ANALYTICAL PARAMETRIC STUDY OF A TIED-BACK SYSTEM FOR REINFORCING DISTRESSED BRIDGE ABUTMENTS

FINAL REPORT

Volume II

USER'S MANUAL FOR PROGRAM BART

Submitted to
South Dakota Department of Transportation

by

Sangchul Bang, Ph.D., P.E.
and
Hyeong I. Yeon

Department of Civil Engineering
South Dakota School of Mines and Technology
Rapid City, SD 57701

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PROGRAM ABSTRACT

TITLE: Bridge Abutment Reinforcement with Tie-rods (BART)

AUTHOR: Sangchul Bang
Professor of Civil Engineering
South Dakota School of Mines and Technology
Rapid City, SD 57701
Tel) 605-394-2440

DESCRIPTION: This FORTRAN computer program performs the design and analysis of a tie-rod and drilled-in concrete anchor system that reinforces distressed sill-type concrete bridge abutments supported by piles. It calculates the minimum required dimensions of tie-rods and drilled-in concrete anchors, as well as the detailed response of the entire system including the displacements, strains, stresses, axial forces, shear forces, and bending moments of the continuum and the structural members.

FORMULATION: The design method is based on the limit equilibrium approach in which the detailed parameters are determined from the equilibrium condition for adequate safety. The analysis method is based on the generalized plane strain finite element approach. The finite element grid remains in two dimensions, even though the response of the system is in three dimensions. The soil continuum can be either linear elastic or nonlinear inelastic. The nonlinear inelastic soil characterization follows the hyperbolic soil model. The structural elements are however linear elastic.

PROGRAM STRUCTURE: The program is written in FORTRAN 5 for IBM compatible personal computers. It is compiled in such a way that the program can be run with or without a math coprocessor. The core storage

requirements are approximately 288 Kbytes for the executable program and 146 Kbytes for the output. Running time varies from 5 to 40 minutes, depending upon how the material characterization and the incremental analysis are specified. Input is from either the keyboard or a data file. Output is written to the file whose name is specified by the user in the input. The finite element grid used for the analysis can be plotted and copied using a separate plotting program (PLOT or PLOT2).

RESTRICTIONS: The program contains a subroutine which converts relatively simple input into the necessary parameters for the finite element analysis. It therefore includes certain geometric restrictions. If any of the restrictions are violated, the program terminates with a description of the reason displayed. If a FORTRAN 5 computer language rule is violated in input, it displays error message(s) that are provided by the compiler (Microsoft FORTRAN Compiler 5.0). Also note that all letters of the alphabet must be in upper case.

REMARK: This program and the user's manual have been revised from the previous ones. The user's manual is written for the program version of BART10.

Introduction

This manual is divided into five sections. The first section includes a brief description of the input parameters. The second section contains a detailed explanation of the input parameters. The third section describes the output of the program. The fourth section illustrates an example problem.

It is anticipated that, initially, the user will need to frequently consult the second, third, and fourth sections. As users become familiar with the program, they will probably need to use only the first section.

In order to facilitate the consultation of the explanatory information contained in the second section, subsections are numbered the same as in Section I.

