05	VX	-1.733370E-06	VY	1.140390E-06
	NODE	108	MXX	4.844600E-06	MYY	-3.997156E-07	MXY	-2.428949E-05	VX	-1.733370E-06	VY	8.883113E-07
	NODE	87	MXX	7.343115E-06	MYY	2.875817E-06	MXY	-2.588847E-05	VX	-1.985446E-06	VY	8.883113E-07
	NODE	86	MXX	1.204350E-05	MYY	1.108085E-05	MXY	-2.386779E-05	VX	-1.985446E-06	VY	1.140390E-06
58	NODE	108	MXX	6.613148E-06	MYY	1.308490E-07	MXY	-2.425560E-05	VX	-2.369052E-06	VY	5.200720E-07
	NODE	109	MXX	-8.672786E-06	MYY	1.793433E-08	MXY	-2.162266E-05	VX	-2.369052E-06	VY	-1.246483E-06
	NODE	88	MXX	-5.153833E-06	MYY	-1.160317E-05	MXY	-2.402921E-05	VX	-4.135605E-06	VY	-1.246483E-06
	NODE	87	MXX	7.270450E-06	MYY	2.854017E-06	MXY	-2.666215E-05	VX	-4.135605E-06	VY	5.200720E-07
59	NODE	109	MXX	-8.101716E-06	MYY	1.892549E-07	MXY	-2.070797E-05	VX	-1.582225E-06	VY	-1.233737E-06
	NODE	110	MXX	-1.612652E-05	MYY	-2.070396E-06	MXY	-1.586294E-05	VX	-1.582225E-06	VY	-3.627481E-06
	NODE	89	MXX	-1.731096E-05	MYY	-2.446461E-05	MXY	-1.935005E-05	VX	-3.975971E-06	VY	-3.627481E-06
	NODE	88	MXX	-4.519029E-06	MYY	-1.141273E-05	MXY	-2.419511E-05	VX	-3.975971E-06	VY	-1.233737E-06
60	NODE	110	MXX	-1.585839E-05	MYY	-1.989602E-06	MXY	-1.434155E-05	VX	3.901734E-06	VY	-3.571607E-06
	NODE	111	MXX	3.285721E-06	MYY	4.227566E-06	MXY	-8.188607E-06	VX	3.901734E-06	VY	-7.480975E-06
	NODE	90	MXX	-8.290590E-08	MYY	-4.103011E-05	MXY	-1.636530E-05	VX	-7.631570E-09	VY	-7.480975E-06
	NODE	89	MXX	-1.676271E-05	MYY	-2.430071E-05	MXY	-2.251826E-05	VX	-7.631570E-09	VY	-3.571607E-06
61	NODE	70	MXX	-8.574617E-05	MYY	-2.572384E-05	MXY	-9.360029E-07	VX	1.136329E-05	VY	1.825549E-05
	NODE	71	MXX	-2.562678E-05	MYY	-1.198184E-05	MXY	3.736564E-05	VX	1.136329E-05	VY	8.066800E-06
	NODE	5	MXX	-8.175730E-07	MYY	1.564316E-05	MXY	4.182510E-05	VX	1.174578E-06	VY	8.066800E-06
	NODE	2	MXX	5.531398E-06	MYY	1.659419E-06	MXY	3.523470E-06	VX	1.174578E-06	VY	1.825549E-05
62	NODE	71	MXX	-2.675384E-05	MYY	-1.231996E-05	MXY	3.660710E-05	VX	5.598339E-06	VY	1.041962E-05
	NODE	72	MXX	-3.830623E-06	MYY	1.146042E-06	MXY	4.766608E-05	VX	5.598339E-06	VY	3.331611E-06
	NODE	8	MXX	2.340867E-06	MYY	1.663003E-05	MXY	5.021544E-05	VX	-1.489670E-06	VY	3.331611E-06
	NODE	5	MXX	9.819481E-06	MYY	1.883428E-05	MXY	3.915647E-05	VX	-1.489670E-06	VY	1.041962E-05
63	NODE	72	MXX	-3.643270E-06	MYY	1.202114E-06	MXY	4.892582E-05	VX	1.792410E-06	VY	4.033018E-06

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	NODE	73	MXX	3.280962E-06	MYY	5.928552E-06	MXY	4.990152E-05	VX	1.792410E-06	VY	1.515619E-06
	NODE	11	MXX	3.876969E-06	MYY	1.518408E-05	MXY	5.018699E-05	VX	-7.249872E-07	VY	1.515619E-06
	NODE	8	MXX	6.035047E-06	MYY	1.773842E-05	MXY	4.921132E-05	VX	-7.249872E-07	VY	4.033018E-06
64	NODE	73	MXX	3.518775E-06	MYY	6.000208E-06	MXY	5.021134E-05	VX	5.810145E-07	VY	1.679953E-06
	NODE	74	MXX	5.946931E-06	MYY	7.348647E-06	MXY	4.809642E-05	VX	5.810145E-07	VY	9.064777E-07
	NODE	14	MXX	4.178588E-06	MYY	1.500910E-05	MXY	4.823289E-05	VX	-1.924612E-07	VY	9.064777E-07
	NODE	11	MXX	4.936921E-06	MYY	1.550176E-05	MXY	5.034781E-05	VX	-1.924612E-07	VY	1.679953E-06
65	NODE	74	MXX	5.999535E-06	MYY	7.364119E-06	MXY	4.797323E-05	VX	3.414895E-07	VY	9.865207E-07
	NODE	75	MXX	7.347099E-06	MYY	8.236233E-06	MXY	4.459199E-05	VX	3.414895E-07	VY	7.990085E-07
	NODE	17	MXX	4.631515E-06	MYY	1.614538E-05	MXY	4.515659E-05	VX	1.539766E-07	VY	7.990085E-07
	NODE	14	MXX	4.630930E-06	MYY	1.514511E-05	MXY	4.853783E-05	VX	1.539766E-07	VY	9.865207E-07
66	NODE	75	MXX	7.329792E-06	MYY	8.231086E-06	MXY	4.447978E-05	VX	3.062553E-07	VY	8.591020E-07
	NODE	76	MXX	8.439936E-06	MYY	9.111602E-06	MXY	4.035819E-05	VX	3.062553E-07	VY	8.771980E-07
	NODE	20	MXX	5.216288E-06	MYY	1.803703E-05	MXY	4.122886E-05	VX	3.243507E-07	VY	8.771980E-07
	NODE	17	MXX	4.914742E-06	MYY	1.623029E-05	MXY	4.535045E-05	VX	3.243507E-07	VY	8.591020E-07
67	NODE	76	MXX	8.415066E-06	MYY	9.104498E-06	MXY	4.030237E-05	VX	3.106669E-07	VY	9.290723E-07
	NODE	77	MXX	9.457424E-06	MYY	1.008147E-05	MXY	3.557600E-05	VX	3.106669E-07	VY	9.937821E-07
	NODE	23	MXX	5.852691E-06	MYY	2.014579E-05	MXY	3.656927E-05	VX	3.753769E-07	VY	9.937821E-07
	NODE	20	MXX	5.451342E-06	MYY	1.810718E-05	MXY	4.129564E-05	VX	3.753769E-07	VY	9.290723E-07
68	NODE	77	MXX	9.440795E-06	MYY	1.007622E-05	MXY	3.556896E-05	VX	3.062747E-07	VY	1.039274E-06
	NODE	78	MXX	1.043270E-05	MYY	1.107510E-05	MXY	3.029197E-05	VX	3.062747E-07	VY	1.108052E-06
	NODE	26	MXX	6.477403E-06	MYY	2.223275E-05	MXY	3.129219E-05	VX	3.750548E-07	VY	1.108052E-06
	NODE	23	MXX	6.063112E-06	MYY	2.020919E-05	MXY	3.656917E-05	VX	3.750548E-07	VY	1.039274E-06
69	NODE	78	MXX	1.042309E-05	MYY	1.107221E-05	MXY	3.031000E-05	VX	2.900045E-07	VY	1.148695E-06
	NODE	79	MXX	1.134622E-05	MYY	1.203411E-05	MXY	2.452215E-05	VX	2.900045E-07	VY	1.213141E-06
	NODE	29	MXX	7.065348E-06	MYY	2.420042E-05	MXY	2.547454E-05	VX	3.544511E-07	VY	1.213141E-06
	NODE	26	MXX	6.670996E-06	MYY	2.229083E-05	MXY	3.126240E-05	VX	3.544511E-07	VY	1.148695E-06
70	NODE	79	MXX	1.134222E-05	MYY	1.203291E-05	MXY	2.455086E-05	VX	2.685712E-07	VY	1.249479E-06
	NODE	80	MXX	1.219097E-05	MYY	1.292987E-05	MXY	1.829208E-05	VX	2.685712E-07	VY	1.308477E-06
	NODE	32	MXX	7.609566E-06	MYY	2.601639E-05	MXY	1.917480E-05	VX	3.275713E-07	VY	1.308477E-06
	NODE	29	MXX	7.243032E-06	MYY	2.425372E-05	MXY	2.543356E-05	VX	3.275713E-07	VY	1.249479E-06
71	NODE	80	MXX	1.218744E-05	MYY	1.292881E-05	MXY	1.832489E-05	VX	2.448058E-07	VY	1.341505E-06
	NODE	81	MXX	1.295836E-05	MYY	1.374913E-05	MXY	1.163772E-05	VX	2.448058E-07	VY	1.394692E-06
	NODE	35	MXX	8.104573E-06	MYY	2.766840E-05	MXY	1.244254E-05	VX	2.979938E-07	VY	1.394692E-06
	NODE	32	MXX	7.771146E-06	MYY	2.606487E-05	MXY	1.912971E-05	VX	2.979938E-07	VY	1.341505E-06
72	NODE	81	MXX	1.295190E-05	MYY	1.374719E-05	MXY	1.167543E-05	VX	2.145827E-07	VY	1.424464E-06
	NODE	82	MXX	1.363129E-05	MYY	1.446259E-05	MXY	4.606613E-06	VX	2.145827E-07	VY	1.482030E-06
	NODE	38	MXX	8.558311E-06	MYY	2.916878E-05	MXY	5.328086E-06	VX	2.721483E-07	VY	1.482030E-06

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	NODE	35	MXX	8.246987E-06	MYY	2.771112E-05	MXY	1.239691E-05	VX	2.721483E-07	VY	1.424464E-06
73	NODE	82	MXX	1.361623E-05	MYY	1.445808E-05	MXY	4.658539E-06	VX	1.703172E-07	VY	1.509447E-06
	NODE	83	MXX	1.417377E-05	MYY	1.500761E-05	MXY	-2.734405E-06	VX	1.703172E-07	VY	1.582875E-06
	NODE	41	MXX	8.962260E-06	MYY	3.050783E-05	MXY	-2.118966E-06	VX	2.437479E-07	VY	1.582875E-06
	NODE	38	MXX	8.680341E-06	MYY	2.920537E-05	MXY	5.273978E-06	VX	2.437479E-07	VY	1.509447E-06
74	NODE	83	MXX	1.412389E-05	MYY	1.499478E-05	MXY	-2.631104E-06	VX	8.628433E-08	VY	1.613814E-06
	NODE	84	MXX	1.448972E-05	MYY	1.518979E-05	MXY	-1.026236E-05	VX	8.628433E-08	VY	1.726492E-06
	NODE	44	MXX	9.291217E-06	MYY	3.161050E-05	MXY	-9.842592E-06	VX	1.989657E-07	VY	1.726492E-06
	NODE	41	MXX	9.070332E-06	MYY	3.053813E-05	MXY	-2.211337E-06	VX	1.989657E-07	VY	1.613814E-06
75	NODE	84	MXX	1.433514E-05	MYY	1.514342E-05	MXY	-9.981147E-06	VX	-1.321853E-07	VY	1.775124E-06
	NODE	85	MXX	1.425631E-05	MYY	1.436304E-05	MXY	-1.768470E-05	VX	-1.321853E-07	VY	2.001721E-06
	NODE	47	MXX	9.469819E-06	MYY	3.216077E-05	MXY	-1.778470E-05	VX	9.441510E-08	VY	2.001721E-06
	NODE	44	MXX	9.379796E-06	MYY	3.163707E-05	MXY	-1.008117E-05	VX	9.441510E-08	VY	1.775124E-06
76	NODE	85	MXX	1.388420E-05	MYY	1.425141E-05	MXY	-1.689354E-05	VX	-7.257118E-07	VY	2.079748E-06
	NODE	86	MXX	1.254140E-05	MYY	1.087708E-05	MXY	-2.425400E-05	VX	-7.257118E-07	VY	2.548097E-06
	NODE	50	MXX	9.158595E-06	MYY	3.082251E-05	MXY	-2.587569E-05	VX	-2.573615E-07	VY	2.548097E-06
	NODE	47	MXX	9.487811E-06	MYY	3.216616E-05	MXY	-1.851522E-05	VX	-2.573615E-07	VY	2.079748E-06
77	NODE	86	MXX	1.192708E-05	MYY	1.069278E-05	MXY	-2.227079E-05	VX	-2.113501E-06	VY	2.612608E-06
	NODE	87	MXX	7.034614E-06	MYY	1.847483E-06	MXY	-2.819661E-05	VX	-2.113501E-06	VY	3.099280E-06
	NODE	53	MXX	6.811094E-06	MYY	2.221632E-05	MXY	-3.407334E-05	VX	-1.626828E-06	VY	3.099280E-06
	NODE	50	MXX	8.866827E-06	MYY	3.073498E-05	MXY	-2.814752E-05	VX	-1.626828E-06	VY	2.612608E-06
78	NODE	87	MXX	6.961949E-06	MYY	1.825683E-06	MXY	-2.431187E-05	VX	-4.491972E-06	VY	2.788536E-06
	NODE	88	MXX	-5.996880E-06	MYY	-1.441332E-05	MXY	-2.581117E-05	VX	-4.491972E-06	VY	1.842127E-06
	NODE	56	MXX	-2.722609E-07	MYY	-8.164099E-06	MXY	-4.142917E-05	VX	-5.438376E-06	VY	1.842127E-06
	NODE	53	MXX	5.184705E-06	MYY	2.172841E-05	MXY	-3.992986E-05	VX	-5.438376E-06	VY	2.788536E-06
79	NODE	88	MXX	-5.360026E-06	MYY	-1.422227E-05	MXY	-2.279686E-05	VX	-2.575851E-06	VY	1.345452E-06
	NODE	89	MXX	-1.605465E-05	MYY	-2.027067E-05	MXY	-2.004168E-05	VX	-2.575851E-06	VY	-1.271309E-05
	NODE	59	MXX	-3.083701E-05	MYY	-8.812343E-05	MXY	-4.836090E-05	VX	-1.663438E-05	VY	-1.271309E-05
	NODE	56	MXX	-2.118792E-06	MYY	-8.718059E-06	MXY	-5.111606E-05	VX	-1.663438E-05	VY	1.345452E-06
80	NODE	89	MXX	-1.550569E-05	MYY	-2.010528E-05	MXY	-2.215739E-05	VX	-7.995550E-07	VY	-1.309691E-05
	NODE	90	MXX	-1.130866E-08	MYY	-4.079677E-05	MXY	-1.633323E-05	VX	-7.995550E-07	VY	-7.923942E-06
	NODE	62	MXX	-3.194145E-06	MYY	-8.911960E-05	MXY	-2.965162E-05	VX	4.373414E-06	VY	-7.923942E-06
	NODE	59	MXX	-3.220582E-05	MYY	-8.853509E-05	MXY	-3.547578E-05	VX	4.373414E-06	VY	-1.309691E-05

101	NODE	1	SXX	0.121594E+03	SYY	0.364783E+02	SXY	0.142723E+02
		4	SXX	0.109361E+03	SYY	-0.429964E+01	SXY	0.137288E+02
		5	SXX	0.107808E+03	SYY	-0.476550E+01	SXY	-0.543492E+00
		2	SXX	0.120041E+03	SYY	0.360124E+02	SXY	0.175259E-04
103	NODE	4	SXX	0.102628E+03	SYY	-0.631958E+01	SXY	-0.219833E+01

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		7	SXX	0.104046E+03	SYY	-0.159145E+01	SXY	0.202197E+01
		8	SXX	0.116104E+03	SYY	0.202596E+01	SXY	0.367681E+01
		5	SXX	0.114686E+03	SYY	-0.270218E+01	SXY	-0.543485E+00
105	NODE	7	SXX	0.103510E+03	SYY	-0.175232E+01	SXY	0.259704E+01
		10	SXX	0.104436E+03	SYY	0.133275E+01	SXY	0.225796E+01
		11	SXX	0.103467E+03	SYY	0.104211E+01	SXY	0.333774E+01
		8	SXX	0.102541E+03	SYY	-0.204295E+01	SXY	0.367681E+01
107	NODE	10	SXX	0.974612E+02	SYY	-0.759552E+00	SXY	0.272609E+01
		13	SXX	0.979855E+02	SYY	0.987991E+00	SXY	0.267599E+01
		14	SXX	0.978423E+02	SYY	0.945038E+00	SXY	0.328763E+01
		11	SXX	0.973180E+02	SYY	-0.802505E+00	SXY	0.333774E+01
109	NODE	13	SXX	0.914144E+02	SYY	-0.983322E+00	SXY	0.260519E+01
		16	SXX	0.919994E+02	SYY	0.966537E+00	SXY	0.261592E+01
		17	SXX	0.920293E+02	SYY	0.975525E+00	SXY	0.329830E+01
		14	SXX	0.914444E+02	SYY	-0.974335E+00	SXY	0.328764E+01
111	NODE	16	SXX	0.855119E+02	SYY	-0.979691E+00	SXY	0.261457E+01
		19	SXX	0.860981E+02	SYY	0.974167E+00	SXY	0.261750E+01
		20	SXX	0.861059E+02	SYY	0.976501E+00	SXY	0.330122E+01
		17	SXX	0.855197E+02	SYY	-0.977356E+00	SXY	0.329838E+01
113	NODE	19	SXX	0.795988E+02	SYY	-0.975632E+00	SXY	0.261817E+01
		22	SXX	0.801843E+02	SYY	0.976196E+00	SXY	0.261726E+01
		23	SXX	0.801813E+02	SYY	0.975281E+00	SXY	0.330031E+01
		20	SXX	0.795957E+02	SYY	-0.976547E+00	SXY	0.330130E+01
115	NODE	22	SXX	0.736801E+02	SYY	-0.975067E+00	SXY	0.261760E+01
		25	SXX	0.742652E+02	SYY	0.975464E+00	SXY	0.261763E+01
		26	SXX	0.742648E+02	SYY	0.975327E+00	SXY	0.330034E+01
		23	SXX	0.736796E+02	SYY	-0.975204E+00	SXY	0.330038E+01
117	NODE	25	SXX	0.677622E+02	SYY	-0.975464E+00	SXY	0.261763E+01
		28	SXX	0.683475E+02	SYY	0.975510E+00	SXY	0.261756E+01
		29	SXX	0.683472E+02	SYY	0.975433E+00	SXY	0.330044E+01
		26	SXX	0.677619E+02	SYY	-0.975540E+00	SXY	0.330041E+01
119	NODE	28	SXX	0.618447E+02	SYY	-0.975327E+00	SXY	0.261773E+01
		31	SXX	0.624299E+02	SYY	0.975571E+00	SXY	0.261756E+01
		32	SXX	0.624294E+02	SYY	0.975403E+00	SXY	0.330044E+01
		29	SXX	0.618441E+02	SYY	-0.975494E+00	SXY	0.330050E+01
121	NODE	31	SXX	0.559268E+02	SYY	-0.975372E+00	SXY	0.261756E+01
		34	SXX	0.565120E+02	SYY	0.975555E+00	SXY	0.261763E+01
		35	SXX	0.565114E+02	SYY	0.975357E+00	SXY	0.330050E+01

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		32	SXX	0.559261E+02	SYY	-0.975571E+00	SXY	0.330050E+01
123	NODE	34	SXX	0.500092E+02	SYY	-0.975311E+00	SXY	0.261780E+01
		37	SXX	0.505945E+02	SYY	0.975605E+00	SXY	0.261760E+01
		38	SXX	0.505937E+02	SYY	0.975376E+00	SXY	0.330047E+01
		35	SXX	0.500084E+02	SYY	-0.975540E+00	SXY	0.330057E+01
125	NODE	37	SXX	0.440912E+02	SYY	-0.975368E+00	SXY	0.261776E+01
		40	SXX	0.446765E+02	SYY	0.975608E+00	SXY	0.261760E+01
		41	SXX	0.446758E+02	SYY	0.975410E+00	SXY	0.330047E+01
		38	SXX	0.440905E+02	SYY	-0.975567E+00	SXY	0.330054E+01
127	NODE	40	SXX	0.381739E+02	SYY	-0.975164E+00	SXY	0.261743E+01
		43	SXX	0.387593E+02	SYY	0.976194E+00	SXY	0.261719E+01
		44	SXX	0.387579E+02	SYY	0.975790E+00	SXY	0.330006E+01
		41	SXX	0.381725E+02	SYY	-0.975569E+00	SXY	0.330055E+01
129	NODE	43	SXX	0.322564E+02	SYY	-0.974677E+00	SXY	0.261904E+01
		46	SXX	0.328403E+02	SYY	0.971511E+00	SXY	0.261870E+01
		47	SXX	0.328392E+02	SYY	0.971196E+00	SXY	0.329989E+01
		44	SXX	0.322554E+02	SYY	-0.974992E+00	SXY	0.330016E+01
131	NODE	46	SXX	0.263216E+02	SYY	-0.984094E+00	SXY	0.261384E+01
		49	SXX	0.269096E+02	SYY	0.976088E+00	SXY	0.262545E+01
		50	SXX	0.269422E+02	SYY	0.985874E+00	SXY	0.331150E+01
		47	SXX	0.263542E+02	SYY	-0.974307E+00	SXY	0.330000E+01
133	NODE	49	SXX	0.204645E+02	SYY	-0.957448E+00	SXY	0.260346E+01
		52	SXX	0.210715E+02	SYY	0.106579E+01	SXY	0.256115E+01
		53	SXX	0.209504E+02	SYY	0.102946E+01	SXY	0.326936E+01
		50	SXX	0.203434E+02	SYY	-0.993773E+00	SXY	0.331164E+01
135	NODE	52	SXX	0.149134E+02	SYY	-0.781629E+00	SXY	0.261555E+01
		55	SXX	0.154737E+02	SYY	0.108606E+01	SXY	0.237863E+01
		56	SXX	0.147959E+02	SYY	0.882706E+00	SXY	0.303227E+01
		53	SXX	0.142356E+02	SYY	-0.984987E+00	SXY	0.326952E+01
137	NODE	55	SXX	0.870135E+01	SYY	-0.945653E+00	SXY	0.280495E+01
		58	SXX	0.889630E+01	SYY	-0.295828E+00	SXY	0.309848E+01
		59	SXX	0.973487E+01	SYY	-0.442562E-01	SXY	0.332597E+01
		56	SXX	0.953993E+01	SYY	-0.694081E+00	SXY	0.303229E+01
139	NODE	58	SXX	-0.983157E-01	SYY	-0.299421E+01	SXY	0.636971E+00
		61	SXX	0.220663E+01	SYY	0.468894E+01	SXY	0.268724E+01
		62	SXX	0.806417E+01	SYY	0.644621E+01	SXY	0.537626E+01
		59	SXX	0.575923E+01	SYY	-0.123695E+01	SXY	0.332602E+01
102	NODE	2	SXX	0.120041E+03	SYY	0.360124E+02	SXY	0.175259E-04

/-ELEMENT-//----------/

		5	SXX	0.107808E+03	SYY	-0.476553E+01	SXY	0.543505E+00
		6	SXX	0.109361E+03	SYY	-0.429970E+01	SXY	-0.137288E+02
		3	SXX	0.121594E+03	SYY	0.364783E+02	SXY	-0.142723E+02
104	NODE	5	SXX	0.114686E+03	SYY	-0.270221E+01	SXY	0.543505E+00
		8	SXX	0.116104E+03	SYY	0.202592E+01	SXY	-0.367679E+01
		9	SXX	0.104046E+03	SYY	-0.159148E+01	SXY	-0.202194E+01
		6	SXX	0.102628E+03	SYY	-0.631961E+01	SXY	0.219836E+01
106	NODE	8	SXX	0.102541E+03	SYY	-0.204298E+01	SXY	-0.367679E+01
		11	SXX	0.103467E+03	SYY	0.104211E+01	SXY	-0.333772E+01
		12	SXX	0.104436E+03	SYY	0.133273E+01	SXY	-0.225795E+01
		9	SXX	0.103510E+03	SYY	-0.175237E+01	SXY	-0.259702E+01
108	NODE	11	SXX	0.973180E+02	SYY	-0.802505E+00	SXY	-0.333773E+01
		14	SXX	0.978423E+02	SYY	0.945038E+00	SXY	-0.328763E+01
		15	SXX	0.979854E+02	SYY	0.987976E+00	SXY	-0.267598E+01
		12	SXX	0.974612E+02	SYY	-0.759567E+00	SXY	-0.272608E+01
110	NODE	14	SXX	0.914447E+02	SYY	-0.974243E+00	SXY	-0.328762E+01
		17	SXX	0.920296E+02	SYY	0.975616E+00	SXY	-0.329812E+01
		18	SXX	0.919992E+02	SYY	0.966476E+00	SXY	-0.261565E+01
		15	SXX	0.914142E+02	SYY	-0.983383E+00	SXY	-0.260517E+01
112	NODE	17	SXX	0.855204E+02	SYY	-0.977127E+00	SXY	-0.329812E+01
		20	SXX	0.861066E+02	SYY	0.976730E+00	SXY	-0.330104E+01
		21	SXX	0.860973E+02	SYY	0.973938E+00	SXY	-0.261718E+01
		18	SXX	0.855112E+02	SYY	-0.979919E+00	SXY	-0.261423E+01
114	NODE	20	SXX	0.795965E+02	SYY	-0.976318E+00	SXY	-0.330104E+01
		23	SXX	0.801820E+02	SYY	0.975510E+00	SXY	-0.330014E+01
		24	SXX	0.801841E+02	SYY	0.976151E+00	SXY	-0.261698E+01
		21	SXX	0.795986E+02	SYY	-0.975677E+00	SXY	-0.261780E+01
116	NODE	23	SXX	0.736803E+02	SYY	-0.975021E+00	SXY	-0.330014E+01
		26	SXX	0.742654E+02	SYY	0.975494E+00	SXY	-0.330017E+01
		27	SXX	0.742648E+02	SYY	0.975327E+00	SXY	-0.261747E+01
		24	SXX	0.736797E+02	SYY	-0.975189E+00	SXY	-0.261733E+01
118	NODE	26	SXX	0.677625E+02	SYY	-0.975388E+00	SXY	-0.330017E+01
		29	SXX	0.683477E+02	SYY	0.975586E+00	SXY	-0.330024E+01
		30	SXX	0.683470E+02	SYY	0.975357E+00	SXY	-0.261740E+01
		27	SXX	0.677617E+02	SYY	-0.975616E+00	SXY	-0.261718E+01
120	NODE	29	SXX	0.618445E+02	SYY	-0.975388E+00	SXY	-0.330024E+01
		32	SXX	0.624298E+02	SYY	0.975525E+00	SXY	-0.330024E+01
		33	SXX	0.624292E+02	SYY	0.975342E+00	SXY	-0.261742E+01

/-ELEMENT-//----------/

		30	SXX	0.618439E+02	SYY	-0.975571E+00	SXY	-0.261738E+01
122	NODE	32	SXX	0.559267E+02	SYY	-0.975403E+00	SXY	-0.330024E+01
		35	SXX	0.565119E+02	SYY	0.975510E+00	SXY	-0.330017E+01
		36	SXX	0.565117E+02	SYY	0.975433E+00	SXY	-0.261735E+01
		33	SXX	0.559264E+02	SYY	-0.975479E+00	SXY	-0.261733E+01
124	NODE	35	SXX	0.500091E+02	SYY	-0.975357E+00	SXY	-0.330017E+01
		38	SXX	0.505944E+02	SYY	0.975567E+00	SXY	-0.330024E+01
		39	SXX	0.505935E+02	SYY	0.975307E+00	SXY	-0.261742E+01
		36	SXX	0.500082E+02	SYY	-0.975616E+00	SXY	-0.261720E+01
126	NODE	38	SXX	0.440911E+02	SYY	-0.975403E+00	SXY	-0.330024E+01
		41	SXX	0.446764E+02	SYY	0.975581E+00	SXY	-0.330020E+01
		42	SXX	0.446757E+02	SYY	0.975383E+00	SXY	-0.261737E+01
		39	SXX	0.440904E+02	SYY	-0.975601E+00	SXY	-0.261738E+01
128	NODE	41	SXX	0.381729E+02	SYY	-0.975452E+00	SXY	-0.330020E+01
		44	SXX	0.387583E+02	SYY	0.975899E+00	SXY	-0.329997E+01
		45	SXX	0.387587E+02	SYY	0.976016E+00	SXY	-0.261701E+01
		42	SXX	0.381733E+02	SYY	-0.975335E+00	SXY	-0.261714E+01
130	NODE	44	SXX	0.322556E+02	SYY	-0.974936E+00	SXY	-0.329980E+01
		47	SXX	0.328394E+02	SYY	0.971257E+00	SXY	-0.329967E+01
		48	SXX	0.328401E+02	SYY	0.971456E+00	SXY	-0.261851E+01
		45	SXX	0.322562E+02	SYY	-0.974738E+00	SXY	-0.261867E+01
132	NODE	47	SXX	0.263545E+02	SYY	-0.974222E+00	SXY	-0.329950E+01
		50	SXX	0.269425E+02	SYY	0.985959E+00	SXY	-0.331129E+01
		51	SXX	0.269087E+02	SYY	0.975798E+00	SXY	-0.262524E+01
		48	SXX	0.263206E+02	SYY	-0.984384E+00	SXY	-0.261362E+01
134	NODE	50	SXX	0.203438E+02	SYY	-0.993660E+00	SXY	-0.331112E+01
		53	SXX	0.209508E+02	SYY	0.102957E+01	SXY	-0.326911E+01
		54	SXX	0.210710E+02	SYY	0.106564E+01	SXY	-0.256100E+01
		51	SXX	0.204640E+02	SYY	-0.957594E+00	SXY	-0.260305E+01
136	NODE	53	SXX	0.142360E+02	SYY	-0.984874E+00	SXY	-0.326894E+01
		56	SXX	0.147963E+02	SYY	0.882815E+00	SXY	-0.303209E+01
		57	SXX	0.154729E+02	SYY	0.108580E+01	SXY	-0.237842E+01
		54	SXX	0.149126E+02	SYY	-0.781889E+00	SXY	-0.261533E+01
138	NODE	56	SXX	0.954040E+01	SYY	-0.693943E+00	SXY	-0.303209E+01
		59	SXX	0.973536E+01	SYY	-0.440931E-01	SXY	-0.332576E+01
		60	SXX	0.889563E+01	SYY	-0.296011E+00	SXY	-0.309834E+01
		57	SXX	0.870068E+01	SYY	-0.945861E+00	SXY	-0.280463E+01
140	NODE	59	SXX	0.575971E+01	SYY	-0.123679E+01	SXY	-0.332576E+01

/-ELEMENT-//----------/

		62	SXX 0.806465E+01	SYY 0.644633E+01	SXY -0.537610E+01
		63	SXX 0.220605E+01	SYY 0.468875E+01	SXY -0.268702E+01
		60	SXX -0.988858E-01	SYY -0.299436E+01	SXY -0.636531E+00
141	NODE	91	SXX -0.378012E+03	SYY -0.113404E+03	SXY -0.754250E+02
		92	SXX -0.352226E+03	SYY -0.274504E+02	SXY 0.176655E+02
		71	SXX -0.862536E+02	SYY 0.523415E+02	SXY 0.477492E+02
		70	SXX -0.112040E+03	SYY -0.336119E+02	SXY -0.453413E+02
142	NODE	92	SXX -0.332215E+03	SYY -0.214471E+02	SXY -0.429128E+02
		93	SXX -0.337407E+03	SYY -0.387541E+02	SXY 0.384219E+02
		72	SXX -0.105023E+03	SYY 0.309614E+02	SXY 0.323645E+02
		71	SXX -0.998307E+02	SYY 0.482684E+02	SXY -0.489701E+02
143	NODE	93	SXX -0.320732E+03	SYY -0.337516E+02	SXY -0.464573E+02
		94	SXX -0.321267E+03	SYY -0.355342E+02	SXY 0.332001E+02
		73	SXX -0.936744E+02	SYY 0.327437E+02	SXY 0.325762E+02
		72	SXX -0.931396E+02	SYY 0.345263E+02	SXY -0.470812E+02
144	NODE	94	SXX -0.302127E+03	SYY -0.297921E+02	SXY -0.439014E+02
		95	SXX -0.303514E+03	SYY -0.344150E+02	SXY 0.313790E+02
		74	SXX -0.884264E+02	SYY 0.301113E+02	SXY 0.297609E+02
		73	SXX -0.870396E+02	SYY 0.347342E+02	SXY -0.455195E+02
145	NODE	95	SXX -0.283685E+03	SYY -0.284662E+02	SXY -0.416347E+02
		96	SXX -0.284786E+03	SYY -0.321387E+02	SXY 0.289104E+02
		75	SXX -0.832283E+02	SYY 0.283288E+02	SXY 0.276252E+02
		74	SXX -0.821266E+02	SYY 0.320012E+02	SXY -0.429198E+02
146	NODE	96	SXX -0.265314E+03	SYY -0.262970E+02	SXY -0.393096E+02
		97	SXX -0.266500E+03	SYY -0.302482E+02	SXY 0.266940E+02
		76	SXX -0.779166E+02	SYY 0.263267E+02	SXY 0.253112E+02
		75	SXX -0.767312E+02	SYY 0.302779E+02	SXY -0.406925E+02
147	NODE	97	SXX -0.246990E+03	SYY -0.243952E+02	SXY -0.370486E+02
		98	SXX -0.248157E+03	SYY -0.282870E+02	SXY 0.244057E+02
		77	SXX -0.725727E+02	SYY 0.243884E+02	SXY 0.230438E+02
		76	SXX -0.714052E+02	SYY 0.282802E+02	SXY -0.384106E+02
148	NODE	98	SXX -0.228648E+03	SYY -0.224343E+02	SXY -0.347703E+02
		99	SXX -0.229820E+03	SYY -0.263383E+02	SXY 0.221325E+02
		78	SXX -0.672418E+02	SYY 0.224350E+02	SXY 0.207664E+02
		77	SXX -0.660706E+02	SYY 0.263390E+02	SXY -0.361355E+02
149	NODE	99	SXX -0.210309E+03	SYY -0.204852E+02	SXY -0.324957E+02
		100	SXX -0.211482E+03	SYY -0.243933E+02	SXY 0.198551E+02
		79	SXX -0.619109E+02	SYY 0.204780E+02	SXY 0.184902E+02

/-ELEMENT-//----------/

		78	SXX -0.607385E+02	SYY 0.243860E+02	SXY -0.338594E+02
150	NODE	100	SXX -0.191973E+03	SYY -0.185407E+02	SXY -0.302200E+02
		101	SXX -0.193143E+03	SYY -0.224415E+02	SXY 0.175770E+02
		80	SXX -0.565782E+02	SYY 0.185281E+02	SXY 0.162163E+02
		79	SXX -0.554079E+02	SYY 0.224289E+02	SXY -0.315820E+02
151	NODE	101	SXX -0.173635E+03	SYY -0.165889E+02	SXY -0.279420E+02
		102	SXX -0.174806E+03	SYY -0.204927E+02	SXY 0.153020E+02
		81	SXX -0.512465E+02	SYY 0.165750E+02	SXY 0.139387E+02
		80	SXX -0.500754E+02	SYY 0.204789E+02	SXY -0.293056E+02
152	NODE	102	SXX -0.155296E+03	SYY -0.146397E+02	SXY -0.256667E+02
		103	SXX -0.156465E+03	SYY -0.185374E+02	SXY 0.130249E+02
		82	SXX -0.459124E+02	SYY 0.146284E+02	SXY 0.116621E+02
		81	SXX -0.447431E+02	SYY 0.185261E+02	SXY -0.270303E+02
153	NODE	103	SXX -0.136956E+03	SYY -0.126848E+02	SXY -0.233924E+02
		104	SXX -0.138127E+03	SYY -0.165872E+02	SXY 0.107504E+02
		83	SXX -0.405799E+02	SYY 0.126769E+02	SXY 0.938611E+01
		82	SXX -0.394092E+02	SYY 0.165793E+02	SXY -0.247538E+02
154	NODE	104	SXX -0.118618E+03	SYY -0.107345E+02	SXY -0.211162E+02
		105	SXX -0.119789E+03	SYY -0.146369E+02	SXY 0.847358E+01
		84	SXX -0.352475E+02	SYY 0.107256E+02	SXY 0.711172E+01
		83	SXX -0.340768E+02	SYY 0.146279E+02	SXY -0.224778E+02
155	NODE	105	SXX -0.100274E+03	SYY -0.878244E+01	SXY -0.188359E+02
		106	SXX -0.101446E+03	SYY -0.126894E+02	SXY 0.619609E+01
		85	SXX -0.299196E+02	SYY 0.876860E+01	SXY 0.482926E+01
		84	SXX -0.287475E+02	SYY 0.126756E+02	SXY -0.202038E+02
156	NODE	106	SXX -0.819333E+02	SYY -0.683551E+01	SXY -0.165715E+02
		107	SXX -0.830902E+02	SYY -0.106918E+02	SXY 0.390699E+01
		86	SXX -0.245861E+02	SYY 0.685942E+01	SXY 0.255917E+01
		85	SXX -0.234292E+02	SYY 0.107157E+02	SXY -0.179179E+02
157	NODE	107	SXX -0.636503E+02	SYY -0.485982E+01	SXY -0.142034E+02
		108	SXX -0.649320E+02	SYY -0.913213E+01	SXY 0.179630E+01
		87	SXX -0.192196E+02	SYY 0.458158E+01	SXY 0.303575E+00
		86	SXX -0.179379E+02	SYY 0.885389E+01	SXY -0.156964E+02
158	NODE	108	SXX -0.456970E+02	SYY -0.336164E+01	SXY -0.124905E+02
		109	SXX -0.462276E+02	SYY -0.513013E+01	SXY -0.101724E+01
		88	SXX -0.134462E+02	SYY 0.470428E+01	SXY -0.163447E+01
		87	SXX -0.129156E+02	SYY 0.647277E+01	SXY -0.131088E+02
159	NODE	109	SXX -0.213320E+02	SYY 0.233853E+01	SXY -0.909171E+01

PAGE - 34

/-ELEMENT-//----------/

		110	SXX -0.235960E+02	SYY -0.520825E+01	SXY -0.571131E+01
		89	SXX -0.139430E+02	SYY -0.231235E+01	SXY -0.834966E+01
		88	SXX -0.116790E+02	SYY 0.523443E+01	SXY -0.117272E+02
160	NODE	110	SXX -0.480403E+01	SYY 0.429351E+00	SXY -0.414676E+01
		111	SXX -0.755117E+01	SYY -0.872780E+01	SXY -0.318861E+01
		90	SXX -0.480748E+01	SYY -0.790469E+01	SXY -0.639066E+01
		89	SXX -0.206034E+01	SYY 0.125246E+01	SXY -0.735273E+01
161	NODE	70	SXX -0.112040E+03	SYY -0.336119E+02	SXY -0.453413E+02
		71	SXX -0.114580E+03	SYY -0.420800E+02	SXY 0.358870E+02
		5	SXX 0.117501E+03	SYY 0.275442E+02	SXY 0.329232E+02
		2	SXX 0.120041E+03	SYY 0.360124E+02	SXY -0.483051E+02
162	NODE	71	SXX -0.128157E+03	SYY -0.461532E+02	SXY -0.608323E+02
		72	SXX -0.124605E+03	SYY -0.343111E+02	SXY 0.275553E+02
		8	SXX 0.127931E+03	SYY 0.414496E+02	SXY 0.317000E+02
		5	SXX 0.124379E+03	SYY 0.296076E+02	SXY -0.566876E+02
163	NODE	72	SXX -0.112721E+03	SYY -0.307462E+02	SXY -0.518906E+02
		73	SXX -0.113915E+03	SYY -0.347260E+02	SXY 0.275909E+02
		11	SXX 0.113174E+03	SYY 0.334009E+02	SXY 0.261981E+02
		8	SXX 0.114368E+03	SYY 0.373807E+02	SXY -0.532832E+02
164	NODE	73	SXX -0.107280E+03	SYY -0.327355E+02	SXY -0.505049E+02
		74	SXX -0.107080E+03	SYY -0.320668E+02	SXY 0.245020E+02
		14	SXX 0.107226E+03	SYY 0.322250E+02	SXY 0.247362E+02
		11	SXX 0.107026E+03	SYY 0.315563E+02	SXY -0.502710E+02
165	NODE	74	SXX -0.100780E+03	SYY -0.301770E+02	SXY -0.481787E+02
		75	SXX -0.100804E+03	SYY -0.302569E+02	SXY 0.223846E+02
		17	SXX 0.100804E+03	SYY 0.302257E+02	SXY 0.223565E+02
		14	SXX 0.100828E+03	SYY 0.303056E+02	SXY -0.482066E+02
166	NODE	75	SXX -0.943076E+02	SYY -0.283079E+02	SXY -0.459333E+02
		76	SXX -0.943008E+02	SYY -0.282850E+02	SXY 0.200774E+02
		20	SXX 0.943016E+02	SYY 0.282957E+02	SXY 0.200854E+02
		17	SXX 0.942948E+02	SYY 0.282728E+02	SXY -0.459252E+02
167	NODE	76	SXX -0.877891E+02	SYY -0.263315E+02	SXY -0.436443E+02
		77	SXX -0.877913E+02	SYY -0.263389E+02	SXY 0.178089E+02
		23	SXX 0.877892E+02	SYY 0.263353E+02	SXY 0.178063E+02
		20	SXX 0.877915E+02	SYY 0.263427E+02	SXY -0.436470E+02
168	NODE	77	SXX -0.812891E+02	SYY -0.243882E+02	SXY -0.413704E+02
		78	SXX -0.812887E+02	SYY -0.243870E+02	SXY 0.155315E+02
		26	SXX 0.812879E+02	SYY 0.243859E+02	SXY 0.155319E+02

/-ELEMENT-//----------/

		23	SXX 0.812876E+02	SYY 0.243848E+02	SXY -0.413698E+02
169	NODE	78	SXX -0.747856E+02	SYY -0.224361E+02	SXY -0.390967E+02
		79	SXX -0.747860E+02	SYY -0.224372E+02	SXY 0.132553E+02
		29	SXX 0.747848E+02	SYY 0.224340E+02	SXY 0.132554E+02
		26	SXX 0.747851E+02	SYY 0.224351E+02	SXY -0.390936E+02
170	NODE	79	SXX -0.682832E+02	SYY -0.204863E+02	SXY -0.368188E+02
		80	SXX -0.682836E+02	SYY -0.204879E+02	SXY 0.109788E+02
		32	SXX 0.682812E+02	SYY 0.204816E+02	SXY 0.109803E+02
		29	SXX 0.682817E+02	SYY 0.204831E+02	SXY -0.368173E+02
171	NODE	80	SXX -0.617806E+02	SYY -0.185370E+02	SXY -0.345425E+02
		81	SXX -0.617820E+02	SYY -0.185416E+02	SXY 0.870257E+01
		35	SXX 0.617766E+02	SYY 0.185260E+02	SXY 0.870535E+01
		32	SXX 0.617780E+02	SYY 0.185306E+02	SXY -0.345416E+02
172	NODE	81	SXX -0.552786E+02	SYY -0.165905E+02	SXY -0.322675E+02
		82	SXX -0.552781E+02	SYY -0.165890E+02	SXY 0.642454E+01
		38	SXX 0.552741E+02	SYY 0.165766E+02	SXY 0.642881E+01
		35	SXX 0.552736E+02	SYY 0.165751E+02	SXY -0.322655E+02
173	NODE	82	SXX -0.487752E+02	SYY -0.146382E+02	SXY -0.299920E+02
		83	SXX -0.487739E+02	SYY -0.146336E+02	SXY 0.414890E+01
		41	SXX 0.487723E+02	SYY 0.146303E+02	SXY 0.415280E+01
		38	SXX 0.487709E+02	SYY 0.146257E+02	SXY -0.299894E+02
174	NODE	83	SXX -0.422707E+02	SYY -0.126826E+02	SXY -0.277144E+02
		84	SXX -0.422721E+02	SYY -0.126872E+02	SXY 0.187471E+01
		44	SXX 0.422676E+02	SYY 0.126747E+02	SXY 0.187572E+01
		41	SXX 0.422690E+02	SYY 0.126793E+02	SXY -0.277123E+02
175	NODE	84	SXX -0.357722E+02	SYY -0.107372E+02	SXY -0.254418E+02
		85	SXX -0.357680E+02	SYY -0.107234E+02	SXY -0.403782E+00
		47	SXX 0.357692E+02	SYY 0.107377E+02	SXY -0.395454E+00
		44	SXX 0.357650E+02	SYY 0.107239E+02	SXY -0.254328E+02
176	NODE	85	SXX -0.292773E+02	SYY -0.877622E+01	SXY -0.231519E+02
		86	SXX -0.292981E+02	SYY -0.884530E+01	SXY -0.265504E+01
		50	SXX 0.292634E+02	SYY 0.872315E+01	SXY -0.267576E+01
		47	SXX 0.292841E+02	SYY 0.879223E+01	SXY -0.231709E+02
177	NODE	86	SXX -0.226497E+02	SYY -0.685080E+01	SXY -0.209107E+02
		87	SXX -0.226253E+02	SYY -0.676944E+01	SXY -0.505140E+01
		53	SXX 0.226890E+02	SYY 0.682487E+01	SXY -0.502108E+01
		50	SXX 0.226646E+02	SYY 0.674350E+01	SXY -0.208796E+02
178	NODE	87	SXX -0.163214E+02	SYY -0.487827E+01	SXY -0.184611E+02

PAGE - 36

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/-ELEMENT-//-------------------------------------------------------------------------------------------------------------/

                 88          SXX -0.162560E+02   SYY -0.466028E+01   SXY -0.715746E+01
                 56          SXX  0.160396E+02   SYY  0.502841E+01   SXY -0.707787E+01
                 53          SXX  0.159742E+02   SYY  0.481042E+01   SXY -0.183796E+02

 179      NODE   88          SXX -0.144889E+02   SYY -0.413014E+01   SXY -0.172491E+02
                 89          SXX -0.123944E+02   SYY  0.285171E+01   SXY -0.840581E+01
                 59          SXX  0.128782E+02   SYY  0.104335E+02   SXY -0.596136E+01
                 56          SXX  0.107836E+02   SYY  0.345162E+01   SXY -0.148066E+02

 180      NODE   89          SXX -0.511645E+00   SYY  0.641652E+01   SXY -0.740676E+01
                 90          SXX -0.152269E+02   SYY -0.426344E+02   SXY -0.411146E+01
                 62          SXX -0.581275E+01   SYY -0.398102E+02   SXY -0.212787E+02
                 59          SXX  0.890254E+01   SYY  0.924077E+01   SXY -0.245720E+02
```

LOADING - 1 POINT LOAD AT END OF BEAM

MEMBER FORCES LOADING - 1

MEMBER	JOINT	FORCE AXIAL	FORCE SHEAR Y	FORCE SHEAR Z	MOMENT TORSIONAL	MOMENT BENDING Y	MOMENT BENDING Z

SUPPORT JOINT REACTION LOADS LOADING - 1

JOINT		FORCE X FORCE	FORCE Y FORCE	FORCE Z FORCE	MOMENT X MOMENT	MOMENT Y MOMENT	MOMENT Z MOMENT
1	GLOBAL	-304.561035	-73.7928162	-1.1070356	2.2288208	-9.2251549	
2	GLOBAL	-656.939941	-0.0000872	13.4447203	0.0000037	-22.4665375	0.0000261
3	GLOBAL	-304.560791	73.7927246	-1.1068220	-2.2289257	-9.2256241	
70	GLOBAL	540.312256	0.0000729	-57.9682770	0.0000026		0.0004210
91	GLOBAL	725.749756	0.0000990	146.736496	-0.0000809		0.0003781

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
1	GLOBAL	0.0	0.0	0.0	0.0	0.0	
2	GLOBAL	0.0	0.0	0.0	0.0	0.0	0.0
3	GLOBAL	0.0	0.0	0.0	0.0	0.0	
70	GLOBAL	0.0	0.0	0.0	0.0		0.0
91	GLOBAL	0.0	0.0	0.0	0.0		0.0

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
4	GLOBAL	0.0000184	0.0000062	-0.0000175	-0.0000017	0.0000075	
7	GLOBAL	0.0000359	0.0000055	-0.0000757	-0.0000020	0.0000156	
10	GLOBAL	0.0000532	0.0000050	-0.0001720	-0.0000021	0.0000228	
13	GLOBAL	0.0000695	0.0000047	-0.0003022	-0.0000019	0.0000292	

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		/----------DISPLACEMENT----------//			----------ROTATION----------/		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
16	GLOBAL	0.0000848	0.0000044	-0.0004639	-0.0000018	0.0000354	
19	GLOBAL	0.0000991	0.0000041	-0.0006551	-0.0000017	0.0000411	
22	GLOBAL	0.0001124	0.0000038	-0.0008740	-0.0000015	0.0000464	
25	GLOBAL	0.0001247	0.0000036	-0.0011184	-0.0000014	0.0000513	
28	GLOBAL	0.0001361	0.0000033	-0.0013866	-0.0000013	0.0000559	
31	GLOBAL	0.0001464	0.0000030	-0.0016764	-0.0000012	0.0000600	
34	GLOBAL	0.0001558	0.0000027	-0.0019860	-0.0000011	0.0000638	
37	GLOBAL	0.0001642	0.0000024	-0.0023133	-0.0000009	0.0000671	
40	GLOBAL	0.0001716	0.0000021	-0.0026565	-0.0000008	0.0000701	
43	GLOBAL	0.0001780	0.0000018	-0.0030134	-0.0000007	0.0000726	
46	GLOBAL	0.0001834	0.0000015	-0.0033821	-0.0000006	0.0000748	
49	GLOBAL	0.0001878	0.0000012	-0.0037608	-0.0000005	0.0000766	
52	GLOBAL	0.0001913	0.0000009	-0.0041472	-0.0000004	0.0000779	
55	GLOBAL	0.0001938	0.0000006	-0.0045389	-0.0000004	0.0000788	
58	GLOBAL	0.0001953	0.0000005	-0.0049354	-0.0000002	0.0000799	
61	GLOBAL	0.0001954	-0.0000007	-0.0053371	-0.0000005	0.0000806	
5	GLOBAL	0.0000182	0.0000000	-0.0000209	-0.0000000	0.0000081	-0.0000000
8	GLOBAL	0.0000375	0.0000000	-0.0000807	-0.0000000	0.0000158	0.0000000
11	GLOBAL	0.0000546	0.0000000	-0.0001773	-0.0000000	0.0000227	0.0000000
14	GLOBAL	0.0000709	0.0000000	-0.0003070	-0.0000000	0.0000292	0.0000000
17	GLOBAL	0.0000862	0.0000000	-0.0004683	-0.0000000	0.0000353	0.0000000
20	GLOBAL	0.0001005	0.0000000	-0.0006593	-0.0000000	0.0000410	0.0000000
23	GLOBAL	0.0001138	0.0000000	-0.0008778	-0.0000000	0.0000463	0.0000000
26	GLOBAL	0.0001261	0.0000000	-0.0011220	-0.0000000	0.0000513	0.0000000
29	GLOBAL	0.0001375	0.0000000	-0.0013899	-0.0000000	0.0000558	0.0000000
32	GLOBAL	0.0001478	0.0000000	-0.0016794	-0.0000000	0.0000599	-0.0000000
35	GLOBAL	0.0001572	0.0000000	-0.0019887	-0.0000000	0.0000637	-0.0000000
38	GLOBAL	0.0001656	0.0000000	-0.0023157	-0.0000000	0.0000671	-0.0000000
41	GLOBAL	0.0001730	0.0000000	-0.0026585	-0.0000000	0.0000700	-0.0000000
44	GLOBAL	0.0001794	0.0000000	-0.0030152	-0.0000000	0.0000726	-0.0000000
47	GLOBAL	0.0001848	0.0000000	-0.0033836	-0.0000000	0.0000747	-0.0000000
50	GLOBAL	0.0001893	0.0000000	-0.0037619	-0.0000000	0.0000765	-0.0000000
53	GLOBAL	0.0001927	0.0000000	-0.0041482	-0.0000000	0.0000779	-0.0000000
56	GLOBAL	0.0001951	0.0000000	-0.0045402	-0.0000000	0.0000787	-0.0000000
59	GLOBAL	0.0001968	-0.0000000	-0.0049355	-0.0000000	0.0000799	-0.0000000
62	GLOBAL	0.0001978	-0.0000000	-0.0053389	-0.0000000	0.0000811	0.0000000
6	GLOBAL	0.0000184	-0.0000062	-0.0000175	0.0000017	0.0000075	
9	GLOBAL	0.0000359	-0.0000055	-0.0000757	0.0000020	0.0000156	
12	GLOBAL	0.0000532	-0.0000050	-0.0001720	0.0000021	0.0000228	
15	GLOBAL	0.0000695	-0.0000047	-0.0003023	0.0000019	0.0000292	
18	GLOBAL	0.0000848	-0.0000044	-0.0004639	0.0000018	0.0000354	
21	GLOBAL	0.0000991	-0.0000041	-0.0006551	0.0000017	0.0000411	
24	GLOBAL	0.0001124	-0.0000038	-0.0008740	0.0000015	0.0000464	
27	GLOBAL	0.0001247	-0.0000036	-0.0011184	0.0000014	0.0000513	

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
30	GLOBAL	0.0001361	-0.0000033	-0.0013866	0.0000013	0.0000559	
33	GLOBAL	0.0001464	-0.0000030	-0.0016765	0.0000012	0.0000600	
36	GLOBAL	0.0001558	-0.0000027	-0.0019860	0.0000011	0.0000638	
39	GLOBAL	0.0001642	-0.0000024	-0.0023134	0.0000009	0.0000671	
42	GLOBAL	0.0001716	-0.0000021	-0.0026565	0.0000008	0.0000701	
45	GLOBAL	0.0001780	-0.0000018	-0.0030134	0.0000007	0.0000726	
48	GLOBAL	0.0001834	-0.0000015	-0.0033821	0.0000006	0.0000748	
51	GLOBAL	0.0001878	-0.0000012	-0.0037608	0.0000005	0.0000766	
54	GLOBAL	0.0001913	-0.0000009	-0.0041472	0.0000004	0.0000779	
57	GLOBAL	0.0001938	-0.0000006	-0.0045389	0.0000004	0.0000788	
60	GLOBAL	0.0001953	-0.0000005	-0.0049354	0.0000002	0.0000799	
63	GLOBAL	0.0001954	0.0000007	-0.0053372	0.0000005	0.0000806	
71	GLOBAL	-0.0000170	-0.0000000	-0.0000196	-0.0000000		-0.0000000
72	GLOBAL	-0.0000360	-0.0000000	-0.0000812	-0.0000000		-0.0000000
73	GLOBAL	-0.0000533	-0.0000000	-0.0001772	-0.0000000		-0.0000000
74	GLOBAL	-0.0000695	-0.0000000	-0.0003070	-0.0000000		-0.0000000
75	GLOBAL	-0.0000848	-0.0000000	-0.0004683	-0.0000000		-0.0000000
76	GLOBAL	-0.0000991	-0.0000000	-0.0006593	-0.0000000		-0.0000000
77	GLOBAL	-0.0001124	-0.0000000	-0.0008778	-0.0000000		-0.0000000
78	GLOBAL	-0.0001248	-0.0000000	-0.0011220	-0.0000000		-0.0000000
79	GLOBAL	-0.0001361	-0.0000000	-0.0013899	-0.0000000		-0.0000000
80	GLOBAL	-0.0001465	-0.0000000	-0.0016794	-0.0000000		-0.0000000
81	GLOBAL	-0.0001558	-0.0000000	-0.0019887	-0.0000000		-0.0000000
82	GLOBAL	-0.0001642	-0.0000000	-0.0023157	-0.0000000		-0.0000000
83	GLOBAL	-0.0001716	-0.0000000	-0.0026585	-0.0000000		0.0000000
84	GLOBAL	-0.0001780	-0.0000000	-0.0030152	-0.0000000		0.0000000
85	GLOBAL	-0.0001835	-0.0000000	-0.0033836	-0.0000000		0.0000000
86	GLOBAL	-0.0001879	-0.0000000	-0.0037619	-0.0000000		0.0000000
87	GLOBAL	-0.0001913	-0.0000000	-0.0041482	-0.0000000		0.0000000
88	GLOBAL	-0.0001938	-0.0000000	-0.0045402	-0.0000000		0.0000000
89	GLOBAL	-0.0001960	-0.0000000	-0.0049366	-0.0000000		0.0000000
90	GLOBAL	-0.0001964	-0.0000000	-0.0053326	-0.0000000		0.0000000
92	GLOBAL	-0.0000573	-0.0000000	-0.0000327	-0.0000000		-0.0000000
93	GLOBAL	-0.0001116	-0.0000000	-0.0000916	-0.0000000		-0.0000000
94	GLOBAL	-0.0001634	-0.0000000	-0.0001873	-0.0000000		-0.0000000
95	GLOBAL	-0.0002123	-0.0000000	-0.0003165	-0.0000000		-0.0000000
96	GLOBAL	-0.0002581	-0.0000000	-0.0004772	-0.0000000		-0.0000000
97	GLOBAL	-0.0003010	-0.0000000	-0.0006676	-0.0000000		-0.0000000
98	GLOBAL	-0.0003410	-0.0000000	-0.0008855	-0.0000000		-0.0000000
99	GLOBAL	-0.0003780	-0.0000000	-0.0011291	-0.0000000		-0.0000000
100	GLOBAL	-0.0004120	-0.0000000	-0.0013964	-0.0000000		-0.0000000
101	GLOBAL	-0.0004431	-0.0000000	-0.0016853	-0.0000000		-0.0000000
102	GLOBAL	-0.0004712	-0.0000000	-0.0019940	-0.0000000		-0.0000000
103	GLOBAL	-0.0004963	-0.0000000	-0.0023205	-0.0000000		-0.0000000

PAGE - 40

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
104	GLOBAL	-0.0005185	-0.0000000	-0.0026627	-0.0000000		0.0000000
105	GLOBAL	-0.0005377	-0.0000000	-0.0030187	-0.0000000		0.0000000
106	GLOBAL	-0.0005540	-0.0000000	-0.0033866	-0.0000000		0.0000000
107	GLOBAL	-0.0005673	-0.0000000	-0.0037643	-0.0000000		0.0000000
108	GLOBAL	-0.0005777	-0.0000000	-0.0041499	-0.0000000		0.0000000
109	GLOBAL	-0.0005851	-0.0000000	-0.0045417	-0.0000000		0.0000000
110	GLOBAL	-0.0005888	-0.0000000	-0.0049369	-0.0000000		0.0000000
111	GLOBAL	-0.0005896	-0.0000000	-0.0053315	-0.0000000		0.0000000

PAGE - 41

EXECUTE PROGRAM 'QQSTJTAV'

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*RESULTS OF LATEST ANALYSIS*
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PROBLEM - BEAM TITLE - T BEAM WITH SHELL ELEMENTS

ACTIVE UNITS INCH LB RAD FAHR SEC LBM

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------
1	1	0.329303E+01	0.987910E+00	0.400002E+00	0.273968E-01	0.319454E+00
4	1	0.438217E+01	-0.831261E-01	0.429809E+00	-0.100368E-01	0.960817E-01
7	1	0.382211E+01	0.448384E-01	0.599979E-01	-0.678014E-01	0.200789E-01
10	1	0.334921E+01	0.360298E-02	-0.323132E-01	-0.644074E-01	-0.403085E-01
13	1	0.313046E+01	-0.658607E-02	-0.607957E-01	-0.334468E-01	0.123565E-01
16	1	0.296104E+01	0.773937E-03	-0.458941E-01	-0.282420E-01	-0.282956E-02
19	1	0.276066E+01	-0.260502E-03	-0.459280E-01	-0.301834E-01	0.620775E-03
22	1	0.256465E+01	0.115395E-03	-0.453735E-01	-0.302326E-01	-0.204626E-03
25	1	0.236713E+01	0.327826E-06	-0.454687E-01	-0.303640E-01	-0.108540E-04
28	1	0.216988E+01	-0.177622E-04	-0.454881E-01	-0.303612E-01	-0.600066E-04
31	1	0.197259E+01	-0.728667E-04	-0.454950E-01	-0.303840E-01	-0.603464E-04
34	1	0.177523E+01	-0.265479E-03	-0.454976E-01	-0.303613E-01	0.440755E-04
37	1	0.157807E+01	-0.169486E-03	-0.455255E-01	-0.303360E-01	-0.568883E-04
40	1	0.138074E+01	-0.264376E-03	-0.455874E-01	-0.302492E-01	0.572481E-04
43	1	0.118446E+01	0.298619E-04	-0.461900E-01	-0.303109E-01	-0.327058E-03
46	1	0.987269E+00	-0.835359E-04	-0.461587E-01	-0.314135E-01	0.992167E-03
49	1	0.788257E+00	0.107169E-03	-0.430388E-01	-0.378040E-01	-0.226578E-02

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
52	1	0.499425E+00	-0.167505E-01	-0.226653E-02	-0.223714E-01	0.245437E-01
55	1	0.444532E+00	0.371380E-01	-0.535769E-01	-0.504516E-03	-0.139788E+00
58	1	0.630078E+00	-0.576113E-01	0.934441E-02	-0.327517E-01	0.195404E+00
61	1	0.125290E+00	0.620238E-01	0.189253E+00	-0.659810E-01	-0.138232E+00
2	1	0.326021E+01	0.978061E+00	0.638048E-06	-0.163466E+00	0.219996E-04
5	1	0.269130E+01	0.591091E+00	0.410045E-04	-0.135561E+00	0.261417E-05
8	1	0.253256E+01	0.132430E+00	0.476195E-04	-0.973145E-01	0.404149E-06
11	1	0.213712E+01	-0.765662E-01	0.495961E-04	-0.358600E-01	-0.441893E-05
14	1	0.213319E+01	0.288989E-02	0.432299E-04	-0.531516E-02	0.211039E-04
17	1	0.196575E+01	-0.338273E-02	0.356108E-04	-0.223754E-01	-0.254492E-04
20	1	0.184238E+01	0.579520E-03	0.299932E-04	-0.197512E-01	0.698006E-05
23	1	0.170918E+01	-0.158051E-03	0.209407E-04	-0.204123E-01	-0.190149E-04
26	1	0.157816E+01	-0.375908E-04	0.200731E-04	-0.202485E-01	-0.227632E-04
29	1	0.144653E+01	-0.145009E-03	0.647185E-05	-0.202942E-01	-0.854200E-05
32	1	0.131499E+01	-0.137083E-03	0.787076E-05	-0.202648E-01	-0.330743E-04
35	1	0.118359E+01	-0.877170E-04	-0.339055E-06	-0.202832E-01	0.923003E-05
38	1	0.105196E+01	-0.195937E-03	-0.119410E-04	-0.202888E-01	-0.131405E-04
41	1	0.920672E+00	-0.775736E-04	-0.254996E-04	-0.203279E-01	-0.757832E-05
44	1	0.788388E+00	-0.396259E-04	-0.374280E-04	-0.198532E-01	-0.176605E-04
47	1	0.659796E+00	0.274389E-02	-0.443099E-04	-0.202804E-01	-0.366192E-04
50	1	0.517273E+00	-0.143883E-02	-0.799396E-04	-0.184727E-01	0.363497E-04
53	1	0.439071E+00	-0.103119E-01	-0.709568E-04	-0.623105E-01	-0.308167E-03

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------
56	1	-0.539202E-01	-0.230735E+00	-0.120644E-03	0.664801E-01	0.152513E-03
59	1	0.898588E+00	0.330608E+00	-0.232275E-03	-0.759021E-02	-0.311047E-03
62	1	-0.831330E-01	-0.388460E+00	-0.162212E-03	-0.257068E+00	-0.883399E-03
3	1	0.329327E+01	0.987982E+00	-0.400005E+00	0.273460E-01	-0.319406E+00
6	1	0.438219E+01	-0.831385E-01	-0.429724E+00	-0.100692E-01	-0.960830E-01
9	1	0.382212E+01	0.448370E-01	-0.599017E-01	-0.678185E-01	-0.200813E-01
12	1	0.334916E+01	0.358105E-02	0.324118E-01	-0.644009E-01	0.402937E-01
15	1	0.313058E+01	-0.648212E-02	0.608777E-01	-0.334949E-01	-0.122941E-01
18	1	0.296093E+01	0.625581E-03	0.459566E-01	-0.283269E-01	0.275239E-02
21	1	0.276076E+01	-0.229478E-03	0.459776E-01	-0.302979E-01	-0.600738E-03
24	1	0.256457E+01	-0.885129E-05	0.454006E-01	-0.304011E-01	0.146565E-03
27	1	0.236705E+01	-0.151873E-03	0.454985E-01	-0.304947E-01	-0.585641E-04
30	1	0.216993E+01	-0.747442E-04	0.454828E-01	-0.305229E-01	0.331493E-04
33	1	0.197240E+01	-0.264049E-03	0.455001E-01	-0.305166E-01	-0.402015E-04
36	1	0.177532E+01	-0.223309E-03	0.454847E-01	-0.304902E-01	-0.177949E-04
39	1	0.157806E+01	-0.230551E-03	0.454850E-01	-0.305457E-01	0.159709E-04
42	1	0.138070E+01	-0.337839E-03	0.455136E-01	-0.304778E-01	-0.815814E-04
45	1	0.118449E+01	-0.845492E-04	0.460880E-01	-0.305995E-01	0.272325E-03
48	1	0.987088E+00	-0.320703E-03	0.460440E-01	-0.316926E-01	-0.110407E-02
51	1	0.789011E+00	0.236928E-03	0.428247E-01	-0.385140E-01	0.237225E-02
54	1	0.497312E+00	-0.188344E-01	0.208432E-02	-0.226537E-01	-0.254711E-01

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
57	1	0.446846E+00	0.377417E-01	0.532376E-01	-0.133461E-02	0.140244E+00
60	1	0.629036E+00	-0.600339E-01	-0.100268E-01	-0.348544E-01	-0.196325E+00
63	1	0.121309E+00	0.565284E-01	-0.189728E+00	-0.678924E-01	0.135589E+00
70	1	-0.857462E-04	-0.257239E-04	0.194479E-06	0.111765E-04	0.169630E-04
71	1	-0.264705E-04	-0.130850E-04	0.368173E-04	0.855441E-05	0.433532E-05
72	1	-0.351613E-05	0.191009E-05	0.483241E-04	0.377828E-05	0.256996E-05
73	1	0.336828E-05	0.585939E-05	0.500922E-04	0.111408E-05	0.119338E-05
74	1	0.597608E-05	0.736582E-05	0.480429E-04	0.470021E-06	0.881872E-06
75	1	0.733313E-05	0.821603E-05	0.445335E-04	0.322784E-06	0.830487E-06
76	1	0.842687E-05	0.910597E-05	0.403263E-04	0.310330E-06	0.908569E-06
77	1	0.944927E-05	0.100792E-04	0.355699E-04	0.308969E-06	0.101312E-05
78	1	0.104287E-04	0.110764E-04	0.302998E-04	0.298530E-06	0.111971E-05
79	1	0.113455E-04	0.120378E-04	0.245361E-04	0.279561E-06	0.121971E-05
80	1	0.121908E-04	0.129348E-04	0.183083E-04	0.256608E-06	0.131205E-05
81	1	0.129562E-04	0.137517E-04	0.116560E-04	0.229652E-06	0.139516E-05
82	1	0.136253E-04	0.144654E-04	0.463029E-05	0.193229E-06	0.147536E-05
83	1	0.141521E-04	0.150119E-04	-0.269048E-05	0.129741E-06	0.155827E-05
84	1	0.144179E-04	0.151849E-04	-0.101447E-04	-0.184612E-07	0.165362E-05
85	1	0.140868E-04	0.143623E-04	-0.173446E-04	-0.411376E-06	0.178939E-05
86	1	0.122924E-04	0.109790E-04	-0.233541E-04	-0.137369E-05	0.196682E-05
87	1	0.715253E-05	0.235075E-05	-0.262648E-04	-0.318163E-05	0.182405E-05
88	1	-0.525744E-05	-0.129129E-04	-0.242081E-04	-0.379485E-05	0.176840E-06

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
89	1	-0.164085E-04	-0.222853E-04	-0.210168E-04	-0.183975E-05	-0.825227E-05
90	1	-0.471073E-07	-0.409134E-04	-0.163493E-04	-0.403593E-06	-0.770245E-05
91	1	-0.164099E-03	-0.492297E-04	-0.495525E-05	0.279584E-04	0.156705E-04
92	1	-0.456696E-04	0.862153E-05	0.355297E-04	0.166730E-04	-0.572558E-06
93	1	-0.946596E-05	-0.657767E-06	0.507071E-04	0.405758E-05	0.145762E-05
94	1	0.356351E-05	0.399279E-06	0.506291E-04	0.178219E-05	0.788970E-06
95	1	0.800993E-05	0.321670E-07	0.482582E-04	0.618562E-06	0.817245E-06
96	1	0.100871E-04	0.316600E-07	0.445507E-04	0.335136E-06	0.831919E-06
97	1	0.115819E-04	0.718364E-08	0.402537E-04	0.259172E-06	0.914003E-06
98	1	0.129601E-04	0.566570E-08	0.354595E-04	0.243761E-06	0.100972E-05
99	1	0.142830E-04	0.387308E-08	0.301796E-04	0.232995E-06	0.111105E-05
100	1	0.155331E-04	0.302816E-08	0.244184E-04	0.218331E-06	0.120812E-05
101	1	0.166863E-04	0.225009E-08	0.181984E-04	0.200279E-06	0.129911E-05
102	1	0.177332E-04	0.438513E-08	0.115559E-04	0.176464E-06	0.138074E-05
103	1	0.186349E-04	0.490490E-08	0.454397E-05	0.137735E-06	0.145499E-05
104	1	0.193049E-04	0.480441E-08	-0.274425E-05	0.615553E-07	0.151819E-05
105	1	0.194998E-04	0.100058E-07	-0.100983E-04	-0.117978E-06	0.155644E-05
106	1	0.185239E-04	-0.670298E-09	-0.170041E-04	-0.526742E-06	0.153805E-05
107	1	0.147829E-04	-0.557384E-07	-0.223288E-04	-0.127056E-05	0.135329E-05
108	1	0.572887E-05	-0.134433E-06	-0.242725E-04	-0.205121E-05	0.704191E-06
109	1	-0.838725E-05	0.103595E-06	-0.211653E-04	-0.197564E-05	-0.124011E-05

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
110	1	-0.159925E-04	-0.203000E-05	-0.151022E-04	0.115975E-05	-0.359954E-05
111	1	0.328572E-05	0.422757E-05	-0.818861E-05	0.390173E-05	-0.748098E-05

FINISH

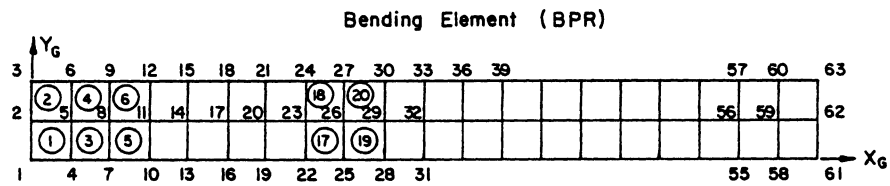
Section 8.11.4

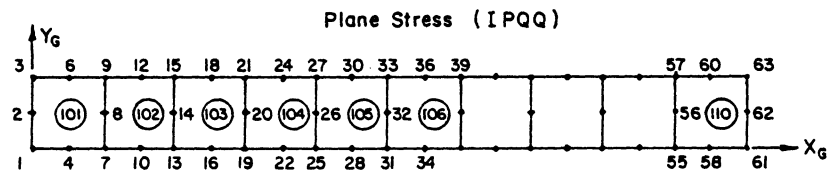
For the same T beam, maybe the 'IPLQCSH' element is not good enough to model a web which has a lot of bending effect.

So, instead of 'IPLQCSH,' let's use 'IPQQ' which has given a pretty good answer for the bending problem. (Section 8.8.4)

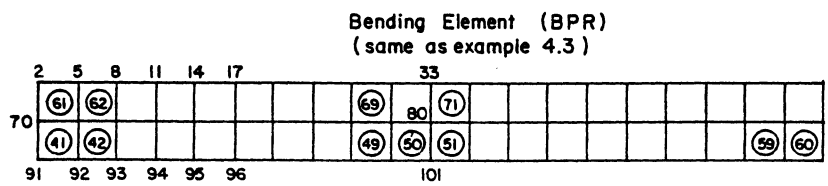
Try the following model:

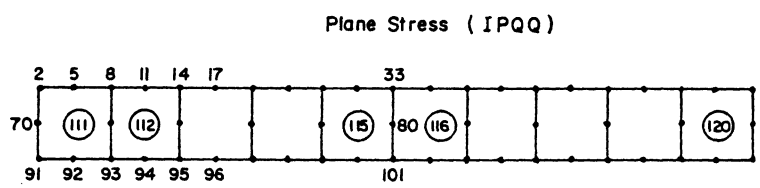
Flange (Top plate)





Web:





Again, this model will produce incompatibility along the interface of the element.

Let's look at the following:

Top flange

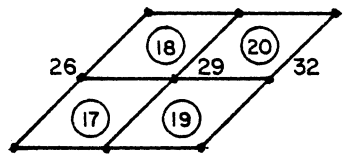
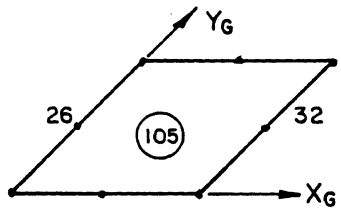
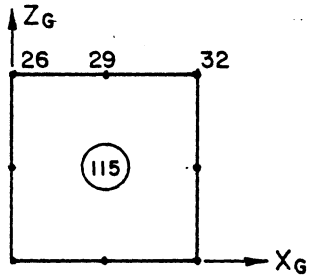


Plate Bending



Plane Stress

Web



Plane Stress

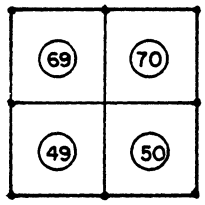


Plate Bending

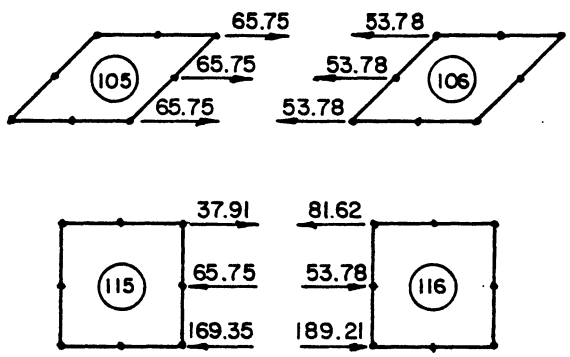
The in-plane displacement X of the web element 115 at joint 29 will not be matched with the flange element 105.

Results:

Plate Bending: From 'QQSTJTAV'

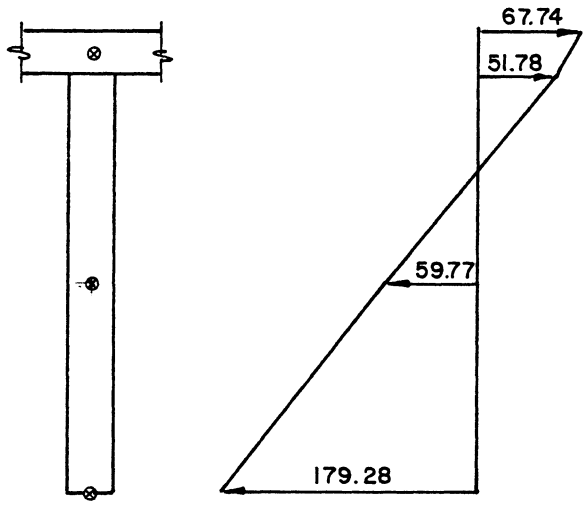
Joint	M_{xx}
31	1.99
32	1.33
33	1.99

Flange Plane Stress



Joint	x
31	59.77
32	59.77
33	59.77
80	-59.77
101	-179.28

The Stresses: Bending:



Joint	max
31	11.94
32	7.98
33	11.94