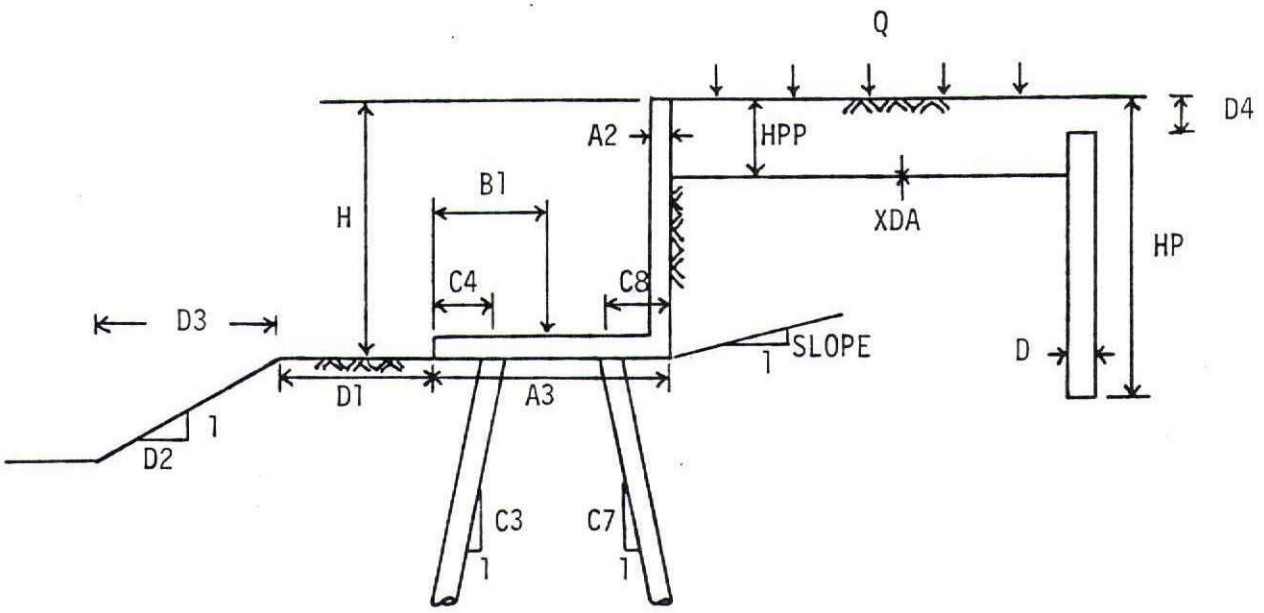
The program uses either four or six files, depending upon whether an input data file exists or not. In both cases, file 5 refers to keyboard input, file 6 to monitor output, and file 7 to the output file that will be generated. When a new set of input data is entered, i.e., when the designated input data file name does not exist, file 8 will be used to create a duplicate input data file. When the existing input data file (file 9) is recalled, the user can run the problem either with or without changes in data. In the former case, the program will create a new data file that is edited using file 10, while the original data file is retained. In addition, file 4 is generated to store necessary data for the finite element grid plot. It is important, therefore, to record all input and output file names for future use. The detailed instruction of how these files are used will be displayed at the beginning of execution of the program. The file names can be as long as 12 characters.

Section I - Input

The program itself is virtually self-explanatory. As the calculation proceeds, the program will continuously ask for input of information giving detailed instructions to the user. Please make sure that correct units for input parameters are used. Since a significant amount of output may be generated, the program will ask the user whether specific portions of the output are desired or not. They can be stored in a file or skipped by entering appropriate input according to the instruction.

Note that the program is written using mostly free format for data input, unless otherwise specified. When inputting parameters in free format, the data, if more than one, must be separated by blank spaces. The input parameters that have an asterisk (*) are integer variables, i.e., they should not have any decimal. Enter all data starting from column 1.

Following is a complete list, in order, of the input parameters. Refer to Figure 1 for a schematic sketch of geometric input parameters.