```
STRUDL 'BEAM'   'T BEAM WITH SHELL ELEMENTS'
*****************************************************************
*                                                               *
*   MCAUTO STRUDL                          RELEASE 4.5  APR 1981  *
*   MCAUTO STRUDL DYNAL                    RELEASE 6.5            *
*   MCAUTO STRUDL PLOTS                    RELEASE 3.5            *
*                                                               *
*                                                               *
*                    TIME 17.28.49,  2/08/82                    *
*                                                               *
*                  DATA POOL SIZE   30640 BYTES                 *
*                                                               *
*****************************************************************


$                                          BDEROCBS12

$ RUN OF A CANTELEVER T BEAM UNDER A CONCENTRATED LOAD.

$ THIS EXAMPLE WILL ILLUSTRATE A RUN WHICH USES THE FOLLOWING

$ ELEMENTS:

$          - PLATE BENDING 'BPR'

$          - PLANE STRESS 'IPQQ'

$ THIS EXAMPLE SIMULATED THE BEAM AS A FOLDED PLATE

MESH COORDINATES

  1  TO  61  BY  3  X  0.  INCR  5.   Y -5.  Z  0.

  2  TO  62  BY  3  X  0.  INCR  5.   Y  0.  Z  0.

  3  TO  63  BY  3  X  0.  INCR  5.   Y  5.  Z  0.

$ WEB OF THE T

  70 TO  90         X  0.  INCR  5.   Y  0.  Z -5.

  91 TO 111         X  0.  INCR  5    Y  0.  Z -10.

$ PLATE BENDING

TYPE PLATE BENDING

MESH INCIDENCES
```

```
1 TO 39 BY 2 / 1 TO 58 BY 3 / 4 TO 61 BY 3 / 5 TO 62 BY 3 / 2 TO 59 BY 3

2 TO 40 BY 2 / 2 TO 59 BY 3 / 5 TO 62 BY 3 / 6 TO 63 BY 3 / 3 TO 60 BY 3

41 TO 60     / 91 TO 110    / 92 TO 111    / 71 TO 90     / 70 TO 89

61 TO 80     / 70 TO  89    / 71 TO  90    / 5 TO 62 BY 3 / 2 TO 59 BY 3

TYPE PLANE STRESS

MESH INCIDENCES

 101 TO 110 / 1 TO 55 BY 6 / 7 TO 61 BY 6 / 9 TO 63 BY 6 /  -
              3 TO 57 BY 6 / 4 TO 58 BY 6 / 8 TO 62 BY 6 /  -
              6 TO 60 BY 6 / 2 TO 56 BY 6

 111 TO 120 / 91 TO 109 BY 2 / 93 TO 111 BY 2 /  8 TO 62 BY 6 / -
               2 TO  56 BY 6 / 92 TO 110 BY 2 / 72 TO 90 BY 2 / -
               5 TO  59 BY 6 / 70 TO  88 BY 2

ELEMENT PROPERTIES

  1 TO  80 TYPE 'BPR'     THICKNESS 1.

101 TO 120 TYPE 'IPQQ'    THICKNESS 1.

CONSTANTS

E  30000000.   ALL

POISSON  0.3   ALL

G 11540000.    ALL

SUPPORT JOINTS  1  2  3  70  91

LOADING 1 'POINT LOAD AT END OF BEAM'

  JOINT 62 LOAD FORCE Z -100.