CROSS - SECTION

Figure 1. Geometric Input Parameters

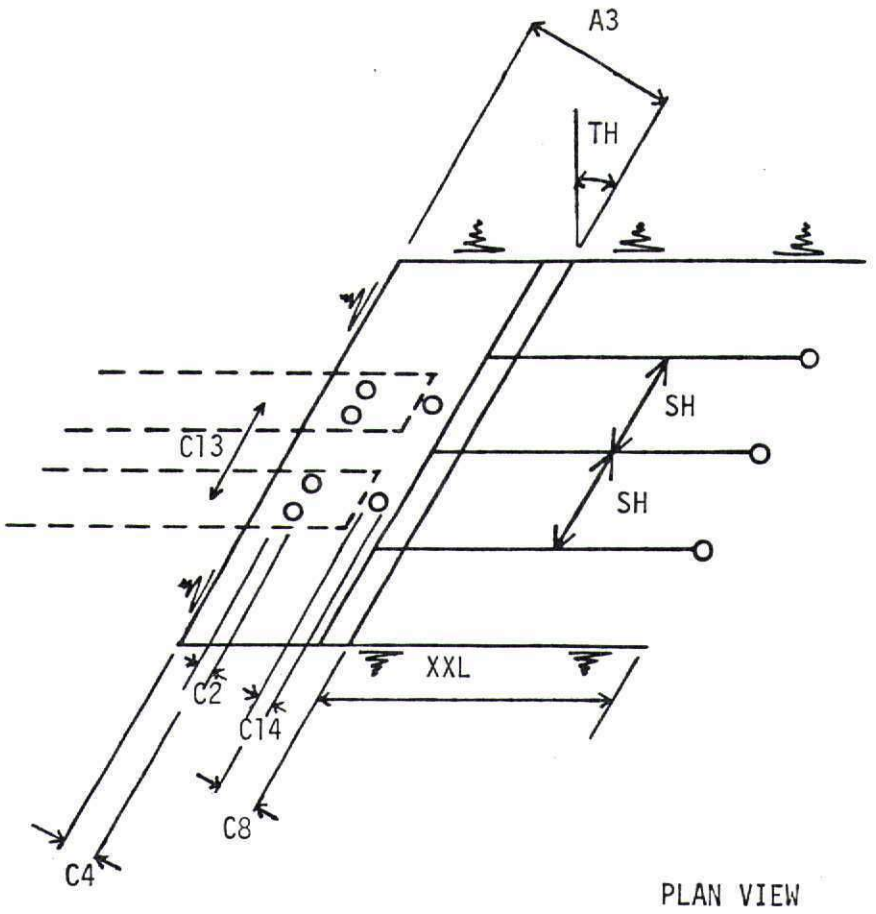


Figure 1 . Geometric Input Parameters (Continued)

1. FILEIN : Input data file name. If this name already exists, the program assumes that you are going to use the existing file. If not, a new file will be created.

   FILEOUT : Output file name. The majority of output results will not appear on the monitor. They will be written to this file.

2. TITLE : Heading information to be printed in the output as a title for the problem. It can be up to 72 characters.

3. FNEW : Edited input data file name. Only needed when changes in existing data file (FILEIN) are desired.

4. H : Height of abutment in feet.

   HPP : Depth from ground surface to tie-rod in ft.

   SLOPE : Backfill material slope in V/H

   Q : Amount of surcharge on the ground in psf.

5. DEL : Friction angle between the abutment and the backfill material in degrees.

   TH : Bridge skew angle in degrees.

   SH : Tie-rod spacing in ft.

   FA : Allowable strength of tie-rod material in psi.

   FS : Factor of safety to be considered for the selection of tie-rod diameter.

6. D : Diameter of drilled-in concrete anchor in ft. RETURN results in D = 2.5 ft.

7. Soil Properties: Enter either soil designation numbers or direct input as follows:

   To use the designation number, enter the appropriate number, KCODE*, from Tables - 2 and 3.

   GAM1 : Unit weight of backfill soil in pcf.

   PH1 : Internal friction angle of backfill soil in degrees.

8. GAM2 : Unit weight of soil below the abutment in pcf.

   C2 : Cohesion of soil below the abutment in psf.

   PH2 : Friction angle of soil below the abutment in degrees.

   SU : Undrained shear strength of soil below the abutment in psf.

   ZT : Depth in ft. from the ground surface at which SU is measured.

9. The program at this step will calculate and display the design selection of tie-rod and drilled-in concrete anchor. Note that for the finite element analysis, it is necessary to have the tip of a drilled-in concrete anchor located below the bottom elevation of the abutment. If the calculated depth of drilled-in concrete anchor does not satisfy this requirement, the program will ask the user to increase the depth of the drilled-in concrete anchor.

   HP : Desired new length of drilled-in concrete anchor in ft. Input HP to increase the length of drilled-in concrete anchor. New output will be generated.

   This step ends the design part of the program. Note that all the results are minimum required ones based on limiting equilibrium at failure.

10. The program will ask for new values of tie-rod diameter, length, and/or surcharge loading to be used in the analysis part of the program. Changes may be necessary, since the minimum required diameter of the tie-rod as calculated from limiting equilibrium usually does not match commercially available sizes. To predict the correct response of the system, the actual size of tie-rod to be used in the field must be inputted.

    XDA : New value of tie-rod diameter in inches.

    XXL : New value of tie-rod length in ft.

    XQ : New value of surcharge magnitude in psf.

11. ITMAX* : Maximum number of iterations between 1 and 9 allowed for nonlinear analysis.

    Default is ITMAX = 9. Use any number for linear analysis.

    RELAX : Relaxation factor to be used for nonlinear analysis. Default is RELAX = 0.8. Use any number for linear analysis.

    ERMAX : Maximum error permitted during iteration for nonlinear analysis.

    Defaults is ERMAX = 0.05. Use any number for linear analysis.

    INR* : 1 for two increment analysis.

    0 for one increment analysis.