PRINT STRUCTURE DATA
```

```
****************************************
*  PROBLEM DATA FROM INTERNAL STORAGE  *
****************************************
```

JOB ID - BEAM JOB TITLE - T BEAM WITH SHELL ELEMENTS

ACTIVE UNITS -	LENGTH	FORCE	ANGLE	TEMPERATURE	TIME	MASS
	INCH	LB	RAD	FAHR	SEC	LBM

********** STRUCTURAL DATA **********

JOINT COORDINATE REFERENCE SYSTEMS ----------/

ID.	ORIGIN	X	Y	Z	ROTAT.	R1	R2	R3

JOINT COORDINATES----------/ STATUS---/

JOINT	X	Y	Z	CONDITION		
1	0.0	-5.000	0.0	SUPPORT	ACTIVE	GLOBAL
4	5.000	-5.000	0.0		ACTIVE	GLOBAL
7	10.000	-5.000	0.0		ACTIVE	GLOBAL
10	15.000	-5.000	0.0		ACTIVE	GLOBAL
13	20.000	-5.000	0.0		ACTIVE	GLOBAL
16	25.000	-5.000	0.0		ACTIVE	GLOBAL
19	30.000	-5.000	0.0		ACTIVE	GLOBAL
22	35.000	-5.000	0.0		ACTIVE	GLOBAL
25	40.000	-5.000	0.0		ACTIVE	GLOBAL
28	45.000	-5.000	0.0		ACTIVE	GLOBAL
31	50.000	-5.000	0.0		ACTIVE	GLOBAL
34	55.000	-5.000	0.0		ACTIVE	GLOBAL
37	60.000	-5.000	0.0		ACTIVE	GLOBAL
40	65.000	-5.000	0.0		ACTIVE	GLOBAL
43	70.000	-5.000	0.0		ACTIVE	GLOBAL
46	75.000	-5.000	0.0		ACTIVE	GLOBAL
49	80.000	-5.000	0.0		ACTIVE	GLOBAL
52	85.000	-5.000	0.0		ACTIVE	GLOBAL
55	90.000	-5.000	0.0		ACTIVE	GLOBAL
58	95.000	-5.000	0.0		ACTIVE	GLOBAL
61	100.000	-5.000	0.0		ACTIVE	GLOBAL
2	0.0	0.0	0.0	SUPPORT	ACTIVE	GLOBAL
5	5.000	0.0	0.0		ACTIVE	GLOBAL
8	10.000	0.0	0.0		ACTIVE	GLOBAL
11	15.000	0.0	0.0		ACTIVE	GLOBAL
14	20.000	0.0	0.0		ACTIVE	GLOBAL

17	25.000	0.0	0.0		ACTIVE	GLOBAL
20	30.000	0.0	0.0		ACTIVE	GLOBAL
23	35.000	0.0	0.0		ACTIVE	GLOBAL
26	40.000	0.0	0.0		ACTIVE	GLOBAL
29	45.000	0.0	0.0		ACTIVE	GLOBAL
32	50.000	0.0	0.0		ACTIVE	GLOBAL
35	55.000	0.0	0.0		ACTIVE	GLOBAL
38	60.000	0.0	0.0		ACTIVE	GLOBAL
41	65.000	0.0	0.0		ACTIVE	GLOBAL
44	70.000	0.0	0.0		ACTIVE	GLOBAL
47	75.000	0.0	0.0		ACTIVE	GLOBAL
50	80.000	0.0	0.0		ACTIVE	GLOBAL
53	85.000	0.0	0.0		ACTIVE	GLOBAL
56	90.000	0.0	0.0		ACTIVE	GLOBAL
59	95.000	0.0	0.0		ACTIVE	GLOBAL
62	100.000	0.0	0.0		ACTIVE	GLOBAL
3	0.0	5.000	0.0	SUPPORT	ACTIVE	GLOBAL
6	5.000	5.000	0.0		ACTIVE	GLOBAL
9	10.000	5.000	0.0		ACTIVE	GLOBAL
12	15.000	5.000	0.0		ACTIVE	GLOBAL
15	20.000	5.000	0.0		ACTIVE	GLOBAL
18	25.000	5.000	0.0		ACTIVE	GLOBAL
21	30.000	5.000	0.0		ACTIVE	GLOBAL
24	35.000	5.000	0.0		ACTIVE	GLOBAL
27	40.000	5.000	0.0		ACTIVE	GLOBAL
30	45.000	5.000	0.0		ACTIVE	GLOBAL
33	50.000	5.000	0.0		ACTIVE	GLOBAL
36	55.000	5.000	0.0		ACTIVE	GLOBAL
39	60.000	5.000	0.0		ACTIVE	GLOBAL
42	65.000	5.000	0.0		ACTIVE	GLOBAL
45	70.000	5.000	0.0		ACTIVE	GLOBAL
48	75.000	5.000	0.0		ACTIVE	GLOBAL
51	80.000	5.000	0.0		ACTIVE	GLOBAL
54	85.000	5.000	0.0		ACTIVE	GLOBAL
57	90.000	5.000	0.0		ACTIVE	GLOBAL
60	95.000	5.000	0.0		ACTIVE	GLOBAL
63	100.000	5.000	0.0		ACTIVE	GLOBAL
70	0.0	0.0	-5.000	SUPPORT	ACTIVE	GLOBAL
71	5.000	0.0	-5.000		ACTIVE	GLOBAL
72	10.000	0.0	-5.000		ACTIVE	GLOBAL
73	15.000	0.0	-5.000		ACTIVE	GLOBAL
74	20.000	0.0	-5.000		ACTIVE	GLOBAL
75	25.000	0.0	-5.000		ACTIVE	GLOBAL
76	30.000	0.0	-5.000		ACTIVE	GLOBAL
77	35.000	0.0	-5.000		ACTIVE	GLOBAL
78	40.000	0.0	-5.000		ACTIVE	GLOBAL
79	45.000	0.0	-5.000		ACTIVE	GLOBAL
80	50.000	0.0	-5.000		ACTIVE	GLOBAL
81	55.000	0.0	-5.000		ACTIVE	GLOBAL

82	60.000	0.0	-5.000		ACTIVE	GLOBAL
83	65.000	0.0	-5.000		ACTIVE	GLOBAL
84	70.000	0.0	-5.000		ACTIVE	GLOBAL
85	75.000	0.0	-5.000		ACTIVE	GLOBAL
86	80.000	0.0	-5.000		ACTIVE	GLOBAL
87	85.000	0.0	-5.000		ACTIVE	GLOBAL
88	90.000	0.0	-5.000		ACTIVE	GLOBAL
89	95.000	0.0	-5.000		ACTIVE	GLOBAL
90	100.000	0.0	-5.000		ACTIVE	GLOBAL
91	0.0	0.0	-10.000	SUPPORT	ACTIVE	GLOBAL
92	5.000	0.0	-10.000		ACTIVE	GLOBAL
93	10.000	0.0	-10.000		ACTIVE	GLOBAL
94	15.000	0.0	-10.000		ACTIVE	GLOBAL
95	20.000	0.0	-10.000		ACTIVE	GLOBAL
96	25.000	0.0	-10.000		ACTIVE	GLOBAL
97	30.000	0.0	-10.000		ACTIVE	GLOBAL
98	35.000	0.0	-10.000		ACTIVE	GLOBAL
99	40.000	0.0	-10.000		ACTIVE	GLOBAL
100	45.000	0.0	-10.000		ACTIVE	GLOBAL
101	50.000	0.0	-10.000		ACTIVE	GLOBAL
102	55.000	0.0	-10.000		ACTIVE	GLOBAL
103	60.000	0.0	-10.000		ACTIVE	GLOBAL
104	65.000	0.0	-10.000		ACTIVE	GLOBAL
105	70.000	0.0	-10.000		ACTIVE	GLOBAL
106	75.000	0.0	-10.000		ACTIVE	GLOBAL
107	80.000	0.0	-10.000		ACTIVE	GLOBAL
108	85.000	0.0	-10.000		ACTIVE	GLOBAL
109	90.000	0.0	-10.000		ACTIVE	GLOBAL
110	95.000	0.0	-10.000		ACTIVE	GLOBAL
111	100.000	0.0	-10.000		ACTIVE	GLOBAL

JOINT RELEASES----------/ELASTIC SUPPORT RELEASES----------/

JOINT	FORCE	MOMENT	THETA 1	THETA 2	THETA 3	KFX	KFY	KFZ	KMX	KMY	KMZ

ELEMENT INCIDENCES----------/--STATUS--/-----/----TYPE----/

ELEMENT	NODES					
1	1	4	5	2	ACTIVE	BPR
3	4	7	8	5	ACTIVE	BPR
5	7	10	11	8	ACTIVE	BPR
7	10	13	14	11	ACTIVE	BPR
9	13	16	17	14	ACTIVE	BPR
11	16	19	20	17	ACTIVE	BPR
13	19	22	23	20	ACTIVE	BPR
15						

	22	25	26	23	ACTIVE	BPR
17	25	28	29	26	ACTIVE	BPR
19	28	31	32	29	ACTIVE	BPR
21	31	34	35	32	ACTIVE	BPR
23	34	37	38	35	ACTIVE	BPR
25	37	40	41	38	ACTIVE	BPR
27	40	43	44	41	ACTIVE	BPR
29	43	46	47	44	ACTIVE	BPR
31	46	49	50	47	ACTIVE	BPR
33	49	52	53	50	ACTIVE	BPR
35	52	55	56	53	ACTIVE	BPR
37	55	58	59	56	ACTIVE	BPR
39	58	61	62	59	ACTIVE	BPR
2	2	5	6	3	ACTIVE	BPR
4	5	8	9	6	ACTIVE	BPR
6	8	11	12	9	ACTIVE	BPR
8	11	14	15	12	ACTIVE	BPR
10	14	17	18	15	ACTIVE	BPR
12	17	20	21	18	ACTIVE	BPR
14	20	23	24	21	ACTIVE	BPR
16	23	26	27	24	ACTIVE	BPR
18	26	29	30	27	ACTIVE	BPR
20	29	32	33	30	ACTIVE	BPR
22	32	35	36	33	ACTIVE	BPR
24	35	38	39	36	ACTIVE	BPR
26	38	41	42	39	ACTIVE	BPR
28	41	44	45	42	ACTIVE	BPR
30	44	47	48	45	ACTIVE	BPR
32	47	50	51	48	ACTIVE	BPR
34	50	53	54	51	ACTIVE	BPR
36	53	56	57	54	ACTIVE	BPR
38	56	59	60	57	ACTIVE	BPR
40	59	62	63	60	ACTIVE	BPR
41	91	92	71	70	ACTIVE	BPR
42	92	93	72	71	ACTIVE	BPR
43	93	94	73	72	ACTIVE	BPR
44	94	95	74	73	ACTIVE	BPR
45	95	96	75	74	ACTIVE	BPR
46	96	97	76	75	ACTIVE	BPR
47	97	98	77	76	ACTIVE	BPR
48	98	99	78	77	ACTIVE	BPR
49	99	100	79	78	ACTIVE	BPR
50	100	101	80	79	ACTIVE	BPR
51	101	102	81	80	ACTIVE	BPR
52	102	103	82	81	ACTIVE	BPR
53	103	104	83	82	ACTIVE	BPR
54	104	105	84	83	ACTIVE	BPR
55	105	106	85	84	ACTIVE	BPR
56	106	107	86	85	ACTIVE	BPR
57						

	107	108	87	86					ACTIVE	BPR
58	108	109	88	87					ACTIVE	BPR
59	109	110	89	88					ACTIVE	BPR
60	110	111	90	89					ACTIVE	BPR
61	70	71	5	2					ACTIVE	BPR
62	71	72	8	5					ACTIVE	BPR
63	72	73	11	8					ACTIVE	BPR
64	73	74	14	11					ACTIVE	BPR
65	74	75	17	14					ACTIVE	BPR
66	75	76	20	17					ACTIVE	BPR
67	76	77	23	20					ACTIVE	BPR
68	77	78	26	23					ACTIVE	BPR
69	78	79	29	26					ACTIVE	BPR
70	79	80	32	29					ACTIVE	BPR
71	80	81	35	32					ACTIVE	BPR
72	81	82	38	35					ACTIVE	BPR
73	82	83	41	38					ACTIVE	BPR
74	83	84	44	41					ACTIVE	BPR
75	84	85	47	44					ACTIVE	BPR
76	85	86	50	47					ACTIVE	BPR
77	86	87	53	50					ACTIVE	BPR
78	87	88	56	53					ACTIVE	BPR
79	88	89	59	56					ACTIVE	BPR
80	89	90	62	59					ACTIVE	BPR
101	1	7	9	3	4	8	6	2	ACTIVE	IPQQ
102	7	13	15	9	10	14	12	8	ACTIVE	IPQQ
103	13	19	21	15	16	20	18	14	ACTIVE	IPQQ
104	19	25	27	21	22	26	24	20	ACTIVE	IPQQ
105	25	31	33	27	28	32	30	26	ACTIVE	IPQQ
106	31	37	39	33	34	38	36	32	ACTIVE	IPQQ
107	37	43	45	39	40	44	42	38	ACTIVE	IPQQ
108	43	49	51	45	46	50	48	44	ACTIVE	IPQQ
109	49	55	57	51	52	56	54	50	ACTIVE	IPQQ
110	55	61	63	57	58	62	60	56	ACTIVE	IPQQ
111	91	93	8	2	92	72	5	70	ACTIVE	IPQQ
112	93	95	14	8	94	74	11	72	ACTIVE	IPQQ
113	95	97	20	14	96	76	17	74	ACTIVE	IPQQ
114	97	99	26	20	98	78	23	76	ACTIVE	IPQQ
115	99	101	32	26	100	80	29	78	ACTIVE	IPQQ
116	101	103	38	32	102	82	35	80	ACTIVE	IPQQ
117	103	105	44	38	104	84	41	82	ACTIVE	IPQQ
118	105	107	50	44	106	86	47	84	ACTIVE	IPQQ
119	107	109	56	50	108	88	53	86	ACTIVE	IPQQ
120	109	111	62	56	110	90	59	88	ACTIVE	IPQQ

ELEMENT PROPERTIES----------/

ELEMENT	TYPE	THICKNESS	/--------CURVATURES--------/			/----------THERMAL EXPANSION COEFFICIENTS----------/					
			K1	K2	K12	CAX	CAY	CAZ	CSXY	CSXZ	CSYZ

1	BPR	1.000
3	BPR	1.000
5	BPR	1.000
7	BPR	1.000
9	BPR	1.000
11	BPR	1.000
13	BPR	1.000
15	BPR	1.000
17	BPR	1.000
19	BPR	1.000
21	BPR	1.000
23	BPR	1.000
25	BPR	1.000
27	BPR	1.000
29	BPR	1.000
31	BPR	1.000
33	BPR	1.000
35	BPR	1.000
37	BPR	1.000
39	BPR	1.000
2	BPR	1.000
4	BPR	1.000
6	BPR	1.000
8	BPR	1.000
10	BPR	1.000
12	BPR	1.000
14	BPR	1.000
16	BPR	1.000
18	BPR	1.000
20	BPR	1.000
22	BPR	1.000
24	BPR	1.000
26	BPR	1.000
28	BPR	1.000
30	BPR	1.000
32	BPR	1.000
34	BPR	1.000
36	BPR	1.000
38	BPR	1.000
40	BPR	1.000
41	BPR	1.000
42	BPR	1.000
43	BPR	1.000
44	BPR	1.000
45	BPR	1.000
46	BPR	1.000
47		

	BPR	1.000
48	BPR	1.000
49	BPR	1.000
50	BPR	1.000
51	BPR	1.000
52	BPR	1.000
53	BPR	1.000
54	BPR	1.000
55	BPR	1.000
56	BPR	1.000
57	BPR	1.000
58	BPR	1.000
59	BPR	1.000
60	BPR	1.000
61	BPR	1.000
62	BPR	1.000
63	BPR	1.000
64	BPR	1.000
65	BPR	1.000
66	BPR	1.000
67	BPR	1.000
68	BPR	1.000
69	BPR	1.000
70	BPR	1.000
71	BPR	1.000
72	BPR	1.000
73	BPR	1.000
74	BPR	1.000
75	BPR	1.000
76	BPR	1.000
77	BPR	1.000
78	BPR	1.000
79	BPR	1.000
80	BPR	1.000
101	IPQQ	1.000
102	IPQQ	1.000
103	IPQQ	1.000
104	IPQQ	1.000
105	IPQQ	1.000
106	IPQQ	1.000
107	IPQQ	1.000
108	IPQQ	1.000
109	IPQQ	1.000
110	IPQQ	1.000
111	IPQQ	1.000
112	IPQQ	1.000
113	IPQQ	1.000
114	IPQQ	1.000
115	IPQQ	1.000
116		

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                                                                                                                    PAGE -      11

          IPQQ       1.000
117       IPQQ       1.000
118       IPQQ       1.000
119       IPQQ       1.000
120       IPQQ       1.000

MEMBER CONSTANTS-----------------------------------------------------------------------------------------------------/
CONSTANT   STANDARD VALUE   DOMAIN          VALUE       MEMBER LIST


   E         0.300000E+08    ALL

   G         0.115400E+08    ALL

DENSITY      0.999999E+00    ALL

  CTE        0.100000E+01    ALL

  BETA       0.0             ALL

POISSON      0.300000E+00    ALL



****************************************
*  END OF DATA FROM  INTERNAL STORAGE  *
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STIFFNESS ANALYSIS REDUCE BAND
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                                                                                                                    PAGE -      15


LIST FORCES DISPLACEMENTS STRESSES REACTIONS ALL
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PAGE - 16

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*RESULTS OF LATEST ANALYSES*
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PROBLEM - BEAM TITLE - T BEAM WITH SHELL ELEMENTS

ACTIVE UNITS INCH LB RAD FAHR SEC LBM

LOADING - 1 POINT LOAD AT END OF BEAM

/-ELEMENT-//												
1	NODE	1	MXX	3.408318E+00	MYY	1.022494E+00	MXY	3.912745E-01	VX	2.685010E-02	VY	2.011308E-01
	NODE	4	MXX	4.699223E+00	MYY	-9.388351E-02	MXY	6.520503E-01	VX	2.685010E-02	VY	2.685449E-01
	NODE	5	MXX	4.919632E+00	MYY	1.431248E+00	MXY	5.655375E-02	VX	9.426397E-02	VY	2.685449E-01
	NODE	2	MXX	4.413974E+00	MYY	1.324191E+00	MXY	-2.042220E-01	VX	9.426397E-02	VY	2.011308E-01
3	NODE	4	MXX	4.427593E+00	MYY	-1.753712E-01	MXY	2.804257E-01	VX	-7.970172E-02	VY	3.771876E-01
	NODE	7	MXX	3.636152E+00	MYY	9.800816E-02	MXY	1.066087E-01	VX	-7.970172E-02	VY	-2.056745E-01
	NODE	8	MXX	2.782162E+00	MYY	-3.848869E-01	MXY	-1.488069E-01	VX	-6.625638E-01	VY	-2.056745E-01
	NODE	5	MXX	5.191220E+00	MYY	1.512723E+00	MXY	2.500997E-02	VX	-6.625638E-01	VY	3.771876E-01
5	NODE	7	MXX	3.656362E+00	MYY	1.040649E-01	MXY	6.703109E-02	VX	-8.054382E-02	VY	-2.137477E-01
	NODE	10	MXX	3.285701E+00	MYY	-4.880810E-02	MXY	-7.447493E-02	VX	-8.054382E-02	VY	9.488440E-02
	NODE	11	MXX	3.718753E+00	MYY	1.348829E-01	MXY	1.337376E-03	VX	2.280881E-01	VY	9.488440E-02
	NODE	8	MXX	2.761997E+00	MYY	-3.909311E-01	MXY	1.428434E-01	VX	2.280881E-01	VY	-2.137477E-01
7	NODE	10	MXX	3.400097E+00	MYY	-1.449680E-02	MXY	-7.525563E-02	VX	-1.427946E-02	VY	4.912758E-02
	NODE	13	MXX	3.283834E+00	MYY	8.951187E-03	MXY	-3.369879E-02	VX	-1.427946E-02	VY	-4.694153E-03
	NODE	14	MXX	3.229336E+00	MYY	3.293705E-02	MXY	5.993076E-03	VX	-6.810117E-02	VY	-4.694153E-03
	NODE	11	MXX	3.604359E+00	MYY	1.005716E-01	MXY	-3.556381E-02	VX	-6.810117E-02	VY	4.912758E-02
9	NODE	13	MXX	3.253043E+00	MYY	-2.937317E-04	MXY	-3.693708E-02	VX	-4.110322E-02	VY	7.649373E-03
	NODE	16	MXX	2.984401E+00	MYY	1.176178E-03	MXY	-4.468317E-02	VX	-4.110322E-02	VY	-7.395051E-03
	NODE	17	MXX	2.962082E+00	MYY	-2.457273E-02	MXY	-4.405588E-03	VX	-5.614764E-02	VY	-7.395051E-03
	NODE	14	MXX	3.260252E+00	MYY	4.221916E-02	MXY	3.340502E-03	VX	-5.614764E-02	VY	7.649373E-03
11	NODE	16	MXX	2.985872E+00	MYY	1.503110E-03	MXY	-4.534172E-02	VX	-3.435921E-02	VY	-7.878412E-03

/-ELEMENT-//

	NODE	19	MXX	2.765110E+00	MYY	-1.070201E-03	MXY	-5.063637E-02	VX	-3.435921E-02	VY	-3.211694E-03
	NODE	20	MXX	2.762796E+00	MYY	-1.963383E-02	MXY	-1.303515E-03	VX	-2.969249E-02	VY	-3.211694E-03
	NODE	17	MXX	2.960959E+00	MYY	-2.479464E-02	MXY	3.991138E-03	VX	-2.969249E-02	VY	-7.878412E-03
13	NODE	19	MXX	2.769309E+00	MYY	7.879734E-05	MXY	-4.938211E-02	VX	-2.815658E-02	VY	-4.800405E-03
	NODE	22	MXX	2.587276E+00	MYY	-9.045005E-04	MXY	-4.778700E-02	VX	-2.815658E-02	VY	2.626458E-03
	NODE	23	MXX	2.597629E+00	MYY	5.811214E-03	MXY	1.640448E-03	VX	-2.072971E-02	VY	2.626458E-03
	NODE	20	MXX	2.758883E+00	MYY	-2.069765E-02	MXY	4.533477E-05	VX	-2.072971E-02	VY	-4.800405E-03
15	NODE	22	MXX	2.587740E+00	MYY	-7.991195E-04	MXY	-4.702477E-02	VX	-2.919408E-02	VY	2.498209E-03
	NODE	25	MXX	2.396862E+00	MYY	3.167391E-04	MXY	-4.474348E-02	VX	-2.919408E-02	VY	6.536362E-04
	NODE	26	MXX	2.396489E+00	MYY	4.936934E-03	MXY	5.693431E-04	VX	-3.103866E-02	VY	6.536362E-04
	NODE	23	MXX	2.597402E+00	MYY	5.776703E-03	MXY	-1.711948E-03	VX	-3.103866E-02	VY	2.498209E-03
17	NODE	25	MXX	2.395360E+00	MYY	-1.516342E-04	MXY	-4.501024E-02	VX	-3.125241E-02	VY	1.385189E-03
	NODE	28	MXX	2.191914E+00	MYY	1.563430E-04	MXY	-4.540426E-02	VX	-3.125241E-02	VY	-7.791270E-04
	NODE	29	MXX	2.188775E+00	MYY	-1.770318E-03	MXY	-4.307502E-04	VX	-3.341673E-02	VY	-7.791270E-04
	NODE	26	MXX	2.398619E+00	MYY	5.593240E-03	MXY	-3.672957E-05	VX	-3.341673E-02	VY	1.385189E-03
19	NODE	28	MXX	2.191935E+00	MYY	7.063150E-05	MXY	-4.561071E-02	VX	-3.105997E-02	VY	-6.348067E-04
	NODE	31	MXX	1.990494E+00	MYY	-3.789067E-04	MXY	-4.625547E-02	VX	-3.105997E-02	VY	-1.000244E-04
	NODE	32	MXX	1.990660E+00	MYY	-1.194835E-03	MXY	-1.397123E-04	VX	-3.052517E-02	VY	-1.000244E-04
	NODE	29	MXX	2.189377E+00	MYY	-1.498163E-03	MXY	5.050488E-04	VX	-3.052517E-02	VY	-6.348067E-04
21	NODE	31	MXX	1.991105E+00	MYY	-2.041459E-04	MXY	-4.622693E-02	VX	-3.058235E-02	VY	-2.514201E-04
	NODE	34	MXX	1.792422E+00	MYY	-3.075004E-04	MXY	-4.602992E-02	VX	-3.058235E-02	VY	2.453434E-04
	NODE	35	MXX	1.793410E+00	MYY	2.973080E-04	MXY	1.852570E-04	VX	-3.008559E-02	VY	2.453434E-04
	NODE	32	MXX	1.990499E+00	MYY	-1.234293E-03	MXY	-1.175346E-05	VX	-3.008559E-02	VY	-2.514201E-04
23	NODE	34	MXX	1.792449E+00	MYY	-3.761053E-04	MXY	-4.593121E-02	VX	-3.065415E-02	VY	3.623981E-04
	NODE	37	MXX	1.593015E+00	MYY	-1.937747E-04	MXY	-4.573420E-02	VX	-3.065415E-02	VY	-2.992735E-04
	NODE	38	MXX	1.592044E+00	MYY	-1.170993E-03	MXY	-1.189339E-05	VX	-3.131582E-02	VY	-2.992735E-04
	NODE	35	MXX	1.793906E+00	MYY	5.222559E-04	MXY	-2.089038E-04	VX	-3.131582E-02	VY	3.623981E-04
25	NODE	37	MXX	1.592546E+00	MYY	-3.566146E-04	MXY	-4.570943E-02	VX	-3.034485E-02	VY	1.511157E-05
	NODE	40	MXX	1.394973E+00	MYY	-2.461672E-05	MXY	-4.626464E-02	VX	-3.034485E-02	VY	-6.394838E-04
	NODE	41	MXX	1.392357E+00	MYY	-1.565278E-03	MXY	-4.594342E-04	VX	-3.099944E-02	VY	-6.394838E-04
	NODE	38	MXX	1.593115E+00	MYY	-8.273721E-04	MXY	9.577672E-05	VX	-3.099944E-02	VY	1.511157E-05
27	NODE	40	MXX	1.395041E+00	MYY	-1.099706E-04	MXY	-4.647207E-02	VX	-3.015847E-02	VY	-4.872885E-04
	NODE	43	MXX	1.199251E+00	MYY	-3.504157E-04	MXY	-4.699147E-02	VX	-3.015847E-02	VY	1.011757E-03
	NODE	44	MXX	1.201016E+00	MYY	4.460752E-03	MXY	-1.378933E-04	VX	-2.865942E-02	VY	1.011757E-03
	NODE	41	MXX	1.393023E+00	MYY	-1.260102E-03	MXY	3.814977E-04	VX	-2.865942E-02	VY	-4.872885E-04
29	NODE	43	MXX	1.201025E+00	MYY	1.312494E-04	MXY	-4.736065E-02	VX	-3.200096E-02	VY	4.818914E-04
	NODE	46	MXX	9.938757E-01	MYY	-7.249117E-04	MXY	-4.513981E-02	VX	-3.200096E-02	VY	2.566091E-03
	NODE	47	MXX	1.003851E+00	MYY	5.979240E-03	MXY	1.747278E-03	VX	-2.991676E-02	VY	2.566091E-03

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	NODE	44	MXX	1.200063E+00	MYY	4.225373E-03	MXY	-4.735664E-04	VX	-2.991676E-02	VY	4.818914E-04
31	NODE	46	MXX	9.932829E-01	MYY	-9.942651E-04	MXY	-4.416000E-02	VX	-3.326738E-02	VY	3.010884E-03
	NODE	49	MXX	7.769259E-01	MYY	-8.752346E-04	MXY	-4.304958E-02	VX	-3.326738E-02	VY	-4.955921E-03
	NODE	50	MXX	7.641702E-01	MYY	-2.033329E-02	MXY	-5.393301E-04	VX	-4.123418E-02	VY	-4.955921E-03
	NODE	47	MXX	1.005341E+00	MYY	6.517529E-03	MXY	-1.649752E-03	VX	-4.123418E-02	VY	3.010884E-03
33	NODE	49	MXX	7.844598E-01	MYY	1.265585E-03	MXY	-4.113677E-02	VX	-3.486792E-02	VY	-8.020576E-03
	NODE	52	MXX	5.650572E-01	MYY	-5.973339E-03	MXY	-2.745350E-02	VX	-3.486792E-02	VY	5.752072E-03
	NODE	53	MXX	6.172833E-01	MYY	-2.081096E-02	MXY	1.179691E-02	VX	-2.109527E-02	VY	5.752072E-03
	NODE	50	MXX	7.561977E-01	MYY	-2.260602E-02	MXY	-1.886361E-03	VX	-2.109527E-02	VY	-8.020576E-03
35	NODE	52	MXX	5.388288E-01	MYY	-1.392841E-02	MXY	-1.867338E-02	VX	-1.030218E-02	VY	1.574983E-02
	NODE	55	MXX	4.443923E-01	MYY	1.354384E-02	MXY	-4.394445E-02	VX	-1.030218E-02	VY	-6.006441E-02
	NODE	56	MXX	2.252964E-01	MYY	-1.577793E-01	MXY	-2.996573E-02	VX	-8.611637E-02	VY	-6.006441E-02
	NODE	53	MXX	6.409106E-01	MYY	-1.363641E-02	MXY	-4.694663E-03	VX	-8.611637E-02	VY	1.574983E-02
37	NODE	55	MXX	4.841887E-01	MYY	2.481651E-02	MXY	-4.740375E-02	VX	-1.804421E-02	VY	-7.551861E-02
	NODE	58	MXX	4.316544E-01	MYY	-3.993642E-02	MXY	-7.285256E-03	VX	-1.804421E-02	VY	1.110994E-01
	NODE	59	MXX	8.626544E-01	MYY	2.512100E-01	MXY	5.737744E-02	VX	1.685737E-01	VY	1.110994E-01
	NODE	56	MXX	1.867971E-01	MYY	-1.686630E-01	MXY	1.725898E-02	VX	1.685737E-01	VY	-7.551861E-02
39	NODE	58	MXX	4.692852E-01	MYY	-2.967364E-02	MXY	1.186814E-02	VX	-5.092105E-02	VY	9.701967E-02
	NODE	61	MXX	7.643318E-02	MYY	3.219144E-02	MXY	1.117165E-01	VX	-5.092105E-02	VY	-9.306872E-02
	NODE	62	MXX	-7.696545E-02	MYY	-4.193568E-01	MXY	3.095246E-02	VX	-2.410094E-01	VY	-9.306872E-02
	NODE	59	MXX	8.283075E-01	MYY	2.419323E-01	MXY	-6.889594E-02	VX	-2.410094E-01	VY	9.701967E-02
2	NODE	2	MXX	4.413974E+00	MYY	1.324191E+00	MXY	2.042227E-01	VX	9.426558E-02	VY	-2.010797E-01
	NODE	5	MXX	4.919634E+00	MYY	1.431255E+00	MXY	-5.646686E-02	VX	9.426558E-02	VY	-2.685528E-01
	NODE	6	MXX	4.699205E+00	MYY	-9.390926E-02	MXY	-6.519680E-01	VX	2.679235E-02	VY	-2.685528E-01
	NODE	3	MXX	3.408575E+00	MYY	1.022572E+00	MXY	-3.912788E-01	VX	2.679235E-02	VY	-2.010797E-01
4	NODE	5	MXX	5.191238E+00	MYY	1.512737E+00	MXY	-2.493007E-02	VX	-6.625654E-01	VY	-3.771824E-01
	NODE	8	MXX	2.782156E+00	MYY	-3.848599E-01	MXY	1.488957E-01	VX	-6.625654E-01	VY	2.056590E-01
	NODE	9	MXX	3.636101E+00	MYY	9.798145E-02	MXY	-1.065086E-01	VX	-7.972401E-02	VY	2.056590E-01
	NODE	6	MXX	4.427662E+00	MYY	-1.753731E-01	MXY	-2.803345E-01	VX	-7.972401E-02	VY	-3.771824E-01
6	NODE	8	MXX	2.762002E+00	MYY	-3.909108E-01	MXY	-1.427500E-01	VX	2.280928E-01	VY	2.137580E-01
	NODE	11	MXX	3.718770E+00	MYY	1.349249E-01	MXY	-1.243978E-03	VX	2.280928E-01	VY	-9.491223E-02
	NODE	12	MXX	3.285619E+00	MYY	-4.885483E-02	MXY	7.456720E-02	VX	-8.057743E-02	VY	-9.491223E-02
	NODE	9	MXX	3.656434E+00	MYY	1.040850E-01	MXY	-6.693882E-02	VX	-8.057743E-02	VY	2.137580E-01
8	NODE	11	MXX	3.604334E+00	MYY	1.005859E-01	MXY	3.565448E-02	VX	-6.808001E-02	VY	-4.911420E-02
	NODE	14	MXX	3.229390E+00	MYY	3.300953E-02	MXY	-5.908001E-03	VX	-6.808001E-02	VY	4.649833E-03
	NODE	15	MXX	3.283738E+00	MYY	8.880615E-03	MXY	3.378400E-02	VX	-1.431596E-02	VY	4.649833E-03
	NODE	12	MXX	3.400160E+00	MYY	-1.448441E-02	MXY	7.534641E-02	VX	-1.431596E-02	VY	-4.911420E-02
10	NODE	14	MXX	3.260116E+00	MYY	4.222202E-02	MXY	-3.268254E-03	VX	-5.605873E-02	VY	-7.622991E-03

/-ELEMENT-//----------/

	NODE	17	MXX	2.962290E+00	MYY	-2.433318E-02	MXY	4.472237E-03	VX	-5.605873E-02	VY	7.275674E-03
	NODE	18	MXX	2.984271E+00	MYY	9.770989E-04	MXY	4.475037E-02	VX	-4.116006E-02	VY	7.275674E-03
	NODE	15	MXX	3.253095E+00	MYY	-3.070831E-04	MXY	3.700987E-02	VX	-4.116006E-02	VY	-7.622991E-03
12	NODE	17	MXX	2.960835E+00	MYY	-2.483213E-02	MXY	-3.939178E-03	VX	-2.958815E-02	VY	7.949751E-03
	NODE	20	MXX	2.763005E+00	MYY	-1.932377E-02	MXY	1.344280E-03	VX	-2.958815E-02	VY	3.033214E-03
	NODE	21	MXX	2.764790E+00	MYY	-1.394272E-03	MXY	5.067796E-02	VX	-3.450469E-02	VY	3.033214E-03
	NODE	18	MXX	2.986091E+00	MYY	1.585543E-03	MXY	4.539450E-02	VX	-3.450469E-02	VY	7.949751E-03
14	NODE	20	MXX	2.758865E+00	MYY	-2.068925E-02	MXY	1.097515E-05	VX	-2.069275E-02	VY	4.843634E-03
	NODE	23	MXX	2.597700E+00	MYY	5.972207E-03	MXY	-1.595329E-03	VX	-2.069275E-02	VY	-2.734527E-03
	NODE	24	MXX	2.587000E+00	MYY	-1.105368E-03	MXY	4.783300E-02	VX	-2.827090E-02	VY	-2.734527E-03
	NODE	21	MXX	2.769513E+00	MYY	1.456738E-04	MXY	4.943930E-02	VX	-2.827090E-02	VY	4.843634E-03
16	NODE	23	MXX	2.597425E+00	MYY	5.876541E-03	MXY	1.768188E-03	VX	-3.102749E-02	VY	-2.508441E-03
	NODE	26	MXX	2.396542E+00	MYY	5.084038E-03	MXY	-5.209390E-04	VX	-3.102749E-02	VY	-7.359129E-04
	NODE	27	MXX	2.396683E+00	MYY	1.571774E-04	MXY	4.479318E-02	VX	-2.925495E-02	VY	-7.359129E-04
	NODE	24	MXX	2.587838E+00	MYY	-8.403659E-04	MXY	4.708231E-02	VX	-2.925495E-02	VY	-2.508441E-03
18	NODE	26	MXX	2.398556E+00	MYY	5.688488E-03	MXY	7.159643E-05	VX	-3.334443E-02	VY	-1.380692E-03
	NODE	29	MXX	2.188962E+00	MYY	-1.454830E-03	MXY	4.477073E-04	VX	-3.334443E-02	VY	6.118196E-04
	NODE	30	MXX	2.191640E+00	MYY	-1.579523E-04	MXY	4.542178E-02	VX	-3.135191E-02	VY	6.118196E-04
	NODE	27	MXX	2.395475E+00	MYY	-2.051592E-04	MXY	4.504567E-02	VX	-3.135191E-02	VY	-1.380692E-03
20	NODE	29	MXX	2.189395E+00	MYY	-1.408815E-03	MXY	-4.765049E-04	VX	-3.050927E-02	VY	6.425737E-04
	NODE	32	MXX	1.990715E+00	MYY	-1.039207E-03	MXY	1.503464E-04	VX	-3.050927E-02	VY	-3.609501E-06
	NODE	33	MXX	1.990221E+00	MYY	-5.706549E-04	MXY	4.626678E-02	VX	-3.115545E-02	VY	-3.609501E-06
	NODE	30	MXX	2.192099E+00	MYY	6.335974E-05	MXY	4.563996E-02	VX	-3.115545E-02	VY	6.425737E-04
22	NODE	32	MXX	1.990419E+00	MYY	-1.249194E-03	MXY	2.426775E-06	VX	-3.000538E-02	VY	3.348938E-04
	NODE	35	MXX	1.793570E+00	MYY	5.651712E-04	MXY	-2.124937E-04	VX	-3.000538E-02	VY	-4.266826E-04
	NODE	36	MXX	1.791986E+00	MYY	-6.280541E-04	MXY	4.600323E-02	VX	-3.076696E-02	VY	-4.266826E-04
	NODE	33	MXX	1.991431E+00	MYY	-8.630753E-05	MXY	4.621815E-02	VX	-3.076696E-02	VY	3.348938E-04
24	NODE	35	MXX	1.793893E+00	MYY	5.565882E-04	MXY	2.013743E-04	VX	-3.129314E-02	VY	-3.082559E-04
	NODE	38	MXX	1.592103E+00	MYY	-1.058817E-03	MXY	-3.145623E-05	VX	-3.129314E-02	VY	1.803074E-04
	NODE	39	MXX	1.592594E+00	MYY	-3.811717E-04	MXY	4.569177E-02	VX	-3.080457E-02	VY	1.803074E-04
	NODE	36	MXX	1.792740E+00	MYY	-2.961159E-04	MXY	4.592459E-02	VX	-3.080457E-02	VY	-3.082559E-04
26	NODE	38	MXX	1.593012E+00	MYY	-8.223653E-04	MXY	-1.478846E-04	VX	-3.092556E-02	VY	7.156677E-05
	NODE	41	MXX	1.392526E+00	MYY	-1.352251E-03	MXY	4.073265E-04	VX	-3.092556E-02	VY	4.803857E-04
	NODE	42	MXX	1.394569E+00	MYY	-2.741218E-04	MXY	4.621270E-02	VX	-3.051673E-02	VY	4.803857E-04
	NODE	39	MXX	1.592906E+00	MYY	-2.514720E-04	MXY	4.565749E-02	VX	-3.051673E-02	VY	7.156677E-05
28	NODE	41	MXX	1.392970E+00	MYY	-1.267672E-03	MXY	-4.181659E-04	VX	-2.863589E-02	VY	5.433774E-04
	NODE	44	MXX	1.201077E+00	MYY	4.492760E-03	MXY	8.331491E-05	VX	-2.863589E-02	VY	-1.072763E-03
	NODE	45	MXX	1.199000E+00	MYY	-4.045367E-04	MXY	4.693728E-02	VX	-3.025203E-02	VY	-1.072763E-03

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	NODE	42	MXX	1.395254E+00	MYY	-2.026558E-05	MXY	4.643580E-02	VX	-3.025203E-02	VY	5.433774E-04
30	NODE	44	MXX	1.199950E+00	MYY	4.153728E-03	MXY	3.938808E-04	VX	-2.983224E-02	VY	-3.488723E-04
	NODE	47	MXX	1.004004E+00	MYY	6.189048E-03	MXY	-1.862784E-03	VX	-2.983224E-02	VY	-2.759197E-03
	NODE	48	MXX	9.932883E-01	MYY	-1.028299E-03	MXY	4.502475E-02	VX	-3.224257E-02	VY	-2.759197E-03
	NODE	45	MXX	1.201491E+00	MYY	3.441572E-04	MXY	4.728146E-02	VX	-3.224257E-02	VY	-3.488723E-04
32	NODE	47	MXX	1.005223E+00	MYY	6.523907E-03	MXY	1.536337E-03	VX	-4.114097E-02	VY	-2.893861E-03
	NODE	50	MXX	7.643763E-01	MYY	-2.004468E-02	MXY	4.080040E-04	VX	-4.114097E-02	VY	4.726999E-03
	NODE	51	MXX	7.763071E-01	MYY	-1.250029E-03	MXY	4.291864E-02	VX	-3.352010E-02	VY	4.726999E-03
	NODE	48	MXX	9.937857E-01	MYY	-8.483529E-04	MXY	4.404698E-02	VX	-3.352010E-02	VY	-2.893861E-03
34	NODE	50	MXX	7.560936E-01	MYY	-2.266335E-02	MXY	1.881324E-03	VX	-2.123003E-02	VY	7.964808E-03
	NODE	53	MXX	6.171107E-01	MYY	-2.167565E-02	MXY	-1.183777E-02	VX	-2.123003E-02	VY	-5.333986E-03
	NODE	54	MXX	5.657046E-01	MYY	-4.940569E-03	MXY	2.740796E-02	VX	-3.452884E-02	VY	-5.333986E-03
	NODE	51	MXX	7.840076E-01	MYY	1.193881E-03	MXY	4.112704E-02	VX	-3.452884E-02	VY	7.964808E-03
36	NODE	53	MXX	6.398705E-01	MYY	-1.488268E-02	MXY	4.365556E-03	VX	-8.549881E-02	VY	-1.489351E-02
	NODE	56	MXX	2.262076E-01	MYY	-1.569626E-01	MXY	2.960081E-02	VX	-8.549881E-02	VY	5.936470E-02
	NODE	57	MXX	4.426423E-01	MYY	1.247346E-02	MXY	4.356876E-02	VX	-1.124064E-02	VY	5.936470E-02
	NODE	54	MXX	5.406131E-01	MYY	-1.243323E-02	MXY	1.833351E-02	VX	-1.124064E-02	VY	-1.489351E-02
38	NODE	56	MXX	1.855875E-01	MYY	-1.692734E-01	MXY	-1.792605E-02	VX	1.698795E-01	VY	7.660657E-02
	NODE	59	MXX	8.649824E-01	MYY	2.555494E-01	MXY	-5.808033E-02	VX	1.698795E-01	VY	-1.137185E-01
	NODE	60	MXX	4.265538E-01	MYY	-4.519206E-02	MXY	6.550662E-03	VX	-2.044548E-02	VY	-1.137185E-01
	NODE	57	MXX	4.880397E-01	MYY	2.621740E-02	MXY	4.670497E-02	VX	-2.044548E-02	VY	7.660657E-02
40	NODE	59	MXX	8.280621E-01	MYY	2.425324E-01	MXY	6.863314E-02	VX	-2.407264E-01	VY	-9.710300E-02
	NODE	62	MXX	-7.613182E-02	MYY	-4.179963E-01	MXY	-3.101830E-02	VX	-2.407264E-01	VY	9.242934E-02