12. A3 : Width of abutment base in ft.

    B1 : Distance from abutment toe to bridge girder support in ft.

    Note that the bridge girder support must be located between the supporting piles.

    D1 : Horizontal extension of berm in front of the abutment in ft.

    Must be greater than zero.

    D2 : Slope of soil embankment beyond the berm in front of the abutment in H/V. Must be greater than zero.

    D3 : Horizontal extension of the slope described by D2 in ft.

    Must be greater than zero.

    D4 : Depth to the top of the drilled-in concrete anchor from the ground surface in ft. Default is D4 = 0.

13. C3 : Front row pile batter toward the berm in V/H.

    C7 : Rear row pile batter toward the backfill in V/H.

    C9 : Length of front row piles in ft.

    C10 : Length of rear row piles in ft.

    IPILE* : 1 for friction piles.

    0 for point bearing piles.

14. C4 : Distance from toe of abutment base to front row piles in ft.

    C8 : Distance from heel of abutment base to rear row piles in ft.

15. PN2 : Bridge girder support reaction load per unit thickness in lbs/ft.

16. The following set of data is needed to define the backfill soil properties.

    KEL* : 1 for linear elastic properties.

    0 for nonlinear inelastic properties.

    If the backfill soil properties were specified by a designation number in step 7, go to step 17. Otherwise, enter the following:

    If KEL = 1,

    ESO : Young's modulus in psf

    POIS : Poisson's ratio

    GY : Unit weight in pcf. Must be negative

    If KEL = 0,

    K : Loading modulus

    KUR : Unloading - reloading modulus

    N : Modulus exponent

    RF : Failure ratio

    C : Cohesion in psf

    PHI : Internal friction angle in degrees

    DPHI : Change in PHI over 10-fold increase in confining pressure in degrees

    KB : Bulk modulus parameter

    M : Bulk modulus exponent

    POIS : Constant poisson's ratio, if desired.

    GX : Horizontal body force in pcf

    GY : Unit weight in pcf. Must be negative.

17. The following set of data is needed to define the foundation soil properties.

    KEL* : 1 for linear elastic properties.

    0 for nonlinear inelastic properties.

    If the foundation soil properties were specified by a designation number in step 8, go to step 18. Otherwise, follow step 16 for approrpirate input.

18. The following set of data is needed to define the front row piles.

    For circular piles,

    IC1* : Number of piles per group.

    C2 : Outside pile diameter in ft.

    C14 : Inside pile diameter in ft.

    C11 : Pile material modulus in psi.

    C13 : Pile group center-to-center spacing in ft.

    For noncircular piles,

    IC1* : Number of piles per group.

    XA : Cross-sectional area in in^2.

    YI : Moment of inertia about the z -axis in in^4.

    Typically this is the moment of inertia about the major axis.

    ZI : Moment of inertia about the 3-axis in in^4.

    Typically this is the moment of inertia about the minor axis.

    C11 : Pile material modulus in psi.

    C13 : Pile group center-to-center spacing in ft.

19. Set of data needed to define the rear row piles. Follow the same input as in step 18.

20. A2 : Thickness of abutment in ft.

21. C11 : Tie-rod material modulus in psi.

22. A2 : Thickness of abutment base in ft.

Section II - Explanatory Information

The program designs a tie-rod system utilizing a cylindrical drilled-in concrete anchor for reinforcing a distressed sill-type bridge abutment based on the limit equilibrium method. It also analyzes the system by a generalized plane strain finite element method of analysis.

The design section of the program calculates the minimum required dimensions of tie-rods and drilled-in concrete anchors for adequate safety. This information is then passed on to the analysis section of the program to calculate the two dimensional (three dimensional for a skew bridge) responses of the system. They include the displacements, strains, and stresses of the soil as well as the displacements, thrusts, shear forces, and bending moments of the structural elements (piles, abutment, tie-rods and drilled-in concrete anchors). The development of design and analysis method is included in volume one of this report and volume one of the previous report (1).

There are several noticeable features included in the program. It allows the user to perform either one increment or two increment analysis. If one increment analysis is used, all elements, including the continuum, the abutment, the piles, the tie-backs, and the drilled-in concrete anchors are considered simultaneously during analysis of the system. If two increment analysis is used, foundation soil below the abutment is first analyzed in increment one to calculate the in-situ stresses that develope without displacements. Remaining elements, i. e., the backfill and the structural elements, are then added in the second increment to calculate the incremental response of the system.