	NODE	63	MXX	7.589185E-02	MYY	3.077075E-02	MXY	-1.118066E-01	VX	-5.119405E-02	VY	9.242934E-02
	NODE	60	MXX	4.697247E-01	MYY	-3.030026E-02	MXY	-1.215525E-02	VX	-5.119405E-02	VY	-9.710300E-02
41	NODE	91	MXX	-1.687219E-04	MYY	-5.061655E-05	MXY	-5.524178E-06	VX	2.896374E-05	VY	1.788847E-05
	NODE	92	MXX	-4.048944E-05	MYY	9.415429E-06	MXY	3.173556E-05	VX	2.896374E-05	VY	-1.344039E-06
	NODE	71	MXX	-3.059565E-05	MYY	-9.214626E-06	MXY	4.001491E-05	VX	9.731233E-06	VY	-1.344039E-06
	NODE	70	MXX	-7.927950E-05	MYY	-2.378384E-05	MXY	2.755182E-06	VX	9.731233E-06	VY	1.788847E-05
42	NODE	92	MXX	-4.988108E-05	MYY	6.597940E-06	MXY	4.181782E-05	VX	5.427310E-06	VY	2.775223E-07
	NODE	93	MXX	-8.553782E-06	MYY	5.481361E-07	MXY	5.257505E-05	VX	5.427310E-06	VY	7.254032E-07
	NODE	72	MXX	-3.536582E-06	MYY	2.460547E-07	MXY	4.599617E-05	VX	5.875187E-06	VY	7.254032E-07
	NODE	71	MXX	-3.187948E-05	MYY	-9.599783E-06	MXY	3.523896E-05	VX	5.875187E-06	VY	2.775223E-07
43	NODE	93	MXX	-1.194681E-05	MYY	-4.700460E-07	MXY	4.865462E-05	VX	2.797163E-06	VY	1.629795E-06
	NODE	94	MXX	5.295794E-06	MYY	4.689227E-07	MXY	5.155080E-05	VX	2.797163E-06	VY	9.294342E-07
	NODE	73	MXX	5.388252E-06	MYY	6.417788E-06	MXY	5.126625E-05	VX	2.096801E-06	VY	9.294342E-07
	NODE	72	MXX	-2.408064E-06	MYY	5.848897E-07	MXY	4.837007E-05	VX	2.096801E-06	VY	1.629795E-06
44	NODE	94	MXX	3.627829E-06	MYY	-3.115474E-08	MXY	5.114035E-05	VX	8.058987E-07	VY	1.126941E-06

PAGE - 21

/-ELEMENT-//----------/

	NODE	95	MXX	8.697215E-06	MYY	1.378085E-07	MXY	4.884043E-05	VX	8.058987E-07	VY	6.630780E-07
	NODE	74	MXX	5.701931E-06	MYY	7.443101E-06	MXY	4.867876E-05	VX	3.420362E-07	VY	6.630780E-07
	NODE	73	MXX	4.708303E-06	MYY	6.213492E-06	MXY	5.097869E-05	VX	3.420362E-07	VY	1.126941E-06
45	NODE	95	MXX	8.030983E-06	MYY	-6.161645E-08	MXY	4.871072E-05	VX	3.642797E-07	VY	8.639431E-07
	NODE	96	MXX	1.027396E-05	MYY	6.322716E-08	MXY	4.499640E-05	VX	3.642797E-07	VY	8.135511E-07
	NODE	75	MXX	7.351859E-06	MYY	8.273412E-06	MXY	4.491475E-05	VX	3.138877E-07	VY	8.135511E-07
	NODE	74	MXX	6.040706E-06	MYY	7.544291E-06	MXY	4.862905E-05	VX	3.138877E-07	VY	8.639431E-07
46	NODE	96	MXX	1.006376E-05	MYY	-3.228706E-10	MXY	4.495135E-05	VX	2.667265E-07	VY	8.484822E-07
	NODE	97	MXX	1.175991E-05	MYY	3.725563E-08	MXY	4.064383E-05	VX	2.667265E-07	VY	9.055793E-07
	NODE	76	MXX	8.524176E-06	MYY	9.159256E-06	MXY	4.066783E-05	VX	3.238235E-07	VY	9.055793E-07
	NODE	75	MXX	7.315564E-06	MYY	8.263011E-06	MXY	4.497533E-05	VX	3.238235E-07	VY	8.484822E-07
47	NODE	97	MXX	1.158594E-05	MYY	-1.475837E-08	MXY	4.061165E-05	VX	2.524181E-07	VY	9.344786E-07
	NODE	98	MXX	1.318213E-05	MYY	2.977777E-08	MXY	3.580378E-05	VX	2.524181E-07	VY	1.006068E-06
	NODE	77	MXX	9.568185E-06	MYY	1.018318E-05	MXY	3.591015E-05	VX	3.240091E-07	VY	1.006068E-06
	NODE	76	MXX	8.494982E-06	MYY	9.150321E-06	MXY	4.071802E-05	VX	3.240091E-07	VY	9.344786E-07
48	NODE	98	MXX	1.299940E-05	MYY	-2.521574E-08	MXY	3.579394E-05	VX	2.421992E-07	VY	1.038788E-06
	NODE	99	MXX	1.451593E-05	MYY	3.254991E-08	MXY	3.047168E-05	VX	2.421992E-07	VY	1.103761E-06
	NODE	78	MXX	1.053588E-05	MYY	1.118705E-05	MXY	3.059329E-05	VX	3.071727E-07	VY	1.103761E-06
	NODE	77	MXX	9.548770E-06	MYY	1.017753E-05	MXY	3.591554E-05	VX	3.071727E-07	VY	1.038788E-06
49	NODE	99	MXX	1.433385E-05	MYY	-2.207253E-08	MXY	3.046867E-05	VX	2.285837E-07	VY	1.138594E-06
	NODE	100	MXX	1.577246E-05	MYY	2.510751E-08	MXY	2.464961E-05	VX	2.285837E-07	VY	1.204942E-06
	NODE	79	MXX	1.145552E-05	MYY	1.217420E-05	MXY	2.477532E-05	VX	2.949335E-07	VY	1.204942E-06
	NODE	78	MXX	1.052797E-05	MYY	1.118468E-05	MXY	3.059438E-05	VX	2.949335E-07	VY	1.138594E-06
50	NODE	100	MXX	1.559834E-05	MYY	-2.712932E-08	MXY	2.464933E-05	VX	2.149779E-07	VY	1.239056E-06
	NODE	101	MXX	1.693722E-05	MYY	3.134573E-08	MXY	1.836669E-05	VX	2.149779E-07	VY	1.294482E-06
	NODE	80	MXX	1.231864E-05	MYY	1.306409E-05	MXY	1.847737E-05	VX	2.704059E-07	VY	1.294482E-06
	NODE	79	MXX	1.145196E-05	MYY	1.217313E-05	MXY	2.476001E-05	VX	2.704059E-07	VY	1.239056E-06
51	NODE	101	MXX	1.677866E-05	MYY	-1.622084E-08	MXY	1.836532E-05	VX	1.911338E-07	VY	1.324868E-06
	NODE	102	MXX	1.798576E-05	MYY	1.905755E-08	MXY	1.165648E-05	VX	1.911338E-07	VY	1.384891E-06
	NODE	81	MXX	1.309939E-05	MYY	1.390725E-05	MXY	1.176498E-05	VX	2.511590E-07	VY	1.384891E-06
	NODE	80	MXX	1.231200E-05	MYY	1.306210E-05	MXY	1.847382E-05	VX	2.511590E-07	VY	1.324868E-06
52	NODE	102	MXX	1.784987E-05	MYY	-2.170873E-08	MXY	1.165430E-05	VX	1.637979E-07	VY	1.412013E-06
	NODE	103	MXX	1.886618E-05	MYY	2.667457E-08	MXY	4.582127E-06	VX	1.637979E-07	VY	1.458833E-06
	NODE	82	MXX	1.377890E-05	MYY	1.459641E-05	MXY	4.670124E-06	VX	2.106199E-07	VY	1.458833E-06
	NODE	81	MXX	1.309911E-05	MYY	1.390717E-05	MXY	1.174229E-05	VX	2.106199E-07	VY	1.412013E-06
53	NODE	103	MXX	1.875799E-05	MYY	-5.779839E-09	MXY	4.573655E-06	VX	1.179464E-07	VY	1.477388E-06
	NODE	104	MXX	1.951444E-05	MYY	4.435606E-09	MXY	-2.803683E-06	VX	1.179464E-07	VY	1.533435E-06
	NODE	83	MXX	1.427053E-05	MYY	1.521570E-05	MXY	-2.705574E-06	VX	1.739949E-07	VY	1.533435E-06

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	NODE	82	MXX	1.376348E-05	MYY	1.459178E-05	MXY	4.671764E-06	VX	1.739949E-07	VY	1.477388E-06
54	NODE	104	MXX	1.948577E-05	MYY	-4.163667E-09	MXY	-2.793298E-06	VX	2.885541E-08	VY	1.529190E-06
	NODE	105	MXX	1.969728E-05	MYY	-2.810975E-08	MXY	-1.029901E-05	VX	2.885541E-08	VY	1.607855E-06
	NODE	84	MXX	1.465658E-05	MYY	1.546367E-05	MXY	-1.028179E-05	VX	1.075219E-07	VY	1.607855E-06
	NODE	83	MXX	1.422063E-05	MYY	1.520073E-05	MXY	-2.776082E-06	VX	1.075219E-07	VY	1.529190E-06
55	NODE	105	MXX	1.998493E-05	MYY	5.818856E-08	MXY	-1.024244E-05	VX	-2.525937E-07	VY	1.494182E-06
	NODE	106	MXX	1.861484E-05	MYY	-2.135721E-07	MXY	-1.728126E-05	VX	-2.525937E-07	VY	1.759725E-06
	NODE	85	MXX	1.502710E-05	MYY	1.481242E-05	MXY	-1.752093E-05	VX	1.295194E-08	VY	1.759725E-06
	NODE	84	MXX	1.437587E-05	MYY	1.537945E-05	MXY	-1.048211E-05	VX	1.295194E-08	VY	1.494182E-06
56	NODE	106	MXX	1.952356E-05	MYY	5.904440E-08	MXY	-1.728482E-05	VX	-9.492280E-07	VY	1.559202E-06
	NODE	107	MXX	1.339570E-05	MYY	1.693479E-08	MXY	-2.199887E-05	VX	-9.492280E-07	VY	1.540339E-06
	NODE	86	MXX	1.320736E-05	MYY	1.021782E-05	MXY	-2.286519E-05	VX	-9.680361E-07	VY	1.540389E-06
	NODE	85	MXX	1.493318E-05	MYY	1.478424E-05	MXY	-1.815113E-05	VX	-9.680361E-07	VY	1.559202E-06
57	NODE	107	MXX	1.461513E-05	MYY	3.827663E-07	MXY	-2.220769E-05	VX	-1.951793E-06	VY	1.186897E-06
	NODE	108	MXX	2.793944E-06	MYY	-4.827152E-07	MXY	-2.424879E-05	VX	-1.951793E-06	VY	6.455563E-07
	NODE	87	MXX	3.416233E-06	MYY	3.091127E-06	MXY	-2.482897E-05	VX	-2.493132E-06	VY	6.455563E-07
	NODE	86	MXX	1.265933E-05	MYY	1.005341E-05	MXY	-2.278786E-05	VX	-2.493132E-06	VY	1.186897E-06
58	NODE	108	MXX	4.207903E-06	MYY	-5.852780E-08	MXY	-2.362896E-05	VX	-2.093003E-06	VY	1.206947E-07
	NODE	109	MXX	-8.626511E-06	MYY	-8.286497E-07	MXY	-2.318788E-05	VX	-2.093003E-06	VY	-1.215554E-06
	NODE	88	MXX	-7.384602E-06	MYY	-9.971661E-06	MXY	-2.578109E-05	VX	-3.429251E-06	VY	-1.215554E-06
	NODE	87	MXX	2.205872E-06	MYY	2.728019E-06	MXY	-2.622219E-05	VX	-3.429251E-06	VY	1.206947E-07
59	NODE	109	MXX	-7.226020E-06	MYY	-4.085023E-07	MXY	-2.180097E-05	VX	-9.178189E-07	VY	-1.085196E-06
	NODE	110	MXX	-1.304217E-05	MYY	-5.581805E-07	MXY	-1.540771E-05	VX	-9.178189E-07	VY	-3.678402E-06
	NODE	89	MXX	-9.294781E-06	MYY	-2.821519E-05	MXY	-2.159053E-05	VX	-3.511023E-06	VY	-3.678402E-06
	NODE	88	MXX	-5.332326E-06	MYY	-9.355977E-06	MXY	-2.798378E-05	VX	-3.511023E-06	VY	-1.085196E-06
60	NODE	110	MXX	-1.276921E-05	MYY	-4.759349E-07	MXY	-1.521835E-05	VX	2.974710E-06	VY	-3.383645E-06
	NODE	111	MXX	3.543478E-06	MYY	2.547011E-06	MXY	-6.214410E-06	VX	2.974710E-06	VY	-6.396323E-06
	NODE	90	MXX	1.659510E-06	MYY	-3.714510E-05	MXY	-1.163230E-05	VX	-3.796868E-08	VY	-6.396323E-06
	NODE	89	MXX	-7.547311E-06	MYY	-2.769152E-05	MXY	-2.063623E-05	VX	-3.796868E-08	VY	-3.383645E-06
61	NODE	70	MXX	-7.927934E-05	MYY	-2.378380E-05	MXY	-1.624597E-06	VX	1.035328E-05	VY	2.434288E-05
	NODE	71	MXX	-2.966264E-05	MYY	-6.104145E-06	MXY	3.747930E-05	VX	1.035328E-05	VY	-1.055407E-06
	NODE	5	MXX	-3.823808E-05	MYY	-4.388872E-06	MXY	4.127822E-05	VX	-1.504502E-05	VY	-1.055407E-06
	NODE	2	MXX	4.243513E-05	MYY	1.273054E-05	MXY	2.174327E-06	VX	-1.504502E-05	VY	2.434288E-05
62	NODE	71	MXX	-3.094631E-05	MYY	-6.489243E-06	MXY	3.854475E-05	VX	4.785315E-06	VY	1.593087E-06
	NODE	72	MXX	-4.238228E-06	MYY	-2.092765E-06	MXY	4.703863E-05	VX	4.785315E-06	VY	8.488047E-06
	NODE	8	MXX	2.320419E-05	MYY	2.563714E-05	MXY	5.010686E-05	VX	1.168028E-05	VY	8.488047E-06
	NODE	5	MXX	-2.627925E-05	MYY	-8.012248E-07	MXY	4.161298E-05	VX	1.168028E-05	VY	1.593087E-06
63	NODE	72	MXX	-3.109865E-06	MYY	-1.754302E-06	MXY	4.665070E-05	VX	2.632675E-06	VY	8.489561E-06

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	NODE	73	MXX	5.490328E-06	MYY	6.757896E-06	MXY	5.089425E-05	VX	2.632675E-06	VY	2.178567E-07
	NODE	11	MXX	-4.113690E-07	MYY	1.407566E-05	MXY	5.145396E-05	VX	-5.639027E-06	VY	2.178567E-07
	NODE	8	MXX	2.434004E-05	MYY	2.597793E-05	MXY	4.721041E-05	VX	-5.639027E-06	VY	8.489561E-06
64	NODE	73	MXX	4.810501E-06	MYY	6.553858E-06	MXY	5.175802E-05	VX	2.772773E-07	VY	9.595533E-07
	NODE	74	MXX	5.706856E-06	MYY	7.459811E-06	MXY	4.863148E-05	VX	2.772773E-07	VY	9.716459E-07
	NODE	14	MXX	4.543961E-06	MYY	1.493841E-05	MXY	4.863653E-05	VX	2.893702E-07	VY	9.716459E-07
	NODE	11	MXX	2.617153E-06	MYY	1.498431E-05	MXY	5.176305E-05	VX	2.893702E-07	VY	9.595533E-07
65	NODE	74	MXX	6.046128E-06	MYY	7.561771E-06	MXY	4.847246E-05	VX	3.180554E-07	VY	9.008559E-07
	NODE	75	MXX	7.363258E-06	MYY	8.312003E-06	MXY	4.501881E-05	VX	3.180554E-07	VY	7.475434E-07
	NODE	17	MXX	4.445140E-06	MYY	1.608914E-05	MXY	4.560944E-05	VX	1.647422E-07	VY	7.475434E-07
	NODE	14	MXX	4.529555E-06	MYY	1.493391E-05	MXY	4.906309E-05	VX	1.647422E-07	VY	9.008559E-07
66	NODE	75	MXX	7.327251E-06	MYY	8.301379E-06	MXY	4.489254E-05	VX	3.152834E-07	VY	8.103206E-07
	NODE	76	MXX	8.522780E-06	MYY	9.155196E-06	MXY	4.073267E-05	VX	3.152834E-07	VY	9.213232E-07
	NODE	20	MXX	5.404435E-06	MYY	1.826213E-05	MXY	4.164825E-05	VX	4.262860E-07	VY	9.213232E-07
	NODE	17	MXX	4.723295E-06	MYY	1.617242E-05	MXY	4.580815E-05	VX	4.262860E-07	VY	8.103206E-07
67	NODE	76	MXX	8.493947E-06	MYY	9.146281E-06	MXY	4.067051E-05	VX	3.244677E-07	VY	9.734913E-07
	NODE	77	MXX	9.567565E-06	MYY	1.018170E-05	MXY	3.591790E-05	VX	3.244677E-07	VY	9.934893E-07
	NODE	23	MXX	5.870705E-06	MYY	2.033624E-05	MXY	3.693608E-05	VX	3.444663E-07	VY	9.934893E-07
	NODE	20	MXX	5.636034E-06	MYY	1.833188E-05	MXY	4.168871E-05	VX	3.444663E-07	VY	9.734913E-07
68	NODE	77	MXX	9.548302E-06	MYY	1.017597E-05	MXY	3.592024E-05	VX	3.059234E-07	VY	1.042262E-06
	NODE	78	MXX	1.053354E-05	MYY	1.117924E-05	MXY	3.058766E-05	VX	3.059234E-07	VY	1.129517E-06
	NODE	26	MXX	6.578967E-06	MYY	2.247567E-05	MXY	3.160100E-05	VX	3.931794E-07	VY	1.129517E-06
	NODE	23	MXX	6.095369E-06	MYY	2.040360E-05	MXY	3.693359E-05	VX	3.931794E-07	VY	1.042262E-06
69	NODE	78	MXX	1.052563E-05	MYY	1.117687E-05	MXY	3.060407E-05	VX	2.949334E-07	VY	1.170861E-06
	NODE	79	MXX	1.145318E-05	MYY	1.216639E-05	MXY	2.475113E-05	VX	2.949334E-07	VY	1.209070E-06
	NODE	29	MXX	7.065055E-06	MYY	2.441349E-05	MXY	2.571392E-05	VX	3.331444E-07	VY	1.209070E-06
	NODE	26	MXX	6.777783E-06	MYY	2.253531E-05	MXY	3.156686E-05	VX	3.331444E-07	VY	1.170861E-06
70	NODE	79	MXX	1.144962E-05	MYY	1.216532E-05	MXY	2.478532E-05	VX	2.696253E-07	VY	1.244716E-06
	NODE	80	MXX	1.231512E-05	MYY	1.305238E-05	MXY	1.846279E-05	VX	2.696253E-07	VY	1.338648E-06
	NODE	32	MXX	7.755023E-06	MYY	2.631370E-05	MXY	1.935533E-05	VX	3.635572E-07	VY	1.338648E-06
	NODE	29	MXX	7.239713E-06	MYY	2.446589E-05	MXY	2.567786E-05	VX	3.635572E-07	VY	1.244716E-06
71	NODE	80	MXX	1.230846E-05	MYY	1.305038E-05	MXY	1.849065E-05	VX	2.522644E-07	VY	1.372631E-06
	NODE	81	MXX	1.309755E-05	MYY	1.390102E-05	MXY	1.172887E-05	VX	2.522644E-07	VY	1.389330E-06
	NODE	35	MXX	8.107098E-06	MYY	2.792211E-05	MXY	1.254299E-05	VX	2.689652E-07	VY	1.389330E-06
	NODE	32	MXX	7.918268E-06	MYY	2.636267E-05	MXY	1.930477E-05	VX	2.689652E-07	VY	1.372631E-06
72	NODE	81	MXX	1.309723E-05	MYY	1.390092E-05	MXY	1.177670E-05	VX	2.078091E-07	VY	1.415891E-06
	NODE	82	MXX	1.377281E-05	MYY	1.457611E-05	MXY	4.657659E-06	VX	2.078091E-07	VY	1.543892E-06
	NODE	38	MXX	8.832049E-06	MYY	2.955216E-05	MXY	5.382685E-06	VX	3.358109E-07	VY	1.543892E-06

PAGE - 24

/-ELEMENT-//----------/

	NODE	35	MXX	8.239577E-06	MYY	2.796185E-05	MXY	1.250173E-05	VX	3.358109E-07	VY	1.415891E-06
73	NODE	82	MXX	1.375739E-05	MYY	1.457148E-05	MXY	4.692914E-06	VX	1.764936E-07	VY	1.574558E-06
	NODE	83	MXX	1.426819E-05	MYY	1.520789E-05	MXY	-2.778542E-06	VX	1.764936E-07	VY	1.529588E-06
	NODE	41	MXX	8.768929E-06	MYY	3.064948E-05	MXY	-2.163376E-06	VX	1.315266E-07	VY	1.529588E-06
	NODE	38	MXX	8.969958E-06	MYY	2.959353E-05	MXY	5.308080E-06	VX	1.315266E-07	VY	1.574558E-06
74	NODE	83	MXX	1.421827E-05	MYY	1.519291E-05	MXY	-2.674420E-06	VX	1.048708E-07	VY	1.564133E-06
	NODE	84	MXX	1.465026E-05	MYY	1.544258E-05	MXY	-1.042821E-05	VX	1.048708E-07	VY	1.717867E-06
	NODE	44	MXX	9.392233E-06	MYY	3.186676E-05	MXY	-9.985759E-06	VX	2.586072E-07	VY	1.717867E-06
	NODE	41	MXX	8.891724E-06	MYY	3.068632E-05	MXY	-2.231970E-06	VX	2.586072E-07	VY	1.564133E-06
75	NODE	84	MXX	1.436957E-05	MYY	1.535838E-05	MXY	-1.016859E-05	VX	7.630547E-09	VY	1.828143E-06
	NODE	85	MXX	1.501277E-05	MYY	1.476477E-05	MXY	-1.834871E-05	VX	7.630547E-09	VY	1.763046E-06
	NODE	47	MXX	8.745933E-06	MYY	3.249143E-05	MXY	-1.833640E-05	VX	-5.746523E-08	VY	1.763046E-06
	NODE	44	MXX	9.662907E-06	MYY	3.194796E-05	MXY	-1.015629E-05	VX	-5.746523E-08	VY	1.828143E-06
76	NODE	85	MXX	1.491892E-05	MYY	1.473662E-05	MXY	-1.726707E-05	VX	-1.113123E-06	VY	1.637844E-06
	NODE	86	MXX	1.297542E-05	MYY	9.444803E-06	MXY	-2.342313E-05	VX	-1.113123E-06	VY	4.547286E-06
	NODE	50	MXX	1.683384E-05	MYY	3.514376E-05	MXY	-2.514728E-05	VX	1.796319E-06	VY	4.547286E-06
	NODE	47	MXX	8.026063E-06	MYY	3.227546E-05	MXY	-1.899122E-05	VX	1.796319E-06	VY	1.637844E-06
77	NODE	86	MXX	1.242743E-05	MYY	9.280405E-06	MXY	-2.190041E-05	VX	-2.499537E-06	VY	4.631884E-06
	NODE	87	MXX	3.174727E-06	MYY	2.286105E-06	MXY	-2.713875E-05	VX	-2.499537E-06	VY	1.313075E-06
	NODE	53	MXX	-2.665949E-06	MYY	1.666178E-05	MXY	-3.361973E-05	VX	-5.818341E-06	VY	1.313075E-06
	NODE	50	MXX	1.670883E-05	MYY	3.510625E-05	MXY	-2.838137E-05	VX	-5.818341E-06	VY	4.631884E-06
78	NODE	87	MXX	1.964366E-06	MYY	1.922997E-06	MXY	-2.318679E-05	VX	-3.665997E-06	VY	1.756122E-06
	NODE	88	MXX	-7.981223E-06	MYY	-1.196040E-05	MXY	-2.981357E-05	VX	-3.665997E-06	VY	-2.672418E-06
	NODE	56	MXX	-1.898377E-05	MYY	-1.832857E-05	MXY	-4.558079E-05	VX	-8.094536E-06	VY	-2.672418E-06
	NODE	53	MXX	-1.661089E-06	MYY	1.696324E-05	MXY	-3.895401E-05	VX	-8.094536E-06	VY	1.756122E-06
79	NODE	88	MXX	-5.927191E-06	MYY	-1.134419E-05	MXY	-2.518659E-05	VX	-2.677190E-06	VY	-4.185082E-06
	NODE	89	MXX	-8.641356E-06	MYY	-2.603176E-05	MXY	-1.928028E-05	VX	-2.677190E-06	VY	-3.978304E-06
	NODE	59	MXX	9.492083E-06	MYY	-7.002415E-05	MXY	-4.778478E-05	VX	-2.470409E-06	VY	-3.978304E-06
	NODE	56	MXX	-2.449306E-05	MYY	-1.998135E-05	MXY	-5.369110E-05	VX	-2.470409E-06	VY	-4.185082E-06
80	NODE	89	MXX	-6.892640E-06	MYY	-2.550751E-05	MXY	-2.399820E-05	VX	8.022835E-08	VY	-5.082340E-06
	NODE	90	MXX	2.492289E-06	MYY	-3.437095E-05	MXY	-9.878485E-06	VX	8.022835E-08	VY	-1.212678E-05
	NODE	62	MXX	-7.694951E-06	MYY	-1.030078E-04	MXY	-2.507323E-05	VX	-6.964207E-06	VY	-1.212678E-05
	NODE	59	MXX	5.720372E-06	MYY	-7.115574E-05	MXY	-3.919295E-05	VX	-6.964207E-06	VY	-5.082340E-06

101	NODE	1	SXX	0.115047E+03	SYY	0.345140E+02	SXY	0.192498E+02
		7	SXX	0.115047E+03	SYY	0.387585E+01	SXY	-0.577358E+01
		9	SXX	0.115047E+03	SYY	0.387584E+01	SXY	0.577360E+01
		3	SXX	0.115047E+03	SYY	0.345139E+02	SXY	-0.192498E+02
		4	SXX	0.109322E+03	SYY	0.112289E+00	SXY	0.673811E+01

/-ELEMENT-//----------/

		8	SXX	0.116255E+03	SYY	0.423843E+01	SXY	0.230872E-04
		6	SXX	0.109322E+03	SYY	0.112274E+00	SXY	-0.673811E+01
		2	SXX	0.116255E+03	SYY	0.348766E+02	SXY	-0.209883E-05
102	NODE	7	SXX	0.101136E+03	SYY	-0.297363E+00	SXY	0.229016E+01
		13	SXX	0.101135E+03	SYY	0.154587E+01	SXY	0.291043E+01
		15	SXX	0.101135E+03	SYY	0.154582E+01	SXY	-0.291044E+01
		9	SXX	0.101136E+03	SYY	-0.297455E+00	SXY	-0.229012E+01
		10	SXX	0.100728E+03	SYY	-0.736084E+00	SXY	0.260037E+01
		14	SXX	0.102938E+03	SYY	0.208670E+01	SXY	0.145026E-04
		12	SXX	0.100728E+03	SYY	-0.736130E+00	SXY	-0.260055E+01
		8	SXX	0.102940E+03	SYY	0.243835E+00	SXY	-0.648569E-05
103	NODE	13	SXX	0.898669E+02	SYY	-0.183469E+01	SXY	0.337989E+01
		19	SXX	0.898665E+02	SYY	0.189912E+01	SXY	0.294522E+01
		21	SXX	0.898660E+02	SYY	0.189897E+01	SXY	-0.294530E+01
		15	SXX	0.898669E+02	SYY	-0.183466E+01	SXY	-0.337989E+01
		16	SXX	0.899178E+02	SYY	0.202713E+00	SXY	0.316276E+01
		20	SXX	0.893842E+02	SYY	0.175444E+01	SXY	-0.349251E-05
		18	SXX	0.899177E+02	SYY	0.202713E+00	SXY	-0.316280E+01
		14	SXX	0.893867E+02	SYY	-0.197874E+01	SXY	0.173646E-04
104	NODE	19	SXX	0.776324E+02	SYY	-0.177110E+01	SXY	0.289669E+01
		25	SXX	0.776319E+02	SYY	0.176709E+01	SXY	0.299545E+01
		27	SXX	0.776314E+02	SYY	0.176691E+01	SXY	-0.299550E+01
		21	SXX	0.776324E+02	SYY	-0.177110E+01	SXY	-0.289669E+01
		22	SXX	0.776177E+02	SYY	-0.494995E-01	SXY	0.294616E+01
		26	SXX	0.777488E+02	SYY	0.180212E+01	SXY	-0.100154E-04
		24	SXX	0.776177E+02	SYY	-0.495148E-01	SXY	-0.294632E+01
		20	SXX	0.777506E+02	SYY	-0.173564E+01	SXY	0.146459E-04
105	NODE	25	SXX	0.657520E+02	SYY	-0.179689E+01	SXY	0.300973E+01
		31	SXX	0.657509E+02	SYY	0.179851E+01	SXY	0.298571E+01
		33	SXX	0.657509E+02	SYY	0.179849E+01	SXY	-0.298533E+01
		27	SXX	0.657515E+02	SYY	-0.179707E+01	SXY	-0.300973E+01
		28	SXX	0.657546E+02	SYY	0.119934E-01	SXY	0.299780E+01
		32	SXX	0.657218E+02	SYY	0.178978E+01	SXY	0.314800E-05
		30	SXX	0.657546E+02	SYY	0.119781E-01	SXY	-0.299764E+01
		26	SXX	0.657233E+02	SYY	-0.180553E+01	SXY	0.865744E-05
106	NODE	31	SXX	0.537791E+02	SYY	-0.179301E+01	SXY	0.298320E+01
		37	SXX	0.537783E+02	SYY	0.179236E+01	SXY	0.299344E+01
		39	SXX	0.537783E+02	SYY	0.179236E+01	SXY	-0.299348E+01
		33	SXX	0.537791E+02	SYY	-0.179303E+01	SXY	-0.298286E+01
		34	SXX	0.537773E+02	SYY	-0.521851E-02	SXY	0.298857E+01
		38	SXX	0.537893E+02	SYY	0.179566E+01	SXY	0.926744E-04
		36	SXX	0.537771E+02	SYY	-0.527954E-02	SXY	-0.298840E+01

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		32	SXX	0.537922E+02	SYY	-0.178911E+01	SXY	0.111826E-03
107	NODE	37	SXX	0.418484E+02	SYY	-0.178661E+01	SXY	0.299109E+01
		43	SXX	0.418475E+02	SYY	0.178818E+01	SXY	0.296597E+01
		45	SXX	0.418475E+02	SYY	0.178819E+01	SXY	-0.296589E+01
		39	SXX	0.418484E+02	SYY	-0.178660E+01	SXY	-0.299092E+01
		40	SXX	0.418515E+02	SYY	0.124083E-01	SXY	0.297900E+01
		44	SXX	0.418167E+02	SYY	0.177895E+01	SXY	0.668168E-04
		42	SXX	0.418510E+02	SYY	0.122356E-01	SXY	-0.297883E+01
		38	SXX	0.418202E+02	SYY	-0.179506E+01	SXY	0.400137E-03
108	NODE	43	SXX	0.298127E+02	SYY	-0.182226E+01	SXY	0.298192E+01
		49	SXX	0.298118E+02	SYY	0.181657E+01	SXY	0.309153E+01
		51	SXX	0.298116E+02	SYY	0.181650E+01	SXY	-0.309149E+01
		45	SXX	0.298129E+02	SYY	-0.182219E+01	SXY	-0.298209E+01
		46	SXX	0.297972E+02	SYY	-0.545740E-01	SXY	0.303713E+01
		50	SXX	0.299407E+02	SYY	0.185524E+01	SXY	0.123713E-03
		48	SXX	0.297965E+02	SYY	-0.547857E-01	SXY	-0.303696E+01
		44	SXX	0.299442E+02	SYY	-0.178280E+01	SXY	0.334514E-03
109	NODE	49	SXX	0.182997E+02	SYY	-0.163707E+01	SXY	0.302101E+01
		55	SXX	0.182986E+02	SYY	0.171709E+01	SXY	0.244395E+01
		57	SXX	0.182982E+02	SYY	0.171698E+01	SXY	-0.244401E+01
		51	SXX	0.183001E+02	SYY	-0.163697E+01	SXY	-0.302101E+01
		52	SXX	0.183687E+02	SYY	0.271056E+00	SXY	0.273278E+01
		56	SXX	0.176543E+02	SYY	0.152379E+01	SXY	0.413253E-04
		54	SXX	0.183679E+02	SYY	0.270829E+00	SXY	-0.273278E+01
		50	SXX	0.176576E+02	SYY	-0.182972E+01	SXY	0.224842E-03
110	NODE	55	SXX	0.610698E+01	SYY	-0.194041E+01	SXY	0.298914E+01
		61	SXX	0.610536E+01	SYY	0.360837E+01	SXY	0.341989E+01
		63	SXX	0.610517E+01	SYY	0.360831E+01	SXY	-0.341981E+01
		57	SXX	0.610718E+01	SYY	-0.194035E+01	SXY	-0.298880E+01
		58	SXX	0.562286E+01	SYY	-0.778215E+00	SXY	0.320487E+01
		62	SXX	0.802348E+01	SYY	0.418381E+01	SXY	0.214492E-04
		60	SXX	0.562200E+01	SYY	-0.778476E+00	SXY	-0.320487E+01
		56	SXX	0.802856E+01	SYY	-0.136393E+01	SXY	0.409864E-03
111	NODE	91	SXX	-0.378893E+03	SYY	-0.113668E+03	SXY	-0.353931E+02
		93	SXX	-0.321419E+03	SYY	0.170295E+02	SXY	-0.345118E+01
		8	SXX	0.838698E+02	SYY	-0.276150E+02	SXY	-0.298230E+02
		2	SXX	0.141343E+03	SYY	0.424028E+02	SXY	0.619806E+00
		92	SXX	-0.344939E+03	SYY	-0.309310E+02	SXY	-0.167908E+02
		72	SXX	-0.113883E+03	SYY	-0.382533E+01	SXY	-0.864525E+01
		5	SXX	0.117823E+03	SYY	0.247822E+02	SXY	-0.119703E+02
		70	SXX	-0.113883E+03	SYY	-0.341649E+02	SXY	-0.939477E+01
112	NODE	93	SXX	-0.331159E+03	SYY	0.141076E+02	SXY	-0.567152E+01

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		95	SXX -0.275718E+03	SYY -0.148329E+01	SXY -0.513845E+01
		14	SXX 0.724055E+02	SYY -0.200085E+01	SXY -0.184264E+02
		8	SXX 0.127846E+03	SYY -0.144220E+02	SXY -0.182187E+02
		94	SXX -0.303061E+03	SYY 0.756842E+01	SXY 0.329878E+00
		74	SXX -0.102648E+03	SYY -0.203973E+01	SXY -0.147282E+02
		11	SXX 0.100503E+03	SYY -0.695399E+01	SXY -0.125873E+02
		72	SXX -0.102648E+03	SYY -0.454910E+00	SXY -0.148913E+02
113	NODE	95	SXX -0.296807E+03	SYY -0.781004E+01	SXY -0.698424E+01
		97	SXX -0.241030E+03	SYY 0.424840E+01	SXY -0.727895E+01
		20	SXX 0.621245E+02	SYY -0.769159E+01	SXY -0.190590E+02
		14	SXX 0.117901E+03	SYY 0.116478E+02	SXY -0.193103E+02
		96	SXX -0.268920E+03	SYY -0.178439E+01	SXY -0.222156E+01
		76	SXX -0.896408E+02	SYY -0.177596E+01	SXY -0.132675E+02
		17	SXX 0.900108E+02	SYY 0.197192E+01	SXY -0.142741E+02
		74	SXX -0.896430E+02	SYY 0.186163E+01	SXY -0.132467E+02
114	NODE	97	SXX -0.260940E+03	SYY -0.172446E+01	SXY -0.692098E+01
		99	SXX -0.205263E+03	SYY 0.263474E+01	SXY -0.682114E+01
		26	SXX 0.497519E+02	SYY -0.628204E+01	SXY -0.188023E+02
		20	SXX 0.105433E+03	SYY 0.530101E+01	SXY -0.187319E+02
		98	SXX -0.233111E+03	SYY 0.425491E+00	SXY -0.174700E+01
		78	SXX -0.776674E+02	SYY -0.179321E+01	SXY -0.136514E+02
		23	SXX 0.775864E+02	SYY -0.511307E+00	SXY -0.136440E+02
		76	SXX -0.776666E+02	SYY 0.181628E+01	SXY -0.136655E+02
115	NODE	99	SXX -0.225052E+03	SYY -0.330182E+01	SXY -0.690979E+01
		101	SXX -0.169355E+03	SYY 0.303322E+01	SXY -0.693192E+01
		32	SXX 0.379145E+02	SYY -0.661181E+01	SXY -0.188721E+02
		26	SXX 0.936151E+02	SYY 0.687691E+01	SXY -0.189011E+02
		100	SXX -0.197201E+03	SYY -0.125290E+00	SXY -0.185013E+01
		80	SXX -0.657458E+02	SYY -0.179372E+01	SXY -0.135539E+02
		29	SXX 0.657722E+02	SYY 0.157486E+00	SXY -0.138177E+02
		78	SXX -0.657447E+02	SYY 0.178358E+01	SXY -0.135611E+02
116	NODE	101	SXX -0.189211E+03	SYY -0.292363E+01	SXY -0.692218E+01
		103	SXX -0.133516E+03	SYY 0.300734E+01	SXY -0.690053E+01
		38	SXX 0.259256E+02	SYY -0.660428E+01	SXY -0.188641E+02
		32	SXX 0.816238E+02	SYY 0.650099E+01	SXY -0.188580E+02
		102	SXX -0.161370E+03	SYY 0.225677E-01	SXY -0.183055E+01
		82	SXX -0.537814E+02	SYY -0.179132E+01	SXY -0.135692E+02
		35	SXX 0.537765E+02	SYY -0.441132E-01	SXY -0.137802E+02
		80	SXX -0.537810E+02	SYY 0.179573E+01	SXY -0.135831E+02
117	NODE	103	SXX -0.153342E+03	SYY -0.294052E+01	SXY -0.689767E+01
		105	SXX -0.976438E+02	SYY 0.271872E+01	SXY -0.691073E+01
		44	SXX 0.140082E+02	SYY -0.630285E+01	SXY -0.188340E+02

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		38	SXX	0.697012E+02	SYY	0.652840E+01	SXY -0.188562E+02
		104	SXX	-0.125495E+03	SYY	-0.118652E+00	SXY -0.181762E+01
		84	SXX	-0.418383E+02	SYY	-0.180171E+01	SXY -0.135877E+02
		41	SXX	0.418605E+02	SYY	0.131971E+00	SXY -0.137559E+02
		82	SXX	-0.418396E+02	SYY	0.179120E+01	SXY -0.135996E+02
118	NODE	105	SXX	-0.117518E+03	SYY	-0.324362E+01	SXY -0.698260E+01
		107	SXX	-0.618115E+02	SYY	0.398291E+01	SXY -0.691500E+01
		50	SXX	0.196393E+01	SYY	-0.755523E+01	SXY -0.189490E+02
		44	SXX	0.576717E+02	SYY	0.679618E+01	SXY -0.189163E+02
		106	SXX	-0.896766E+02	SYY	0.331207E+00	SXY -0.190483E+01
		86	SXX	-0.298655E+02	SYY	-0.177497E+01	SXY -0.134930E+02
		47	SXX	0.298177E+02	SYY	-0.379538E+00	SXY -0.138856E+02
		84	SXX	-0.298655E+02	SYY	0.179012E+01	SXY -0.135198E+02
119	NODE	107	SXX	-0.814654E+02	SYY	-0.191327E+01	SXY -0.668060E+01
		109	SXX	-0.258974E+02	SYY	-0.124112E+01	SXY -0.680744E+01
		56	SXX	-0.965083E+01	SYY	-0.274577E+01	SXY -0.184686E+02
		50	SXX	0.459205E+02	SYY	0.563174E+01	SXY -0.186407E+02
		108	SXX	-0.536420E+02	SYY	-0.144524E+01	SXY -0.153497E+01
		88	SXX	-0.180369E+02	SYY	-0.207088E+01	SXY -0.137979E+02
		53	SXX	0.181884E+02	SYY	0.162179E+01	SXY -0.133400E+02
		86	SXX	-0.180388E+02	SYY	0.177303E+01	SXY -0.138328E+02
120	NODE	109	SXX	-0.425990E+02	SYY	-0.625160E+01	SXY -0.130910E+02
		111	SXX	0.134920E+02	SYY	-0.554129E+01	SXY -0.218087E+01
		62	SXX	-0.254643E+02	SYY	-0.428237E+02	SXY -0.248615E+02
		56	SXX	0.306254E+02	SYY	0.933708E+01	SXY -0.145498E+02
		110	SXX	-0.106188E+02	SYY	0.722050E+01	SXY -0.300788E+01
		90	SXX	-0.115445E+02	SYY	-0.258500E+02	SXY -0.125927E+02
		59	SXX	0.652709E+01	SYY	-0.358650E+01	SXY -0.150730E+02
		88	SXX	-0.115468E+02	SYY	-0.123842E+00	SXY -0.129017E+02

LOADING - 1 POINT LOAD AT END OF BEAM

MEMBER FORCES LOADING - 1

MEMBER	JOINT	FORCE AXIAL	FORCE SHEAR Y	FORCE SHEAR Z	MOMENT TORSIONAL	MOMENT BENDING Y	MOMENT BENDING Z

SUPPORT JOINT REACTION LOADS LOADING - 1

JOINT		FORCE X FORCE	FORCE Y FORCE	FORCE Z FORCE	MOMENT X MOMENT	MOMENT Y MOMENT	MOMENT Z MOMENT
1	GLOBAL	-222.550934	-70.3363037	-1.2699776	2.2156973	-9.0676746	
2	GLOBAL	-896.900635	-0.0000828	103.191833	-0.0000071	-20.9762421	-0.0000449
3	GLOBAL	-222.550781	70.3362274	-1.2697506	-2.2158108	-9.0681648	
70	GLOBAL	691.831787	0.0000568	-238.122589	0.0000052		0.0003745