The choice of whether one or two increment analysis should be used depends primarily upon the age of foundation soil below the abutment. If the foundation

soil is a relatively recent fill, one increment analysis is appropriate, since additional settlement of foundation soil due to its own weight is expected. On the other hand, if the foundation soil has been in place for a relatively long period of time, two increment analysis is more appropriate because the expected settlement of the foundation soil induced by its own weight probably has already taken place.

The program also allows the user to select either linear elastic soil properties or nonlinear inelastic hyperbolic soil properties (2). The former can be expressed by a set of constant values of Young's modulus and Poisson's ratio, while the latter requires several parameters describing the nonlinear behavior of the soil. Please refer to step 16 for a list of these parameters. For the user's convenience, different ways of defining the nonlinear soil properties are also included.

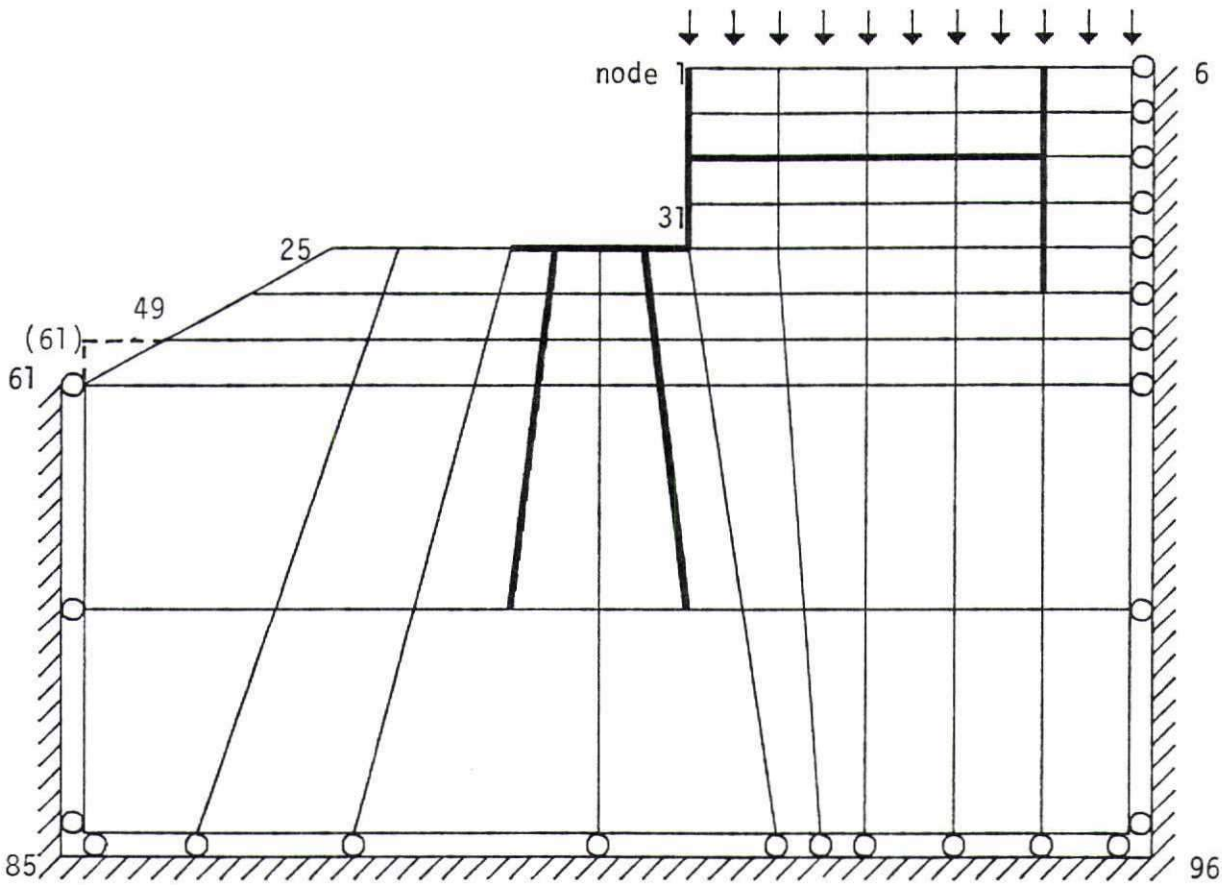
Unlike conventional finite element analysis that requires the input of nodal coordinates, boundary conditions, element information, material properties, etc., this program contains a subroutine which converts relatively simple input into the necessary parameters for the finite element analysis. In other words, the program asks the user to input a sequence of geometric, material and loading parameters to define the problem. A brief description of how the parameters are generated is explained below.