91	GLOBAL	650.170410	0.0001047	237.469559	-0.0000848		0.0003825

RESULTANT JOINT DISPLACEMENTS - SUPPORTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
1	GLOBAL	0.0	0.0	0.0	0.0	0.0	
2	GLOBAL	0.0	0.0	0.0	0.0	0.0	0.0
3	GLOBAL	0.0	0.0	0.0	0.0	0.0	
70	GLOBAL	0.0	0.0	0.0	0.0		0.0
91	GLOBAL	0.0	0.0	0.0	0.0		0.0

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
4	GLOBAL	0.0000178	0.0000054	-0.0000182	-0.0000015	0.0000078	
7	GLOBAL	0.0000364	0.0000051	-0.0000783	-0.0000022	0.0000159	
10	GLOBAL	0.0000533	0.0000052	-0.0001755	-0.0000020	0.0000228	
13	GLOBAL	0.0000701	0.0000048	-0.0003065	-0.0000019	0.0000295	

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT X DISP	Y DISP	Z DISP	ROTATION X ROT	Y ROT	Z ROT
16	GLOBAL	0.0000851	0.0000045	-0.0004699	-0.0000018	0.0000358	
19	GLOBAL	0.0001000	0.0000042	-0.0006633	-0.0000017	0.0000415	
22	GLOBAL	0.0001130	0.0000039	-0.0008844	-0.0000016	0.0000469	
25	GLOBAL	0.0001259	0.0000036	-0.0011314	-0.0000014	0.0000519	
28	GLOBAL	0.0001369	0.0000033	-0.0014023	-0.0000013	0.0000564	
31	GLOBAL	0.0001478	0.0000030	-0.0016952	-0.0000012	0.0000606	
34	GLOBAL	0.0001568	0.0000027	-0.0020080	-0.0000011	0.0000644	
37	GLOBAL	0.0001658	0.0000024	-0.0023386	-0.0000010	0.0000678	
40	GLOBAL	0.0001728	0.0000021	-0.0026852	-0.0000008	0.0000708	
43	GLOBAL	0.0001797	0.0000018	-0.0030458	-0.0000007	0.0000734	
46	GLOBAL	0.0001847	0.0000015	-0.0034184	-0.0000006	0.0000756	
49	GLOBAL	0.0001896	0.0000012	-0.0038008	-0.0000005	0.0000773	
52	GLOBAL	0.0001927	0.0000009	-0.0041911	-0.0000004	0.0000787	
55	GLOBAL	0.0001957	0.0000006	-0.0045871	-0.0000003	0.0000797	
58	GLOBAL	0.0001968	0.0000004	-0.0049878	-0.0000002	0.0000806	
61	GLOBAL	0.0001977	-0.0000003	-0.0053925	-0.0000004	0.0000811	
5	GLOBAL	0.0000199	0.0000000	-0.0000209	-0.0000000	0.0000085	0.0000000
8	GLOBAL	0.0000368	0.0000000	-0.0000840	-0.0000000	0.0000161	-0.0000000
11	GLOBAL	0.0000564	0.0000000	-0.0001805	-0.0000000	0.0000227	0.0000000
14	GLOBAL	0.0000710	0.0000000	-0.0003112	-0.0000000	0.0000295	0.0000000
17	GLOBAL	0.0000880	0.0000000	-0.0004745	-0.0000000	0.0000357	0.0000000
20	GLOBAL	0.0001008	0.0000000	-0.0006675	-0.0000000	0.0000414	0.0000000
23	GLOBAL	0.0001159	0.0000000	-0.0008883	-0.0000000	0.0000468	0.0000000
26	GLOBAL	0.0001267	0.0000000	-0.0011350	-0.0000000	0.0000518	0.0000000
29	GLOBAL	0.0001398	0.0000000	-0.0014056	-0.0000000	0.0000564	0.0000000
32	GLOBAL	0.0001486	0.0000000	-0.0016982	-0.0000000	0.0000606	-0.0000000
35	GLOBAL	0.0001597	0.0000000	-0.0020106	-0.0000000	0.0000644	-0.0000000
38	GLOBAL	0.0001666	0.0000000	-0.0023410	-0.0000000	0.0000677	-0.0000000
41	GLOBAL	0.0001757	0.0000000	-0.0026873	-0.0000000	0.0000707	-0.0000000
44	GLOBAL	0.0001805	0.0000000	-0.0030476	-0.0000000	0.0000733	-0.0000000
47	GLOBAL	0.0001876	0.0000000	-0.0034198	-0.0000000	0.0000755	-0.0000000
50	GLOBAL	0.0001905	0.0000000	-0.0038021	-0.0000000	0.0000773	0.0000000
53	GLOBAL	0.0001956	0.0000000	-0.0041921	-0.0000000	0.0000787	0.0000000
56	GLOBAL	0.0001964	0.0000000	-0.0045881	-0.0000000	0.0000796	-0.0000000
59	GLOBAL	0.0001993	-0.0000000	-0.0049882	-0.0000000	0.0000806	-0.0000000
62	GLOBAL	0.0001989	-0.0000000	-0.0053938	-0.0000000	0.0000814	0.0000000
6	GLOBAL	0.0000178	-0.0000054	-0.0000182	0.0000015	0.0000078	
9	GLOBAL	0.0000364	-0.0000051	-0.0000783	0.0000022	0.0000159	
12	GLOBAL	0.0000533	-0.0000052	-0.0001755	0.0000020	0.0000228	
15	GLOBAL	0.0000701	-0.0000048	-0.0003065	0.0000019	0.0000295	
18	GLOBAL	0.0000851	-0.0000045	-0.0004700	0.0000018	0.0000358	
21	GLOBAL	0.0001000	-0.0000042	-0.0006633	0.0000017	0.0000415	
24	GLOBAL	0.0001130	-0.0000039	-0.0008845	0.0000015	0.0000469	
27	GLOBAL	0.0001259	-0.0000036	-0.0011314	0.0000014	0.0000519	

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT X DISP	DISPLACEMENT Y DISP	DISPLACEMENT Z DISP	ROTATION X ROT	ROTATION Y ROT	ROTATION Z ROT
30	GLOBAL	0.0001369	-0.0000033	-0.0014024	0.0000013	0.0000564	
33	GLOBAL	0.0001478	-0.0000030	-0.0016952	0.0000012	0.0000606	
36	GLOBAL	0.0001568	-0.0000027	-0.0020080	0.0000011	0.0000644	
39	GLOBAL	0.0001658	-0.0000024	-0.0023386	0.0000010	0.0000678	
42	GLOBAL	0.0001728	-0.0000021	-0.0026853	0.0000008	0.0000708	
45	GLOBAL	0.0001797	-0.0000018	-0.0030458	0.0000007	0.0000734	
48	GLOBAL	0.0001847	-0.0000015	-0.0034184	0.0000006	0.0000756	
51	GLOBAL	0.0001896	-0.0000012	-0.0038008	0.0000005	0.0000773	
54	GLOBAL	0.0001927	-0.0000009	-0.0041911	0.0000004	0.0000787	
57	GLOBAL	0.0001957	-0.0000006	-0.0045871	0.0000003	0.0000797	
60	GLOBAL	0.0001968	-0.0000004	-0.0049879	0.0000002	0.0000806	
63	GLOBAL	0.0001977	0.0000003	-0.0053925	0.0000004	0.0000811	
71	GLOBAL		-0.0000000		-0.0000000		-0.0000000
72	GLOBAL	-0.0000361	-0.0000000	-0.0000822	-0.0000000		-0.0000000
73	GLOBAL		-0.0000000		-0.0000000		-0.0000000
74	GLOBAL	-0.0000702	-0.0000000	-0.0003117	-0.0000000		-0.0000000
75	GLOBAL		-0.0000000		-0.0000000		-0.0000000
76	GLOBAL	-0.0001000	-0.0000000	-0.0006674	-0.0000000		-0.0000000
77	GLOBAL		-0.0000000		-0.0000000		-0.0000000
78	GLOBAL	-0.0001259	-0.0000000	-0.0011350	-0.0000000		-0.0000000
79	GLOBAL		-0.0000000		-0.0000000		-0.0000000
80	GLOBAL	-0.0001478	-0.0000000	-0.0016982	-0.0000000		-0.0000000
81	GLOBAL		-0.0000000		-0.0000000		-0.0000000
82	GLOBAL	-0.0001658	-0.0000000	-0.0023410	-0.0000000		-0.0000000
83	GLOBAL		-0.0000000		-0.0000000		0.0000000
84	GLOBAL	-0.0001797	-0.0000000	-0.0030476	-0.0000000		0.0000000
85	GLOBAL		-0.0000000		-0.0000000		0.0000000
86	GLOBAL	-0.0001897	-0.0000000	-0.0038020	-0.0000000		0.0000000
87	GLOBAL		-0.0000000		-0.0000000		0.0000000
88	GLOBAL	-0.0001957	-0.0000000	-0.0045884	-0.0000000		0.0000000
89	GLOBAL		-0.0000000		-0.0000000		0.0000000
90	GLOBAL	-0.0001982	-0.0000000	-0.0053890	-0.0000000		0.0000000
92	GLOBAL	-0.0000567	-0.0000000	-0.0000312	-0.0000000		-0.0000000
93	GLOBAL	-0.0001119	-0.0000000	-0.0000941	-0.0000000		-0.0000000
94	GLOBAL	-0.0001653	-0.0000000	-0.0001907	-0.0000000		-0.0000000
95	GLOBAL	-0.0002137	-0.0000000	-0.0003208	-0.0000000		-0.0000000
96	GLOBAL	-0.0002606	-0.0000000	-0.0004835	-0.0000000		-0.0000000
97	GLOBAL	-0.0003031	-0.0000000	-0.0006759	-0.0000000		-0.0000000
98	GLOBAL	-0.0003443	-0.0000000	-0.0008961	-0.0000000		-0.0000000
99	GLOBAL	-0.0003809	-0.0000000	-0.0011422	-0.0000000		-0.0000000
100	GLOBAL	-0.0004160	-0.0000000	-0.0014122	-0.0000000		-0.0000000
101	GLOBAL	-0.0004466	-0.0000000	-0.0017042	-0.0000000		-0.0000000
102	GLOBAL	-0.0004757	-0.0000000	-0.0020160	-0.0000000		-0.0000000
103	GLOBAL	-0.0005004	-0.0000000	-0.0023458	-0.0000000		-0.0000000

PAGE - 32

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		DISPLACEMENT			ROTATION		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
104	GLOBAL	-0.0005235	-0.0000000	-0.0026915	-0.0000000		0.0000000
105	GLOBAL	-0.0005422	-0.0000000	-0.0030512	-0.0000000		0.0000000
106	GLOBAL	-0.0005594	-0.0000000	-0.0034228	-0.0000000		0.0000000
107	GLOBAL	-0.0005721	-0.0000000	-0.0038045	-0.0000000		0.0000000
108	GLOBAL	-0.0005833	-0.0000000	-0.0041939	-0.0000000		0.0000000
109	GLOBAL	-0.0005899	-0.0000000	-0.0045892	-0.0000000		0.0000000
110	GLOBAL	-0.0005943	-0.0000000	-0.0049890	-0.0000000		0.0000000
111	GLOBAL	-0.0005941	-0.0000000	-0.0053864	-0.0000000		0.0000000

PAGE - 33

EXECUTE PROGRAM 'QQSTJTAV'

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*RESULTS OF LATEST ANALYSIS*
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PROBLEM - BEAM TITLE - T BEAM WITH SHELL ELEMENTS

ACTIVE UNITS INCH LB RAD FAHR SEC LBM

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
1	1	0.340832E+01	0.102249E+01	0.391274E+00	0.268501E-01	0.201131E+00
4	1	0.456341E+01	-0.134627E+00	0.466238E+00	-0.264258E-01	0.322866E+00
7	1	0.364626E+01	0.101037E+00	0.868199E-01	-0.801228E-01	-0.209711E+00
10	1	0.334290E+01	-0.316525E-01	-0.748653E-01	-0.474116E-01	0.720060E-01
13	1	0.326844E+01	0.432873E-02	-0.353179E-01	-0.276913E-01	0.147761E-02
16	1	0.298514E+01	0.133964E-02	-0.450124E-01	-0.377312E-01	-0.763673E-02
19	1	0.276721E+01	-0.495702E-03	-0.500092E-01	-0.312579E-01	-0.400605E-02
22	1	0.258751E+01	-0.851810E-03	-0.474059E-01	-0.286753E-01	0.256233E-02
25	1	0.239611E+01	0.825524E-04	-0.448768E-01	-0.302232E-01	0.101941E-02
28	1	0.219192E+01	0.113487E-03	-0.455075E-01	-0.311562E-01	-0.706967E-03
31	1	0.199080E+01	-0.291526E-03	-0.462412E-01	-0.308212E-01	-0.175722E-03
34	1	0.179244E+01	-0.341803E-03	-0.459805E-01	-0.306183E-01	0.303871E-03
37	1	0.159278E+01	-0.275195E-03	-0.457218E-01	-0.304995E-01	-0.142081E-03
40	1	0.139501E+01	-0.672936E-04	-0.463683E-01	-0.302517E-01	-0.563386E-03
43	1	0.120014E+01	-0.109583E-03	-0.471760E-01	-0.310797E-01	0.746824E-03
46	1	0.993579E+00	-0.859588E-03	-0.446499E-01	-0.326342E-01	0.278849E-02
49	1	0.780693E+00	0.195175E-03	-0.420932E-01	-0.340676E-01	-0.648825E-02

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
52	1	0.551943E+00	-0.995088E-02	-0.230634E-01	-0.225851E-01	0.107509E-01
55	1	0.464290E+00	0.191802E-01	-0.456741E-01	-0.141732E-01	-0.677915E-01
58	1	0.450470E+00	-0.348050E-01	0.229144E-02	-0.344826E-01	0.104060E+00
61	1	0.764332E-01	0.321914E-01	0.111717E+00	-0.509211E-01	-0.930687E-01
2	1	0.294266E+01	0.882798E+00	0.963194E-06	0.628381E-01	0.251612E-04
5	1	0.337027E+01	0.981326E+00	0.416121E-04	-0.189434E+00	-0.357421E-06
8	1	0.184806E+01	-0.258589E+00	0.465980E-04	-0.144824E+00	0.194547E-05
11	1	0.244104E+01	0.784990E-01	0.478812E-04	0.533324E-01	-0.221341E-05
14	1	0.216318E+01	0.250696E-01	0.425035E-04	-0.413978E-01	-0.267746E-05
17	1	0.197436E+01	-0.164167E-01	0.350045E-04	-0.285810E-01	-0.774662E-05
20	1	0.184059E+01	-0.133846E-01	0.300687E-04	-0.167837E-01	-0.222253E-04
23	1	0.173169E+01	0.391290E-02	0.292047E-04	-0.172480E-01	-0.193779E-04
26	1	0.159837E+01	0.355795E-02	0.244064E-04	-0.214711E-01	-0.125799E-04
29	1	0.145942E+01	-0.101387E-02	0.161488E-04	-0.212991E-01	-0.261811E-04
32	1	0.132705E+01	-0.777475E-03	0.666125E-05	-0.201874E-01	-0.290810E-05
35	1	0.119580E+01	0.332868E-03	-0.162026E-05	-0.204499E-01	-0.207320E-04
38	1	0.106172E+01	-0.636733E-03	-0.141278E-04	-0.207556E-01	-0.486154E-05
41	1	0.928482E+00	-0.897327E-03	-0.155286E-04	-0.198700E-01	-0.166526E-04
44	1	0.800354E+00	0.289940E-02	-0.257343E-04	-0.195073E-01	0.125932E-04
47	1	0.669739E+00	0.421241E-02	-0.443748E-04	-0.236870E-01	-0.121141E-04
50	1	0.506811E+00	-0.142628E-01	-0.316487E-04	-0.207841E-01	-0.459185E-04
53	1	0.419195E+00	-0.118287E-01	-0.737566E-04	-0.356590E-01	0.212913E-03

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
56	1	0.137307E+00	-0.108786E+00	-0.188544E-03	0.278046E-01	0.635778E-04
59	1	0.564003E+00	0.165180E+00	-0.175439E-03	-0.238820E-01	-0.451903E-03
62	1	-0.510350E-01	-0.279152E+00	-0.303022E-04	-0.160581E+00	-0.217169E-03
3	1	0.340858E+01	0.102257E+01	-0.391279E+00	0.267923E-01	-0.201080E+00
6	1	0.456343E+01	-0.134641E+00	-0.466151E+00	-0.264658E-01	-0.322868E+00
9	1	0.364627E+01	0.101033E+00	-0.867237E-01	-0.801507E-01	0.209708E+00
12	1	0.334289E+01	-0.316696E-01	0.749568E-01	-0.474467E-01	-0.720132E-01
15	1	0.326842E+01	0.428677E-02	0.353969E-01	-0.277380E-01	-0.148658E-02
18	1	0.298518E+01	0.128132E-02	0.450724E-01	-0.378323E-01	0.761271E-02
21	1	0.276715E+01	-0.624299E-03	0.500586E-01	-0.313878E-01	0.393842E-02
24	1	0.258742E+01	-0.972867E-03	0.474576E-01	-0.287629E-01	-0.262148E-02
27	1	0.239608E+01	-0.239909E-04	0.449194E-01	-0.303034E-01	-0.105830E-02
30	1	0.219187E+01	-0.472963E-04	0.455309E-01	-0.312537E-01	0.627197E-03
33	1	0.199083E+01	-0.328481E-03	0.462424E-01	-0.309612E-01	0.165642E-03
36	1	0.179236E+01	-0.462085E-03	0.459639E-01	-0.307858E-01	-0.367469E-03
39	1	0.159275E+01	-0.316322E-03	0.456746E-01	-0.306607E-01	0.125937E-03
42	1	0.139491E+01	-0.147194E-03	0.463242E-01	-0.303844E-01	0.511881E-03
45	1	0.120025E+01	-0.301898E-04	0.471094E-01	-0.312473E-01	-0.710817E-03
48	1	0.993537E+00	-0.938326E-03	0.445358E-01	-0.328813E-01	-0.282653E-02
51	1	0.780157E+00	-0.280738E-04	0.420228E-01	-0.340244E-01	0.634590E-02
54	1	0.553159E+00	-0.868690E-02	0.228707E-01	-0.228847E-01	-0.101137E-01

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
57	1	0.465341E+00	0.193454E-01	0.451368E-01	-0.158431E-01	0.679856E-01
60	1	0.448139E+00	-0.377462E-01	-0.280229E-02	-0.358197E-01	-0.105411E+00
63	1	0.758919E-01	0.307707E-01	-0.111807E+00	-0.511940E-01	0.924293E-01
70	1	-0.792794E-04	-0.237838E-04	0.565293E-06	0.100423E-04	0.211157E-04
71	1	-0.307710E-04	-0.785194E-05	0.378195E-04	0.768625E-05	-0.132209E-06
72	1	-0.332318E-05	-0.754030E-06	0.470139E-04	0.384749E-05	0.483320E-05
73	1	0.509934E-05	0.648576E-05	0.512243E-04	0.133720E-05	0.808446E-06
74	1	0.587390E-05	0.750224E-05	0.486029E-04	0.312814E-06	0.849881E-06
75	1	0.733948E-05	0.828745E-05	0.449504E-04	0.317762E-06	0.804974E-06
76	1	0.850897E-05	0.915276E-05	0.406973E-04	0.321896E-06	0.933718E-06
77	1	0.955820E-05	0.101796E-04	0.359159E-04	0.315393E-06	0.102015E-05
78	1	0.105307E-04	0.111820E-04	0.305948E-04	0.300741E-06	0.113568E-05
79	1	0.114526E-04	0.121698E-04	0.247679E-04	0.282475E-06	0.122445E-05
80	1	0.123136E-04	0.130572E-04	0.184761E-04	0.260864E-06	0.133266E-05
81	1	0.130983E-04	0.139041E-04	0.117532E-04	0.230463E-06	0.140053E-05
82	1	0.137681E-04	0.145839E-04	0.467311E-05	0.192229E-06	0.151367E-05
83	1	0.142444E-04	0.152043E-04	-0.273365E-05	0.140720E-06	0.153909E-05
84	1	0.145131E-04	0.154110E-04	-0.103402E-04	0.582438E-07	0.166201E-05
85	1	0.149730E-04	0.147745E-04	-0.178219E-04	-0.515144E-06	0.167995E-05
86	1	0.128174E-04	0.974910E-05	-0.227441E-04	-0.176846E-05	0.297661E-05
87	1	0.269030E-05	0.250706E-05	-0.253442E-04	-0.302198E-05	0.958861E-06
88	1	-0.665633E-05	-0.106581E-04	-0.271913E-04	-0.332086E-05	-0.228956E-05

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------
89	1	-0.809402E-05	-0.268615E-04	-0.213763E-04	-0.153649E-05	-0.403067E-05
90	1	0.207590E-05	-0.357580E-04	-0.107554E-04	0.211298E-07	-0.926154E-05
91	1	-0.168722E-03	-0.506166E-04	-0.552418E-05	0.289637E-04	0.178885E-04
92	1	-0.451853E-04	0.800668E-05	0.367767E-04	0.171955E-04	-0.533259E-06
93	1	-0.102503E-04	0.390451E-07	0.506148E-04	0.411224E-05	0.117760E-05
94	1	0.446181E-05	0.218884E-06	0.513456E-04	0.180153E-05	0.102819E-05
95	1	0.836410E-05	0.380960E-07	0.487756E-04	0.585089E-06	0.763510E-06
96	1	0.101689E-04	0.314521E-07	0.449739E-04	0.315503E-06	0.831016E-06
97	1	0.116729E-04	0.112486E-07	0.406277E-04	0.259572E-06	0.920029E-06
98	1	0.130908E-04	0.228101E-08	0.357989E-04	0.247309E-06	0.102243E-05
99	1	0.144249E-04	0.523869E-08	0.304702E-04	0.235391E-06	0.112118E-05
100	1	0.156854E-04	-0.101090E-08	0.246495E-04	0.221781E-06	0.122200E-05
101	1	0.168579E-04	0.756245E-08	0.183660E-04	0.203056E-06	0.130968E-05
102	1	0.179178E-04	-0.132559E-08	0.116554E-04	0.177466E-06	0.139845E-05
103	1	0.188121E-04	0.104474E-07	0.457789E-05	0.140872E-06	0.146811E-05
104	1	0.195001E-04	0.135969E-09	-0.279849E-05	0.734009E-07	0.153131E-05
105	1	0.198411E-04	0.150394E-07	-0.102707E-04	-0.111869E-06	0.155102E-05
106	1	0.190692E-04	-0.772638E-07	-0.172830E-04	-0.600911E-06	0.165946E-05
107	1	0.140054E-04	0.199851E-06	-0.221033E-04	-0.145051E-05	0.136364E-05
108	1	0.350092E-05	-0.270622E-06	-0.239389E-04	-0.202240E-05	0.383125E-06
109	1	-0.792626E-05	-0.618576E-06	-0.224944E-04	-0.150541E-05	-0.115038E-05

A V E R A G E N O D A L S T R E S S

//---NODE---	//---LOAD---	//------MXX------	//------MYY------	//------MXY------	//------VX------	//------VY------//
110	1	-0.129057E-04	-0.517058E-06	-0.153130E-04	0.102844E-05	-0.353102E-05
111	1	0.354348E-05	0.254701E-05	-0.621441E-05	0.297471E-05	-0.639632E-05

FINISH

Summary:

The following points should be considered when different STRUDL elements and members are combined in a RUN.

1) The finite element results are in planar coordinates and frame member results are in local coordinates.

2) The frame member results are forces and moments, while the finite element provides answers in stresses or moments and forces per unit length.

3) When a higher order element is combined with a lower order, the user should look out for the compatibility along the element interface.

4) Compatibility of displacement is always satisfied at the interface joint.

5) The user should also make sure that the different combinations of elements provide the appropriate degrees of freedom for the problem.

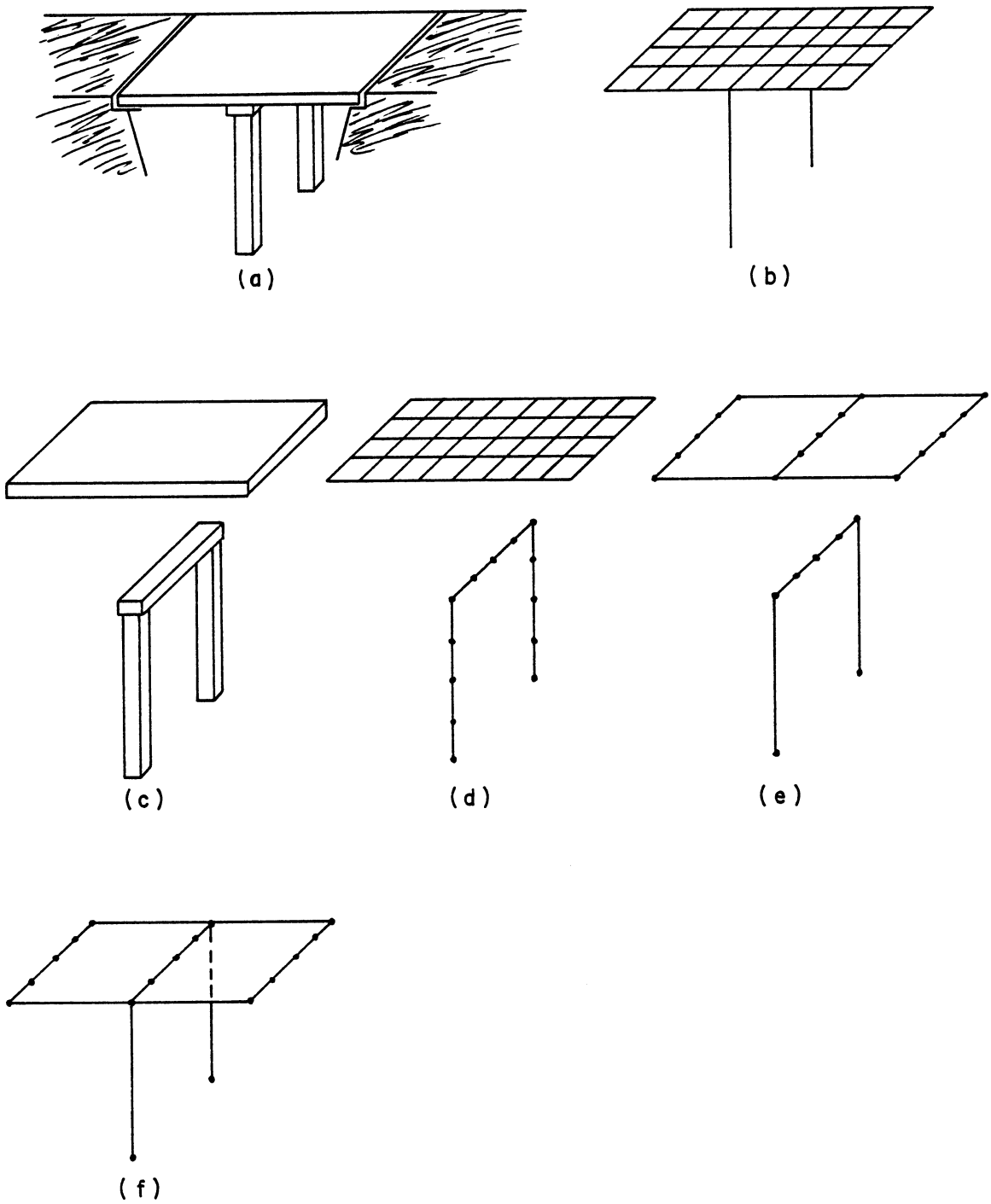
8.12.1 The Substructure or 'Super' Element.

As discussed from the previous sections, the basic finite element approach consists of assembling the whole region of the structure with a finite number of elements interconnected at their nodes. This process of building a structure from individual elements can be extended to the concept of substructuring in which a total structure is broken down into several substructures where each is defined as a 'super' element and finally, assembled as a total structure. Hence, in the substructure technique super elements instead of the basic elements are used to assemble the region of the problem.

The 'super' element is a user defined element in which the shape, the number of nodes (super nodes), the degrees of freedom per node, the stiffness, inertia and loading are all defined by the user. Essentially, each 'super' element can be seen as a very complex element which describes the behavior of an entire substructure. The stiffness and load matrices that represent the behavior of the substructure are obtained by analyzing the substructure region in the usual way, i.e., discretizing the region with basic elements, and condensing out the degrees of freedom that belong to the nonboundary nodes using the static* condensation procedure. These final stiffness and load matrices then become 'super' elements which can be used later to assemble the total structure.

Figure 8.12.1 shows how the substructure technique can be applied to a simple 2 span slab bridge.

*The static condensation is a mathematical process in which the dependent degree of freedom from the stiffness and load matrices are eliminated and expressed in terms of the independent degrees of freedom. The results of the condensation are reduced (smaller in size) stiffness and load matrices and their redefinition in terms of the independent degrees of freedom. The behavior of the model, which is represented by the stiffness and load matrices, has not been changed, just the way in which the properties are defined. For more details of the static condensation procedure, see ICES STRUDL MANUAL Appendix G.6.



Figures 8.12.1 a, b, c, d, e, f

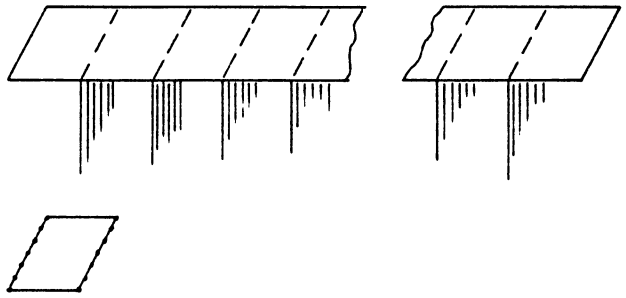
The simple 2 span slab bridge with 2 column bents is shown in Figure a. In Figure b, a conventional finite element mesh layout is shown. The procedure for the substructuring technique is illustrated in Figures c, d, e, and f. In Figure c, the individual structure components or substructures for this bridge are shown. For this case the superstructure and the bent are chosen to be the components. In order to define or to create the super element properties for each component (substructure), a conventional discretization using the basic finite elements is applied to each substructure as shown in Figure d, and in Figure e the final condensed super elements for each substructure is shown. Notice all interior nonboundary nodes have been condensed out. Finally, Figure f shows how the two individual 'super' elements are assembled to represent the total structure to be analyzed. For this particular case, the results from Figures b and f are identical. The reason is that the super element properties (Figure e) are computed using the same mesh layout and basic element (compare Figures b and d). Although the results of Figures f and b are the same, the size of the problems is not. In Figure f, 17 nodes are used while Figure b has 53 nodes.

The basic difference between the conventional finite element and the super element is that the latter breaks up the total problem into several smaller problems. This procedure can be very useful for:

1) a very large complex problem where the total number of elements needed to provide reasonable accuracy is too large for the computer to execute in a single run. An example of this is a 20 span bridge with 6 columns per bent. If each span requires 200 nodes and each node has 6 degrees of freedom (DOF), the final system of equations to be solved would be in the order of 24,000 for a single run. (200 nodes/span x 20 span x 6 DOF/nodes = 24,000 DOF)

The use of the substructure technique can reduce this problem into many super elements. With the nonboundary nodes of each super element condensed out, the total problem can be reduced to a manageable size for the computer.

2) cases where the super element which defines a portion of the total structure can be used repeatedly. In the example of the 20 span bridge, if all spans have the same geometry, orientation and loading, then a super element which represents any span could be used for all other spans.



This typical super element can be used repeatedly for all 20 spans of this problem.

This process will eliminate the cost of reformulating the stiffness and load matrices of the substructure which has the same geometrical and loading characteristics.

8.12.2 Procedure for Analyzing Structure Using the STRUDL 'Super' Element Capabilities:

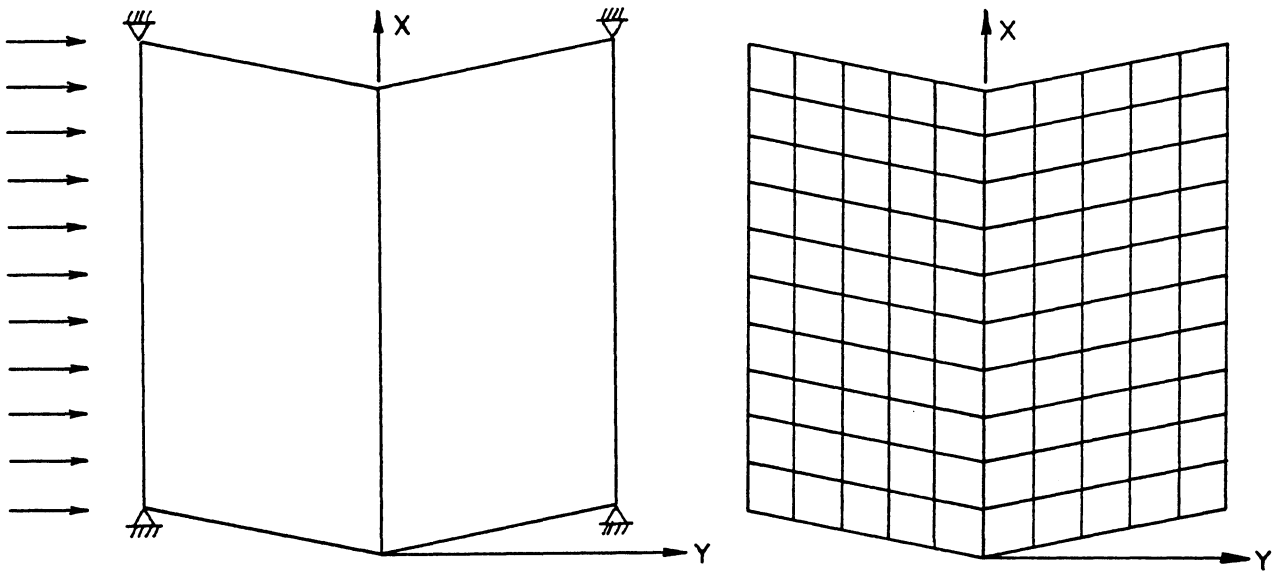
The use of STRUDL 'super' element generally requires three steps. These are:

1) Definition of all super elements (Local Problems)
2) Analysis of the structure with all 'super' elements incorporated (Global Problem)
3) Calculation of the internal results for each 'super' element.

In the first step, local problems, the user has to define the substructures of the problem, create their corresponding super elements' properties and store this information in a data set that can be used later. As explained earlier, the definition of the super element properties is done by discretizing the substructure region with basic elements and condensing the nonboundary nodes with the static condensation procedure. The final condensed stiffness and load matrices of the substructure are the super element properties that will be used in the second step. This is the global problem in which the total structure is assembled with super elements interconnected at their 'super' nodes. The properties of each super element are input from the user data set, the boundary conditions of the total structure are introduced and the results at the super nodes are determined. The third and last step deals with the determination of internal results for each super element. Up to this point, only the results at the super nodes (i.e., the boundary nodes) are known. In order to determine the internal results of each super element, the local models presented in step one are reanalyzed using the super node displacements as their loading.

The detailed description of each of these steps will be illustrated with the folded plate problem presented in Section 8.10.2. Suppose that the 100 elements used for the analysis in Section 8.10.2 were too large for the computer and the 'super' element method is used instead.

Figure 8.12.2



a) Folded plate simply supported at the corners subjected to wind load on one side

b) The finite element mesh layout used in Section 8.10.2

Each plate will be treated as a substructure and all interior nonboundary nodes are condensed out. The left hand side plate with the applied wind load is converted into a 'super' element named 'EL1' and the right hand side plate is converted into another 'super' element named 'EL2.' See Figures 8.12.3. Once both 'super' elements, 'EL1' and 'EL2' are defined and the results are stored, they can be used to solve the entire folded plate as shown in Figure 8.12.4. The numbering of the node in this figure (for the global problem) is arbitrary and defined by the user.

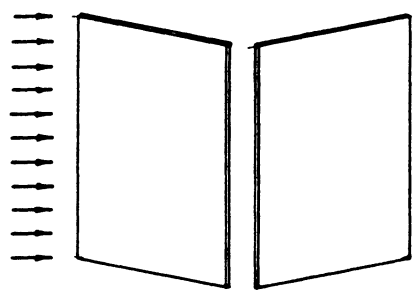
Let's follow the steps outlined previously in this section.

8.12.2.1 Definition of 'Super' Element (Local Problem)

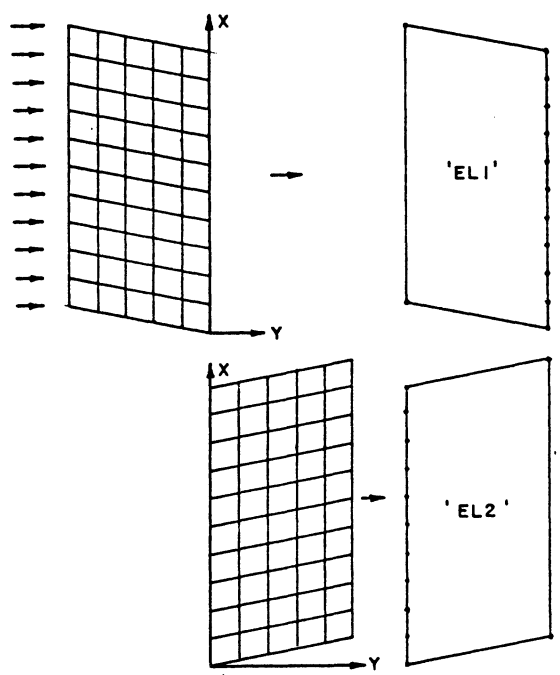
Again, this step deals with the selection of the substructures, creates the super element properties and stores this information in a data set.

To make a substructure into a super element the substructure is discretized with basic elements, the stiffness and load matrices are assembled, the super nodes are selected, the matrices are condensed and finally the condensed matrices (i.e., the super element properties) are stored in a partitioned data set to be used later as input to the global problem.

Figure 8.12.3



a) The substructure components of the folded plate



b) The left hand side plate with the wind load is converted into a 'super' element 'EL1'

c) The right hand side plate is converted into a super element 'EL2'

10

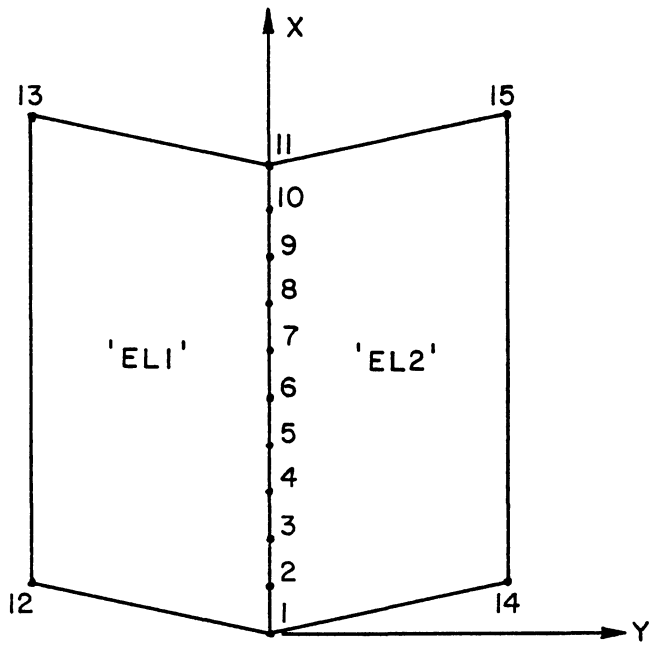
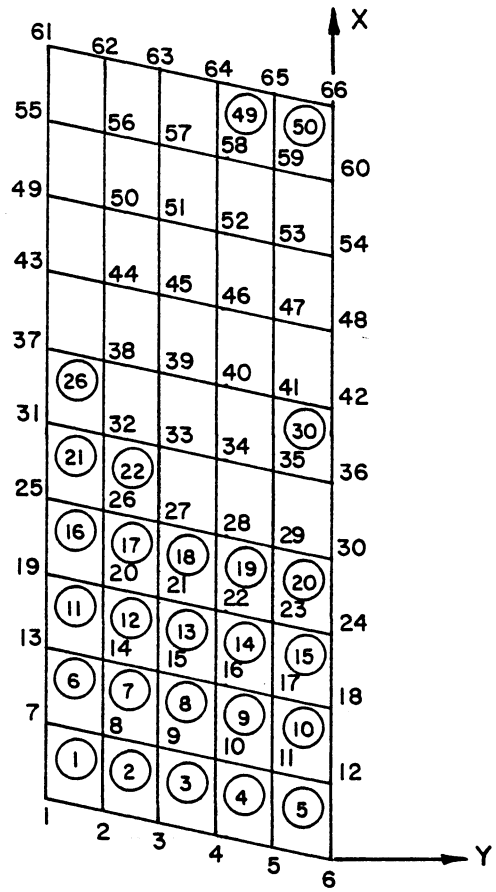


Figure 8.12.4

As shown in Figure 8.12.3a, the components of the folded plate are the left and right hand side plate.

8.12.2.1.a) For the Left Hand Side Plate:

The following mesh layout and node numbering is used.



i) The type of mathematical model selection, location of joints, type of element, element incidences, material properties and loadings are all defined with the normal STRUDL commands discussed in the previous sections. The major difference is that all joints in this local problem which defines a super element must be free joints. Hence, no joint can be defined as a support or released joint.

The following STRUDL commands are used to describe the mesh layout, material properties, types of elements, loading and data check.

```
STRUDL 'SUPL' 'SUPER ELEMENT FOR THE LEFT PLATE'

$ DEFINE THE TYPE OF STRUCTURAL PROBLEM BEFORE THE

$ ELEMENT INCIDENCES

UNIT FEET KIP DEGREE

TYPE PLATE

$ GENERATE THE JOINTS AND INCIDENCES USING OPTION 2

USE STRUCTURE GENERATOR

SPACING 11 X 1.

SPACING 6 Y ANGLE 160. YZ 1.

SHAPE DIMENSION 2 NODES 4

GENERATE PRINT OFF

END STRUCTURE GENERATOR

$ DEFINE ELEMENT PROPERTIES

ELEMENT PROPERTIES

1 TO 50 TYPE 'PBSQ2' THICKNESS 0.5

CONSTANTS

E 4320000. ALL

POISSON 0.3 ALL

G 1660000. ALL

$ INPUT LOADING

LOADING 1 'SIDE WIND LOAD'

ELEMENT 1 TO 50 LOAD SURFACE FORCE GLOBAL PY .15

$ INPUT DATA

PRINT STRUCTURAL DATA
```

ii) To form the stiffness and load matrices for this substructure the ASSEMBLE command is used. This command is explained in Section 8.1 of the STRUDL user manual.

The syntax of the command is

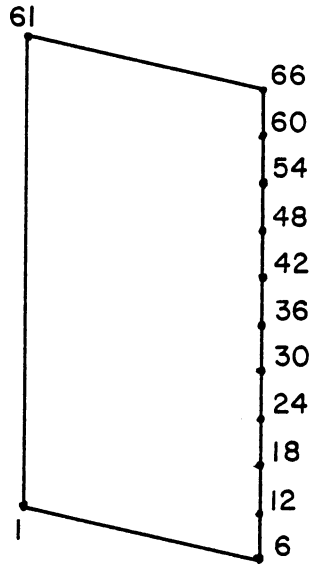
ASSEMBLE .....

The appropriate assemble option must be chosen by the user. The table shown below presents the matrix formed and the corresponding STRUDL assemble option used.

Matrix formed	Assemble option
Stiffness only	Assemble for Dynamics
Stiffness and Load	Assemble for Statics
Stiffness and Mass	Assemble for Dynamics
Stiffness, Mass and Load	Assemble for Statics Dynamics

For this case both stiffness and load matrices are needed and the option of ASSEMBLE FOR STATICS is used.

iii) After the matrices are formed then the 'super' nodes or the independent nodes and also the degrees of freedom per node are defined using the STRUDL command of INDEPENDENT JOINTS of pp. 10.1 of the STRUDL user manual.



For this case the boundary nodes that must be included are shown above. The nodes 6, 12, 18, 24, 30, 36, 42, 48, 54, 60 and 66 are the nodes where connection to the right hand plate would take place. The nodes 1 and 61 are the nodes where the simple support conditions are present. All six degrees of freedom must exist per node since the use of 'PBSQ2' as the basic element contains these degrees of freedom.

The following STRUDL commands are used.

```
$ SELECT THE SUPER NODES (THE INDEPENDENT DEGREE OF
$ FREEDOM)
$ PP 10.1
INDEPENDENT JOINT
1 61 6 TO 66 BY 6 DISP ALL ROTATION ALL .
```

iv) After the stiffness and load matrices are assembled, and the independent joints (super nodes) are selected, then the matrices are ready to be condensed.

The STRUDL command CONDENSE discussed in pp. 10.3 of the STRUDL user manual is used. The options of CONDENSE STATICS, CONDENSE DYNAMICS OR CONDENSE STATICS DYNAMICS must be the same as used in the ASSEMBLE command.

Hence, for this case the option of

CONDENSE STATICS

is used since ASSEMBLE STATICS was used to form the matrices.

v) The condensed stiffness and load matrices of previous steps represent the properties of the 'super' element for the left hand plate substructure. To be able to use these properties for the global problem, they must be stored first. The STRUDL command of WRITE UNIT 8 SUPER PROPERTIES FILE 'NAME' (PRINT)
(Element) (node list)

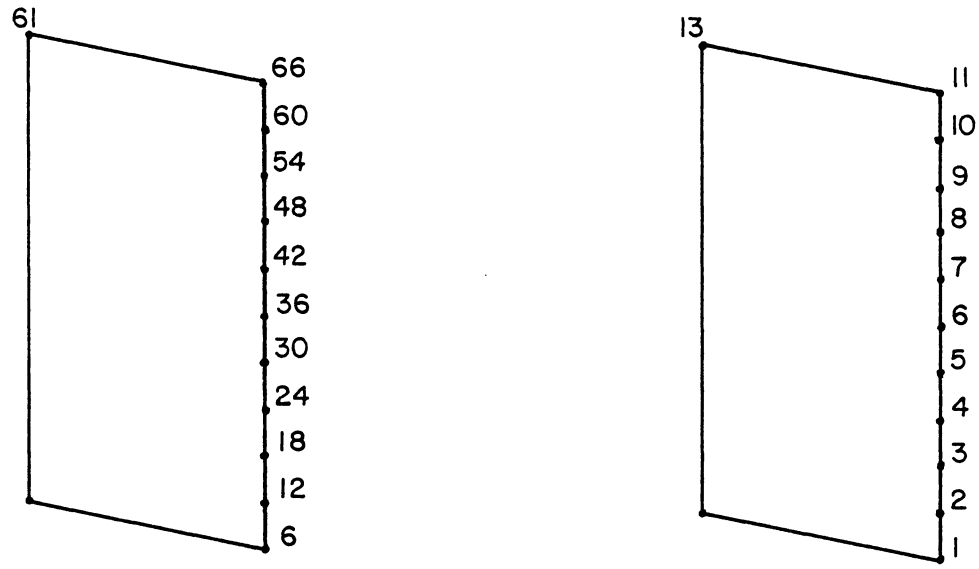
as discussed in pp. G.44 of STRUDL user manual appendix is used.

The use of the STRUDL command WRITE UNIT ..... will store the matrices together with a set of appropriate generated STRUDL commands into a partitioned data set that can be recalled later in the global problem with the INCLUDE command.

The node list of this WRITE command corresponds to the nodes of the global problem. Hence, before using this command, the user must already have the mesh layout and node numbering of the global problem. For this problem, the mesh layout and node numbering shown in Figure 8.12.4 is used.

The order of occurrence of these nodes on the list must be the same order as was created in the local problem.

Figure 8.12.5



local problem
node numbering

global problem
node numbering

The STRUDL commands used for this particular case are

```
$ WRITE THE CONDENSED STIFFNESS AND LOAD MATRICES INTO
$ A DISK
$ TO BE RECALLED LATER WITH THE INCLUDE COMMAND.
$ PP G.44
WRITE UNIT 8 SUPER PROP FILE 'SUPL' PRINT
'EL1' 12 1 2 3 4 5 6 7 8 9 10 13 11.
```

So, for the left hand side plate, super element 'EL1', the node list is 12 1 2 3 4 5 6 7 8 9 10 13 11. These node numbers correspond to the node numbering of the global problem and not the local problem.

The order of occurrence of these numbers must be considered carefully. Note that it is not 1,2,3,.....11,12,13. The order of these global nodes as they appear on the list must be in the same order as the corresponding local nodes were created in the local problem.

As shown from Figure 8.12.5, local node number 1 corresponds to global node number 12, and so on. The table shows the local boundary nodes and their corresponding global node numbers, and also the order in which they were created.

Local	1	6	12	18	24	30	36	42	48	54	60	61	66
Global	12	1	2	3	4	5	6	7	8	9	10	13	11

In this particular local problem, the nodes were generated from 1 to 66 in an incremental fashion. However, this is not always true and is user defined. Generally, the order in which the nodes are created can be determined, since they are in the same order as they appear in the PRINT STRUCTURAL DATA command.

The following information will be stored in the member 'SUPL' of the partitioned data set when the STRUDL command

```
WRITE UNIT 8 SUPER PROP FILE 'SUPL' PRINT
'EL1' 12 1 2 3 4 5 6 7 8 9 10 13 11
```

is used.

```
UNITS INCH LBF MUG RAD
 ELEMENT INCIDENCES
'EL1      '          -
'12       ' '1       ' '2       ' '3       ' '4       ' '5       '  -
'6        ' '7       ' '8       ' '9       ' '10      ' '13      '  -
'11       '
ELEMENT PROPERTIES
'EL1      ' -
TYPE 'SUPER' STI MAT GLO NOD   13 NDF 6 DISPL X Y Z ROTAT X Y Z
SUBMATRIX   1   1
 4.24150096283194E+07   1.90661248436030E+07  -6.93947629442010E+06 -
 6.31807292721142E+01  -4.32676636115698E+01   1.57480903840585E+01
 1.90661248436030E+07   4.44161106353032E+07  -1.58621146528070E+07 -
 4.43580455479389E+06  -2.47010624581247E+06   8.99044264753941E+05
-6.93947629442010E+06  -1.58621146528070E+07   6.60847939615896E+06 -
 1.21871073029192E+07  -6.78649442944686E+06   2.47007953784817E+06
 6.31807292721142E+01   4.43580455479389E+06   1.21871073029192E+07 -
 5.01025568050124E+08  -5.08934092633937E+07   1.85236883607752E+07
-4.32676636115698E+01  -2.47010624581247E+06  -6.78649442944686E+06 -
-5.08934092633937E+07   3.64135244375757E+08  -1.32534134089712E+08
 1.57480903840585E+01   8.99044264753941E+05   2.47007953784817E+06 -
 1.85236883607752E+07  -1.32534134089712E+08   4.82386790018730E+07

SUBMATRIX   2   1
-3.87850826159702E+06   2.29223823472112E+06  -8.34304673146524E+05 -
-1.69237190044551E+01  -7.14197742596841E+00   2.59945550623652E+00
 7.49879314762096E+06  -7.72338632634570E+06   2.73525614789504E+06 -
-2.34967684973689E+06  -1.37403223821401E+06   5.00106078318222E+05
-2.72933207382834E+06   2.73525104133831E+06  -1.20385950723648E+06 -
-6.45580709353009E+06  -3.77518895028886E+06   1.37405432580217E+06
-8.28095901057157E+00   1.68854924069470E+06   4.63899918183598E+06 -
 7.65985546411572E+07   1.15850844900202E+07  -4.21661535764505E+06
-2.02330119077564E+00   4.37115022961235E+05   1.20090434483828E+06 -
 1.82961473029174E+07   1.64438184127083E+06  -5.98505919665980E+05
 7.36418476819853E-01  -1.59096592083609E+05  -4.37092707064747E+05 -
-6.65924165496777E+06  -5.98508620486711E+05   2.17832781157280E+05

SUBMATRIX   13  12
-6.56520143459180E+05  -1.15622398914833E+06   4.20829973267446E+05 -
-5.26563334154304E-01   2.47705744379877E+00  -9.01568552862160E-01
-6.28790764832187E+06  -5.82704603173161E+06   2.02592799649544E+06 -
-2.08073874761884E+06   1.02888564199702E+06  -3.74482611214400E+05
 2.28860805501205E+06   2.02592152807394E+06  -9.98213972168154E+05 -
-5.71688550332548E+06   2.82688968572842E+06  -1.02890057741759E+06
-9.88527057973093E+00   1.81781378344437E+06   4.99408188575067E+06 -
 7.75018210233082E+07  -1.20901576893646E+07   4.40044921660733E+06
 1.22557765732569E+00  -4.60028946786850E+05  -1.26386378666168E+06 -
-1.41307149540543E+07  -1.92382459007949E+06   7.00211844441000E+05
-4.46083373809531E-01   1.67436615421284E+05   4.60008172000244E+05 -
 5.14315760447988E+06   7.00202867774615E+05  -2.54885379329304E+05
```

```
SUBMATRIX   13  13
 1.13350907629701E+08   3.64945192113988E+06  -1.32828925585599E+06 -
-2.01763167024265E+00  -2.74000745564910E-01   9.97285221498931E-02
 3.64945192113988E+06   6.61447844324800E+07  -1.42641273966663E+07 -
-1.27176613019009E+07   4.92950737845678E+07  -1.79419088347234E+07
-1.32828925585599E+06  -1.42641273966663E+07   3.21460608768698E+07 -
-3.49414287597021E+07   1.35437293196247E+08  -4.92950589336199E+07
-2.01763167024265E+00  -1.27176613019009E+07  -3.49414287597021E+07 -
 6.48707946545562E+08  -1.34865067104031E+08   4.90867809738043E+07
-2.74000745564910E-01   4.92950737845678E+07   1.35437293196247E+08 -
-1.34865067104031E+08   1.21363189105626E+09  -4.41725002572676E+08
 9.97285221498931E-02  -1.79419088347234E+07  -4.92950589336199E+07 -
 4.90867809738043E+07  -4.41725002572676E+08   1.60774843663015E+08

CHANGES
 LOAD  '1        '
  ADDITIONS & JOINT LOAD
'12       ' -
     FOR X  1.4042315902E+02 Y  5.8602653452E+02 Z  2.7036409497E+02 -
     MOM X  1.7208755190E+03 Y -4.4827266960E+03 Z  1.6315771603E+03
'1        ' -
     FOR X -1.2919279740E+02 Y  2.9283713250E+02 Z -1.4869514705E+02 -
     MOM X -1.5713010706E+02 Y -7.5836252778E+01 Z  2.7602116475E+01
'2        ' -
     FOR X -8.3545049546E+01 Y  5.5368510194E+02 Z -5.5430734057E+01 -
     MOM X -1.6506439130E+03 Y  4.0608788262E+01 Z -1.4780249737E+01
'3        ' -
     FOR X -7.5208293613E+01 Y  6.0754927676E+02 Z -3.1318930519E+01 -
     MOM X -2.5556014314E+03 Y  3.2657355664E+01 Z -1.1886134695E+01
'4        ' -
     FOR X -5.2186486359E+01 Y  6.5244558681E+02 Z -1.8413968278E+01 -
     MOM X -3.2180752205E+03 Y  2.4737056290E+01 Z -9.0033813031E+00
'5        ' -
     FOR X -2.4827948273E+01 Y  6.8193062571E+02 Z -8.1422689732E+00 -
     MOM X -3.6558194398E+03 Y  3.4042004773E+01 Z -1.2390108124E+01
'6        ' -
     FOR X  2.8505059663E+00 Y  6.9293393029E+02 Z -3.8322675658E+00 -
     MOM X -3.8211052575E+03 Y  4.0371161552E+01 Z -1.4693745844E+01
'7        ' -
     FOR X  2.9921816398E+01 Y  6.8520019514E+02 Z -6.0550785479E+00 -
     MOM X -3.6979224104E+03 Y  4.0794782884E+01 Z -1.4847950738E+01
'8        ' -
     FOR X  5.6933722488E+01 Y  6.5912138359E+02 Z -1.3476383061E+01 -
     MOM X -3.3057357728E+03 Y  3.6280339393E+01 Z -1.3204846499E+01
'9        ' -
     FOR X  8.3841733715E+01 Y  6.1652109573E+02 Z -2.5396856467E+01 -
     MOM X -2.6852036351E+03 Y  2.9509442297E+01 Z -1.0740454768E+01
'10       ' -
     FOR X  1.0774718166E+02 Y  5.6800085392E+02 Z -5.3248727502E+01 -
     MOM X -1.8397063440E+03 Y  2.7978006737E+01 Z -1.0183059088E+01
'13       ' -
     FOR X -1.8969702735E+02 Y  5.7708629451E+02 Z  2.5269734027E+02 -
     MOM X  1.5135878481E+03 Y  3.9052431918E+03 Z -1.4213896396E+03
```

```
'11      ' -
     FOR X  1.3293948329E+02 Y  3.2665343925E+02 Z -1.5905132408E+02 -
     MOM X -2.4234476908E+02 Y  1.3760060443E+02 Z -5.0082370430E+01

***STRUDL INFORMATION - FILE SUPL     IS STORED.
```

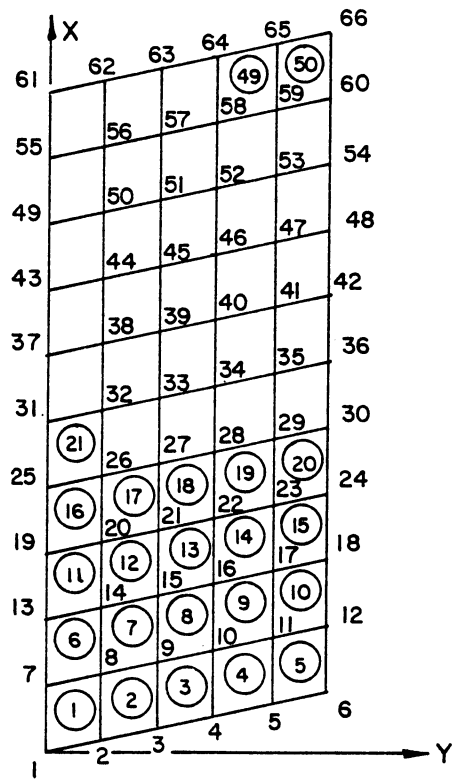
The first line is the UNIT command which specifies the units of the properties to be input.

The next line generated is the ELEMENT INCIDENCE command. The node list specified in the WRITE command is used to define the super element 'EL1' incidences. In this case 'EL1' contains a total of 13 'super' nodes.

After the ELEMENT INCIDENCES, the STRUDL command of ELEMENT PROPERTIES is generated. The element 'EL1' in this case is declared to be of TYPE 'SUPER' and the stiffness matrix in global coordinates would follow (STI MAT GLO). In the same line NOD 13 NDF 6 DISPL XYZ ROTAT XYZ specifies that the stiffness matrix consists of a 13x13 submatrix and each submatrix is 6x6 with degree of freedom of displacement and rotation in the x y and z directions. After the stiffness matrix properties, the condensed joint load properties follow. The command CHANGES is generated first. This is included because it is expected these properties will be used in the subsequent STRUDL analysis (Step 2, global problem) where other loads would be given as well. After this the load matrix is generated.

8.12.2.1.b) For the Right Hand Side Plate

The following mesh layout is used:



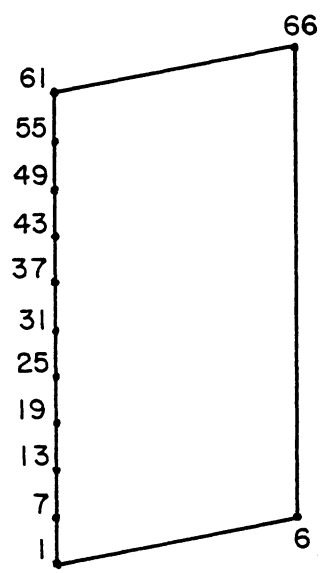
i) The following STRUDL commands were used to generate the joint locations, element properties, type of element and a data check.

```
STRUDL 'SUPR' 'SUPER ELEMENT FOR THE RIGHT PLATE'
$ DEFINE THE TYPE OF STRUCTURAL PROBLEM BEFORE THE
$ ELEMENT INCIDENCES
UNIT FEET KIP DEGREE
TYPE PLATE
$ GENERATE THE JOINT AND INCIDENCES USING OPTION 2
USE STRUCTURE GENERATOR
SPACING 11 X 1.
SPACING 6 Y ANGLE 20. ZY 1.
SHAPE DIMENSION 2 NODES 4
GENERATE PRINT OFF
END STRUCTURE GENERATOR
$ DEFINE ELEMENT PROPERTIES
```

```
ELEMENT PROPERTIES
1 TO 50 TYPE 'PBSQ2' THICKNESS 0.5
CONSTANTS
E 4320000. ALL
POISSON 0.3 ALL
G 1660000. ALL
$ CHECK INPUT DATA
PRINT STRUCTURAL DATA
```

ii) ASSEMBLE FOR DYNAMICS option was used since only the stiffness matrix was needed. (No external load was applied to the substructure; hence, no load matrix needs to be assembled.)

iii) The super nodes are as shown below.



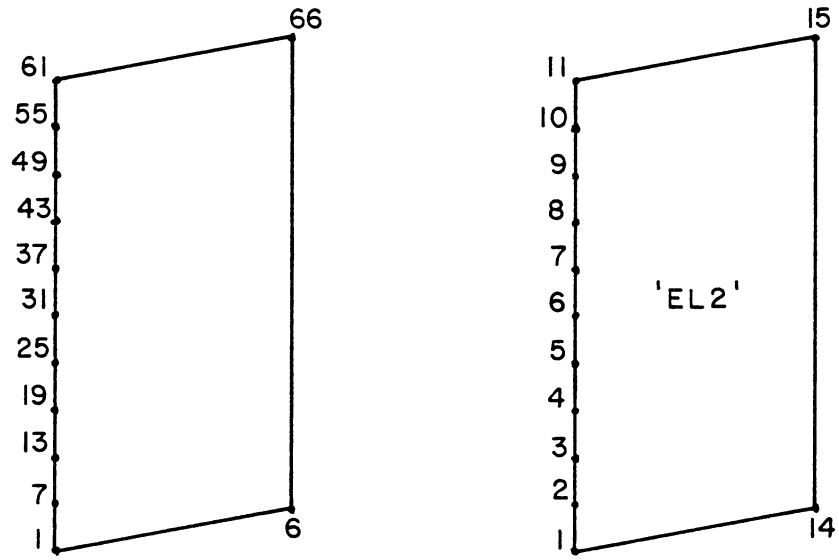
Hence, the following STRUDL command will select the super nodes and their degree of freedom.

```
$ SELECT THE SUPER NODES (THE INDEPENDENT DEGREES OF
$ FREEDOM)
$ PP 10.1
INDEPENDENT JOINT
6 66 1 TO 61 BY 6 DISP ALL ROTATION ALL
```

iv) To condense the stiffness matrix only, the STRUDL command CONDENSE DYNAMICS MATRIX is used.

v) To store the super element property of the right hand plate,

Figure 8.12.6



Local node numbering Global node numbering

The WRITE UNIT 8 SUPER PROP command is used.

```
$ WRITE THE CONDENSED STIFFNESS MATRIX INTO A DISK
$ TO BE RECALLED LATER WITH THE INCLUDE COMMAND.
$ PP G.44
WRITE UNIT 8 SUPER PROP FILE 'SUPR' PRINT
'EL2' 1 14 2 3 4 5 6 7 8 9 10 11 15
```

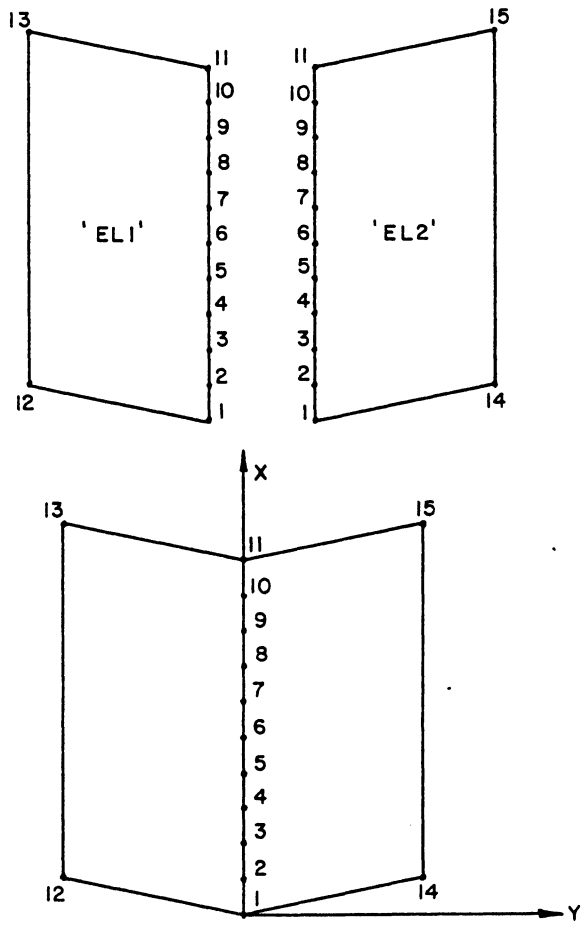
The super element name is 'EL2' and its information is stored in the member 'SUPR' of the partitioned data set.

Again, the element node list corresponds to the node numbers of the global problem and the order of these node numbers as they appear on the list must be in the same order as they were created in the local problem. For this case:

1 14 2 3 4 5 6 7 8 9 10 11 15.

8.12.2.2 Global Problem, Analysis of the Entire Structure with 'Super' Element:

This is the second step of the substructure technique. After the super elements, 'EL1' and 'EL2' are defined and their properties stored, the total structure can now be assembled and solved.



The locations of the joints in this global problem, as shown in above figures, are defined with STRUDL commands.

```
STRUDL 'GLOBAL' 'SOLUTION OF THE TOTAL FOLDED PLATE'
UNIT FEET KIP DEGREE
$ DEFINE THE JOINTS OF THE GLOBAL PROBLEM MESH
MESH COORDINATES
 1 TO 11 x  0. INCR 1. Y  0.       Z 0.
12       x  0.         Y -4.69846 Z 1.7101
13       x 10.         Y -4.69846 Z 1.7101
14       x  0.         Y  4.69846 Z 1.7101
15       x 10.         Y  4.69846 Z 1.7101
```

The type of problem in this case is not important since the element properties are input and they are already computed in the local problem step. For this case, TYPE PLATE was used since each node has 6 degrees of freedom. Notice that TYPE SPACE FRAME would have given the same results. For this case where the global problem contains only super elements, the TYPE command only serves to define the number of degrees of freedom that exist in each joint.

When a super element contains internal loads, this loading must be defined prior to the input of the super element properties. For this case, super element 'EL1' contains a loading 1, hence, this load must be defined before the 'EL1' properties are input.

```
$
$ DEFINE THE BASIC LOAD BEFORE INPUTING THE
$ SUPERELEMENT INFORMATION
$
LOAD 1 'WIND LOAD ON THE LEFT PLATE'
```

The super elements 'EL1' and 'EL2' properties are input with the INCLUDE command

```
$
$ READ IN THE SUPER ELEMENT PROPERTIES FROM THE
$ PARTITIONED DATA SET
$ INTO THE STRUDL RUN WITH THE USE OF STRUDL COMMAND
$ 'INCLUDE'
$
$ READ IN THE LEFT HAND SIDE PLATE 'SUPL'
INCLUDE 'SUPL'
$ READ IN THE RIGHT HAND SIDE PLATE 'SUPR'
INCLUDE 'SUPR'
```

Since the properties of 'EL1' are stored in the member 'SUPL,' INCLUDE 'SUPL' will input the properties of 'EL1.' Similarly, INCLUDE 'SUPR' corresponds to 'EL2.'

When INCLUDE 'SUPL' is executed, the information stored in 'SUPL' as shown in Section 8.12.2.1a will be input to this run (global problem). The following STRUDL commands will appear when INCLUDE 'SUPL' is executed.

```
INCLUDE 'SUPL'

FT08F001 DSNAME=TR.ROM.SUPER                          VOLSER=TR0070

 UNITS INCH LBF MUG RAD

  ELEMENT INCIDENCES

 'EL1      '          -
 '12       ' '1       ' '2       ' '3       ' '4       ' '5       '  -
 '6        ' '7       ' '8       ' '9       ' '10      ' '13      '  -
 '11       '
```

```
ELEMENT PROPERTIES

'EL1      ' -
TYPE 'SUPER' ST1 MAT GLO NOD   13 NDF 6 DISPL X Y Z ROTAT X Y Z
**** STRUDL MESSAGE - UNITS CONVERSION NOT PERFORMED ON MATRIX

SUBMATRIX   1   1
4.2415009628319E+07   1.9066124843603E+07  -6.9394762944201E+0
6.3180729272114E+01  -4.3267663611569E+01   1.5748090384058E+0
1.9066124843603E+07   4.4416110635303E+07  -1.5862114652807E+0

SUBMATRIX  13   13
1.1335090762970E+08   3.649451921139E+06   -1.3282892558559E+06 -
-2.0176316702426E+00  -2.740007455649E-01    9.9728522149893E-02
3.6494519211398E+06   6.614478443248E+07   -1.4264127396666E+07 -
-1.2717661301900E+07   4.929507378456E+07   -1.7941908834723E+07
-1.3282892558559E+06  -1.426412739666E+07    3.2146060876869E+07 -
-3.4941428759702E+07   1.354372931962E+08   -4.9295058933619E+07
-2.0176316702426E+00  -1.271766130190E+07   -3.4941428759702E+07 -
6.4870794654556E+08  -1.348650671040E+08    4.9086780973804E+07
-2.7400074556491E-01   4.929507378456E+07    1.3543729319624E+08 -
-1.3486506710403E+08   1.213631891056E+09   -4.4172500257267E+08
9.9728522149893E-02  -1.794190883472E+07   -4.9295058933619E+07 -
4.9086780973804E+07  -4.417250025726E+08    1.6077484366301E+08

CHANGES

LOAD  '1        '

  ADDITIONS & JOINT LOAD

'12      ' -
    FOR X  1.404231590E+02 Y  5.860265345E+02 Z  2.703640949E+02 -
    MOM X  1.720875519E+03 Y -4.482726696E+03 Z  1.631577160E+03

'1       ' -
    FOR X -1.291927974E+02 Y  2.928371325E+02 Z -1.486951470E+02 -
    MOM X -1.571301070E+02 Y -7.583625277E+01 Z  2.760211647E+01

'2       ' -
    FOR X -8.354504954E+01 Y  5.536851019E+02 Z -5.543073405E+01 -
    MOM X -1.650643913E+03 Y  4.060878826E+01 Z -1.478024973E+01

'11      ' -
    FOR X  1.329394832E+02 Y  3.266534392E+02 Z -1.590513240E+02 -
    MOM X -2.423447690E+02 Y  1.376006044E+02 Z -5.008237043E+01

$$$$

**** END OF DATA ON MEMBER SUPL
```

So, the element incidences, element properties of the stiffness matrix and load matrix are input to the run with a single command INCLUDE 'SUPL.' The same results occur when INCLUDE 'SUPR' is executed.

Now, almost all required information is already defined except the boundary conditions which define the folded plate structure. Hence, the following STRUDL commands are used.

```
$ DEFINE THE BOUNDARY CONDITIONS
SUPPORT JOINTS 12 13 14 15
JOINT 12 13 14 15 RELEASE MOMENT X
```

Once the joint locations, loading, boundary conditions and the super element properties are input, then the problem is ready to be solved. This is accomplished with the STIFFNESS ANALYSIS command

```
$ SOLVE THE PROBLEM
STIFFNESS ANALYSIS
```

The results of this stiffness analysis are the displacements at the super nodes

```
$ LIST THE RESULTS
UNIT FEET KIP DEGREE
LIST DISPLACEMENT
```

```
****************************
*RESULTS OF LATEST ANALYSES*
****************************

PROBLEM - GLOBAL    TITLE - SOLUTION OF THE TOTAL FOLDED PLATE

ACTIVE UNITS FEET KIPS DEG. FAHR SEC  MUG


LOADING - 1            WIND LOAD ON THE LEFT PLATE


RESULTANT JOINT DISPLACEMENTS - SUPPORTS       LOADING - 1
```

JOINT		/--------DISPLACEMENT------			//---------ROTATION------/		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
12	GLOBAL	0.0	0.0	0.0	0.0003182	0.0	0.0
13	GLOBAL	0.0	0.0	0.0	0.0003204	0.0	0.0
14	GLOBAL	0.0	0.0	0.0	0.0001713	0.0	0.0
15	GLOBAL	0.0	0.0	0.0	0.0001803	0.0	0.0

RESULTANT JOINT DISPLACEMENTS - FREE JOINTS LOADING - 1

JOINT		/----------DISPLACEMENT----------//		
		X DISP	Y DISP	Z DISP
1	GLOBAL	0.0000001	0.0000025	-0.0000017
2	GLOBAL	0.0000001	0.0000026	-0.0000015
3	GLOBAL	0.0000001	0.0000028	-0.0000014
4	GLOBAL	0.0000001	0.0000030	-0.0000014
5	GLOBAL	0.0000002	0.0000031	-0.0000014
6	GLOBAL	0.0000002	0.0000032	-0.0000014
7	GLOBAL	0.0000003	0.0000031	-0.0000014
8	GLOBAL	0.0000004	0.0000030	-0.0000014
9	GLOBAL	0.0000004	0.0000028	-0.0000014
10	GLOBAL	0.0000004	0.0000027	-0.0000015
11	GLOBAL	0.0000004	0.0000026	-0.0000018
JOINT		----------ROTATION----------/		
		X ROT	Y ROT	Z ROT
1	GLOBAL	-0.0001693	-0.0000195	-0.0000012
2	GLOBAL	-0.0002106	-0.0000069	0.0000098
3	GLOBAL	-0.0002560	-0.0000015	0.0000123
4	GLOBAL	-0.0002977	0.0000008	0.0000109
5	GLOBAL	-0.0003273	0.0000019	0.0000058
6	GLOBAL	-0.0003387	0.0000018	-0.0000007
7	GLOBAL	-0.0003296	0.0000009	-0.0000070
8	GLOBAL	-0.0003022	0.0000002	-0.0000117
9	GLOBAL	-0.0002626	0.0000020	-0.0000128
10	GLOBAL	-0.0002194	0.0000092	-0.0000087
11	GLOBAL	-0.0001815	0.0000245	0.0000088

Let's compare the results of displacement for this global problem (super element) with the results of Section 8.10.2 where 100 basic elements were used. The table below illustrates the corresponding nodal displacements for both runs.

	Joint	Displ. X	Displ. Y	Displ. Z
Super Element	1	$1x10^{-7}$	$2.5x10^{-6}$	$-1.7x10^{-6}$
Basic Element	6	$1x10^{-7}$	$2.5x10^{-6}$	$-1.7x10^{-6}$
Super Element	12	0	0	0
Basic Element	1	0	0	0
Super Element	6	$2x10^{-7}$	$3.2x10^{-6}$	$-1.4x10^{-6}$
Basic Element	61	$2x10^{-7}$	$3.2x10^{-6}$	$-1.4x10^{-6}$

	Joint	Rotation X	Rotation Y	Rotation Z
Super Element	1	$-1.7x10^{-4}$	$-1.9x10^{-5}$	$-1.2x10^{-6}$
Basic Element	6	$-1.7x10^{-4}$	$-1.9x10^{-5}$	$-1.2x10^{-6}$
Super Element	12	$3.2x10^{-4}$	0	0
Basic Element	1	$3.2x10^{-4}$	0	0
Super Element	6	$-3.4x10^{-4}$	$1.8x10^{-6}$	$-7x10^{-7}$
Basic Element	61	$-3.4x10^{-4}$	$1.8x10^{-6}$	$-7x10^{-7}$

As expected, both runs give the same answers. The results of using super elements will not change the answers of the total total problem. Since the result of condensation is just the redefinition of the model properties in terms of the degrees of freedom at the boundary nodes, the total behavior of the model will not be changed.

The internal stresses and displacements of each super element must be computed independently in another run (step 3). In that run, the local models presented in step 1 are reanalyzed using the super node displacements as their loading. To be able to use these super node displacements as input they must be stored. A special STRUDL command (see Section G.6.2.2 of STRUDL user Manual Appendix)

```
WRITE UNIT 8 SUPER DISP FILE 'NAME'

   i       (node list)
  'ai'
```

is available to store the super node displacements and the appropriate generated STRUDL commands into a user defined partitioned data set which can be recalled later in another run (step 3) with the INCLUDE command.

The node list for this WRITE unit: SUPER DISP ..... command corresponds to the nodes of the local problem, since they will be used in step 3.

Also, the order of occurrence of these nodes must be in the same order in which were created in the local problem.

The following STRUDL commands will store the super node displacements that correspond to the left hand plate component in the member 'LEFT' and to the right hand plate in the member 'RIGHT' of the partitioned data set.

```
$ WRITE THE SUPER NODES DISPLACEMENT INTO THE
$ PARTITIONED DATA SET
$ TO BE USED LATER WITH THE INCLUDE COMMAND FOR THE
$ SUPER ELEMENT
$ INTERNAL RESULTS RUN.
$ SEC G.6.2.2
WRITE UNIT 8 SUPER DISPLACEMENT FILE 'LEFT' PRINT
 'EL1' 1 6 12 18 24 30 36 42 48 54 60 61 66
WRITE UNIT 8 SUPER DISPLACEMENT FILE 'RIGHT' PRINT
 'EL2' 1 6 7 13 19 25 31 37 43 49 55 61 66
```

The following information is stored when the STRUDL command

```
WRITE UNIT 8 SUPER DISPLACEMENT FILE 'LEFT' PRINT
'EL1' 1 6 12 18 24 30 36 42 48 54 60 61 66
```

is executed.

```
$$
$$  DATE - 5/28/80  ELEMENT - EL1
$$
 UNITS INCH RAD
 SUPPORT JOINTS                    -
  '1        ' '6      ' '12       ' '18       ' '24        ' '30       '  -
  '36       ' '42     ' '48       ' '54       ' '60        ' '61       '  -
  '66       '
 CHANGES
 LOAD '1        '        -
     'WIND LOAD ON THE LEFT PLATE
 ADDITIONS  &  JOINT DISPLACEMENTS
 '1         '  -
            DISP X  0.00000E+05 Y  0.00000E+05 Z  0.00000E+05  -
            ROTA X  5.55406E-06 Y  0.00000E+05 Z  0.00000E+05
 '6         '  -
            DISP X  1.04858E-06 Y  3.02098E-05 Z -2.03271E-05  -
            ROTA X -2.95493E-06 Y -3.40297E-07 Z -2.08435E-08
 '12        '  -
            DISP X  1.05373E-06 Y  3.11069E-05 Z -1.79889E-05  -
            ROTA X -3.67647E-06 Y -1.20602E-07 Z  1.70622E-07
 '18        '  -
            DISP X  1.16810E-06 Y  3.32556E-05 Z -1.72079E-05  -
            ROTA X -4.46751E-06 Y -2.68238E-08 Z  2.13821E-07
 '24        '  -
            DISP X  1.52316E-06 Y  3.56150E-05 Z -1.70306E-05  -
            ROTA X -5.19558E-06 Y  1.44313E-08 Z  1.90690E-07
 '30        '  -
            DISP X  2.09980E-06 Y  3.73860E-05 Z -1.70631E-05  -
            ROTA X -5.71265E-06 Y  3.26966E-08 Z  1.01721E-07
 '36        '  -
            DISP X  2.80779E-06 Y  3.80986E-05 Z -1.70993E-05  -
            ROTA X -5.91061E-06 Y  3.08116E-08 Z -1.13624E-08
 '42        ' -
            DISP X  3.54822E-06 Y  3.75992E-05 Z -1.70147E-05   -
            ROTA X -5.75176E-06 Y  1.55179E-08 Z -1.22067E-07
 '48        '  -
            DISP X  4.23353E-06 Y  3.60308E-05 Z -1.68197E-05   -
            ROTA X -5.27430E-06 Y  4.15753E-09 Z -2.04663E-07
 '54        '  -
            DISP X  4.78086E-06 Y  3.38583E-05 Z -1.68218E-05   -
            ROTA X -4.58399E-06 Y  3.43508E-08 Z -2.24132E-07
 '60        '  -
            DISP X  5.11789E-06 Y  3.19289E-05 Z -1.78586E-05   -
            ROTA X -3.82875E-06 Y  1.61295E-07 Z -1.51494E-07
```

```
 '61        '  -
            DISP X  0.00000E+05 Y  0.00000E+05 Z  0.00000E+05  -
            ROTA X  5.59203E-06 Y  0.00000E+05 Z  0.00000E+05
 '66        '  -
            DISP X  5.22666E-06 Y  3.14724E-05 Z -2.13021E-05  -
            ROTA X -3.16836E-06 Y  4.27045E-07 Z  1.53771E-07

***STRUDL INFORMATION - FILE LEFT    SUPER ELEMENT EL1    IS STORED.
```

Similarly, when

```
            WRITE UNIT 8 SUPER DISPLACEMENT FILE 'RIGHT' PRINT
             'EL2' 1 6 7 13 19 25 31 37 43 49 55 61 66
```

is executed, the right hand plate information is stored as follows:

```
$$
$$  DATE -  5/28/80   ELEMENT - EL2
$$
 UNITS INCH RAD
 SUPPORT JOINTS                          -
 '1        ' '6       ' '7       ' '13      ' '19      ' '25      '  -
 '31       ' '37      ' '43      ' '49      ' '55      ' '61      '  -
 '66       '
 CHANGES
 LOAD '1        '          -
     'WIND LOAD ON THE LEFT PLATE                                      '
 ADDITIONS  &  JOINT DISPLACEMENTS
 '1        '  -
           DISP X  1.04858E-06 Y  3.02098E-05 Z -2.03271E-05  -
           ROTA X -2.95493E-06 Y -3.40297E-07 Z -2.08435E-08
 '6        '  -
           DISP X  0.00000E+05 Y  0.00000E+05 Z  0.00000E+05  -
           ROTA X  2.98902E-06 Y  0.00000E+05 Z  0.00000E+05
 '7        '  -
           DISP X  1.05373E-06 Y  3.11069E-05 Z -1.79889E-05  -
           ROTA X -3.67647E-06 Y -1.20602E-07 Z  1.70622E-07
 '13       '  -
           DISP X  1.16810E-06 Y  3.32556E-05 Z -1.72079E-05  -
           ROTA X -4.46751E-06 Y -2.68238E-08 Z  2.13821E-07
 '19       '  -
           DISP X  1.52316E-06 Y  3.56150E-05 Z -1.70306E-05  -
           ROTA X -5.19558E-06 Y  1.44313E-08 Z  1.90690E-07
 '25       '  -
           DISP X  2.09980E-06 Y  3.73860E-05 Z -1.70631E-05  -
           ROTA X -5.71265E-06 Y  3.26966E-08 Z  1.01721E-07
 '31       '  -
           DISP X  2.80779E-06 Y  3.80986E-05 Z -1.70993E-05  -
           ROTA X -5.91061E-06 Y  3.08116E-08 Z -1.13624E-08
 '37       '  -
           DISP X  3.54822E-06 Y  3.75992E-05 Z -1.70147E-05  -
           ROTA X -5.75176E-06 Y  1.55179E-08 Z -1.22067E-07
```

```
'43      '  -
         DISP X  4.23353E-06 Y  3.60308E-05 Z -1.68197E-05  -
         ROTA X -5.27430E-06 Y  4.15753E-09 Z -2.04663E-07
'49      '  -
         DISP X  4.78086E-06 Y  3.38583E-05 Z -1.68218E-05  -
         ROTA X -4.58399E-06 Y  3.43508E-08 Z -2.24132E-07
'55      '  -
         DISP X  5.11789E-06 Y  3.19289E-05 Z -1.78586E-05  -
         ROTA X -3.82875E-06 Y  1.61295E-07 Z -1.51494E-07
'61      '  -
         DISP X  5.22666E-06 Y  3.14724E-05 Z -2.13021E-05  -
         ROTA X -3.16836E-06 Y  4.27045E-07 Z  1.53771E-07
'66      '  -
         DISP X  0.00000E+05 Y  0.00000E+05 Z  0.00000E+05  -
         ROTA X  3.14721E-06 Y  0.00000E+05 Z  0.00000E+05
```

***STRUDL INFORMATION - FILE RIGHT SUPER ELEMENT EL2 IS STORED.

Again, the first information that the WRITE UNIT 8 SUP DISP ..... command generates is the UNIT command followed with the SUPPORT JOINTS command. The node list provided in the WRITE UNIT 8 SUP DISP.... command are defined as support joints. This is necessary since the nodal displacements at these joints will be used as displacement loading in the next step. Next, the super node displacements are converted into a joint displacement loading.

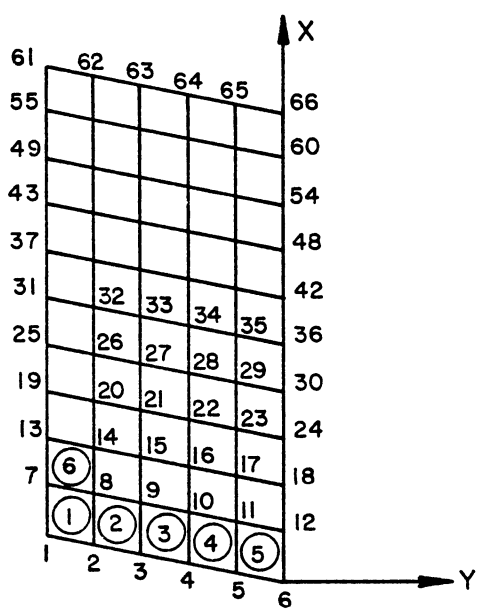
8.12.2.3 Calculation of the Internal Results for Each Super Element

In the last step, (global problem) only the super node displacements are obtained. In order to obtain the internal results of each super element (substructure), the local model (step 1) that has created the super element is reanalyzed using the super node displacements as the applied loading.

Hence, in this step a regular finite element procedure is used to analyze the substructure with the displacement results of step 2 (global problem) as input displacement loading and the super node as support joints.

8.12.2.3.a) For the Left Hand Side Plate:

The same mesh layout, type of element, element properties and wind load used in step 1, Section 8.12.2.1a are employed. The boundary conditions and the super nodes displacement loadings are already stored in the member 'LEFT' of the partitioned data set as illustrated in Section 8.12.2.2. With the use of INCLUDE 'LEFT' this information can be recalled.



The STRUDL commands used to describe the type of structural problem, the location of joints (mesh layout), the type of element, the element properties and the wind load are the following:

```
STRUDL 'LEFT' 'INTERNAL RESULTS OF THE LEFT PLATE'
$ DEFINE THE TYPE OF STRUCTURAL PROBLEM BEFORE THE
$ ELEMENT INCIDENCES
UNIT FEET KIP DEGREE
TYPE PLATE
$ INPUT THE SAME DATA AS USED TO CREATE THE SUPER
$ ELEMENT 'SUPL'
$ GENERATE THE JOINT AND INCIDENCES USING OPTION 2
USE STRUCTURE GENERATOR
SPACING 11 X 1.
SPACING 6 Y ANGLE 160. YZ 1.
SHAPE DIMENSION 2 NODES 4
GENERATE PRINT OFF
END STRUCTURE GENERATOR
$ DEFINE ELEMENT PROPERTIES
ELEMENT PROPERTIES
1 TO 50 TYPE 'PBSQ2' THICKNESS 0.5
CONSTANTS
E 4320000. ALL
POISSON 0.3 ALL
G 1660000. ALL
$ INPUT LOADING
LOADING 1 'SIDE WIND LOAD'
ELEMENT 1 TO 50 LOAD SURFACE FORCE GLOBAL PY .15
```

The boundary conditions and the super node displacements which will act as displacement loading are recalled from the member 'LEFT' of the partitioned data set, using the STRUDL command

```
$ READ IN THE BOUNDARY CONDITIONS WHICH CORRESPOND THE
$ SUPER NODES
$ DISPLACEMENTS WHICH ARE STORED IN THE FILE 'LEFT'
INCLUDE 'LEFT'
```

So, when INCLUDE 'LEFT' is executed, the information stored in the member 'LEFT' as presented in Section 8.12.2.2a will become now the input for this run.

In order to get the internal results of the substructure 'EL1' the STRUDL command

```
$ SOLVE FOR THE INTERNAL RESULTS
STIFFNESS ANALYSIS
```

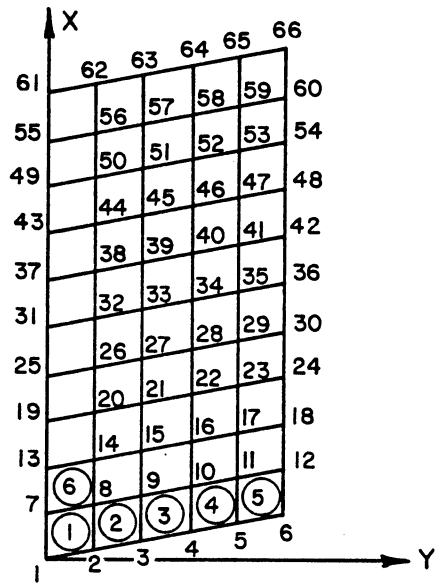
is used. And finally, the results can be listed in a way that is convenient to the user.

```
$ LIST THE OUTPUT
$ MAKE SURE TO CHECK THE UNITS
$ LIST THE STRESSES USING THE POST PROCESSOR PROGRAM
  'QQSTDPBS'
UNIT KIP FEET DEGREE
EXECUTE PROGRAM 'QQSTDPBS'
FINISH
```

Again, the results of this run should be the same as the one obtained in Section 8.10.2.

b) <u>For the Right Hand Side Plate:</u>

The mesh layout for this case is the same as the one used in Section 8.12.2.1.b.



The same procedure discussed for the left hand side plate applies here. The following STRUDL commands are used to solve this problem.

```
STRUDL 'RIGHT' 'INTERNAL RESULTS OF THE RIGHT PLATE'
$ DEFINE THE TYPE OF STRUCTURAL PROBLEM BEFORE THE
$ ELEMENT INCIDENCES
UNIT FEET KIP DEGREE
TYPE PLATE
$ INPUT THE SAME DATA AS USED TO CREATE THE SUPER
$ ELEMENT 'SUPR'
$ GENERATE THE JOINT AND INCIDENCES USING OPTION 2
USE STRUCTURE GENERATOR
SPACING 11 X 1.
SPACING 6 Y ANGLE 20. YZ 1.
SHAPE DIMENSION 2 NODES 4
GENERATE PRINT OFF
END STRUCTURE GENERATOR
$ DEFINE ELEMENT PROPERTIES
ELEMENT PROPERTIES
1 TO 50 TYPE 'PBSQ2' THICKNESS 0.5
CONSTANTS
E 4320000. ALL
POISSON 0.3 ALL
G 1660000. ALL
$ DEFINE THE LOADING BEFORE IT IS READ IN FROM THE
$ INCLUDE COMMAND
LOADING 1 'SIDE WIND LOAD'
$ READ IN THE BOUNDARY CONDITIONS WHICH CORRESPOND TO
$ THE SUPER NODES
$ DISPLACEMENTS WHICH ARE STORED IN THE FILE 'RIGHT'
INCLUDE 'RIGHT'
$ SOLVE FOR THE INTERNAL RESULTS
STIFFNESS ANALYSIS
$ LIST THE OUTPUT
$ MAKE SURE TO CHECK THE UNITS
$ LIST THE STRESSES USING THE POST PROCESSOR PROGRAM
$ 'QQSTDPBS'
UNIT KIP FEET DEGREE
EXECUTE PROGRAM 'QQSTDPBS'
FINISH
```

8.12.3 JCL Needed to Run 'Super' Element Problem.

In order to use the INCLUDE & WRITE SUPER ..... commands the user must have a partitioned data set to store all the properties of the 'super' element.

A partitioned data set is a data set composed of many independent member data sets, i.e., a change of a member in the partitioned data set will not affect other members in the set.

For the runs in Section 8.12.2.1, 8.12.2.2 and 8.12.2.3, the partitioned data set name used is TR.ROM.SUPER and the member names are:

for

Section 8.12.2.1.a	'SUPL'
Section 8.12.2.1.b	'SUPR'
Section 8.12.2.2.a & b	'LEFT' & 'RIGHT'

The following JCL is needed to execute a job with a 'super' element.

i) The first run, when a partitioned data set is to be created, for the WRITE SUPER ELEMENT FEATURE (see Appendix J, Section E.1).

Add the following JCL at the end of the BDSTRUDL file.
(Ø = zero)

input parameters

```
//GO.FT94FØØ1  DD  SPACE=(TRK,(a,a)),DCB=BLKSIZE=3120
//GO.FTØ8FØØ1  DD  DISP=(NEW,CATLG),UNIT=TRGEN,
//    DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120),
//    SPACE=(TRK,(a,a,5)),DSN=TR.ROM.SUPER.INCLUDE,
//    LABEL=RETPD=10
```

The DSN (data set name) = is defined by the user. LABEL = RETPD = 10. This means the data set will be kept for 10 days, the user can change this number to a longer or shorter period of days. The parameter a in the SPACE can be determined, see Section G.6.2.4.

In this case a = 6

For this particular example; (6.1)

NJ = number of super node is 13

NDF = number of degrees of freedom per joints is 6

BT_S : number of bytes for the stiffness matrix only

$BT\ 3d_S = \frac{NJ(NJ+1)}{2} * NDF * 80$; since NDF > 3 BT_S should be double.

or $BT_S = NJ(NJ+1) \times NDF \times 80$
$= 13(14)6(80)$
$= 87,360$ bytes

BT_L : number of bytes for the load matrix
$BT_L = 3*NL*NJ*80$ where NL = # of loads = 1

$BT_L = 3(1)(13)(80) = 3120$

<u>Total bytes needed:</u>

$BT_P = 1.1(BT_S + BT_M + BT_L)$

$BT_P = 1.1(87,360 + 3120) = 99,528$ bytes

$NTRACK_P = a = BTp/Tracksize$;

Tracksize = 19,000 bytes/track

$a = \frac{99,528}{19,000}$ 5.28 track; use <u>6 tracks</u>

a = 6

ii) After the partitioned data is already created and cataloged, and the WRITE SUPEREL... feature is needed, the following JCL should be added at the end of the 'BDSTRUDL' file.

```
//GO.FT94FØØ1  DD  SPACE=(TRK,(a,a)),DCB=BLKSIZE=3120

//GO.FTØ8FØØ1  DD  DSN=TR.ROM.SUPER,DISP=OLD
```