The necessary information regarding the nodes, elements, material properties, and boundary conditions are automatically generated based on input described in steps 4 through 22. Figure 2 shows a schematic of a generated finite element grid. The total horizontal extent of the solution domain is defined as the larger of

$$H = 4(L_1 + L_2) + 1.5\ L_3$$

or

$$H = 2\ L_4 + 1.5\ L_3$$



Element numbering for structural elements are

Tie-rod	:	80 - 83 from left to right
Concrete anchor	:	84 - 88 from top to bottom
Abutment stem	:	76 - 79 from top to bottom
Abutment base	:	89 - 92 from left to right
Front row pile	:	93, 95, 97, 99 from top to bottom
Rear row pile	:	94, 96, 98, 100 from top to bottom

Figure 2. Schematics of Generated Finite Element Grid

where L_1 = width of the abutment base

L_2 = width of the berm in front of the abutment base

L_3 = projected length of the tie-rod on the plane perpendicular to the abutment.

L4 = horizontal distance from the abutment heel to the tip of the front row piles.

The horizontal extent of the solution domain is then checked against the extent of the sloping soil berm in front of the abutment. If the extent of the sloping soil berm is within the left boundary specified by H, node 49 becomes the end of the sloping berm. If not, the extent of the sloping berm has no effect in defining the boundary.

The vertical dimension of the solution domain is

$$V = L_4 + 1.5\, L_5 \cos \theta$$

where L_4 = height of the abutment

L_5 = length of the piles

θ = pile batter angle from the vertical

The interior nodes are then generated by equally dividing the coordinates of the nodes that define the boundary or locations of significant structural elements.

The element numbering and material number designation are as following:

1. Elements 1 - 22 (material number 3):

   Soils below the middepth of the piles.

2. Elements 23 - 55 (material number 2):

   Soils between the abutment base and the middepth of the piles.

3. Elements 56 - 75 (material numbers 1 or 2):

   Backfill material. Elements located above the diagonal defined by connecting the lower left corner (node 31) and the upper right corner (node 6) have material number 1. Elements located below the diagonal have material number 2.

4. Elements 76 - 79 (material number 6):

   Concrete abutment stem.

5. Elements 80 - 83 (material number 7):

   Tie-rod.

6. Elements 84 - 88 (material number 8):

   Drilled-in concrete anchor.

   If the top of the drilled-in concrete anchor is not located at the ground surface, the top element (number 84) will have material properties with small magnitude so that the presence of the top element becomes negligible.

7. Elements 89 - 92 (material number 9):

   Abutment base.

8. Elements 93, 95, 97, 99 (material number 4):

   Front row piles.

9. Elements 94, 96, 98, 100 (material number 5):

   Rear row piles.

The specified boundary conditions in two imcrement analysis include three fixed sides of the solution domain, i.e., left, right and bottom in increment 2. In increment 1, they are however supported by rollers without allowing the out-of-plane directional (z) movements. The tips of the point bearing piles are restricted against any movement or rotation.

Described below is the explanatory information regarding the input contained in Section I. The capabilities of the program can be best realized by reading the following information and references cited therein. Please note that the numbering is the same as Section I to facilitate cross referencing.

2. Title:

The data set for each new problem must begin with a title. There are no restrictions or requirements regarding the contents of title except the 72 character limit.

4. H:

The height of abutment wall is measured from the top of the abutment to the bottom elevation of the abutment base.

HPP:

The tie-rods are assumed to be horizontal.

Q:

The amount of surcharge must include the contributions from the traffic load, the pavement, and the impact load. If a typical HS20 trailer truck (36 Tons) occupying an area of 10' x 30' is considered (5), then

(1) uniform load = 0.016 x 36 Tons/10 ft = 115 psf

(2) concentrated load = (0.45 + 0.65) x 36 Tons/300 ft^2 = 264 psf

(3) impact load = 0.3 x [(1) + (2)] = 114 psf

(4) pavement load = 150 pcf x 1 ft thickness = 150 psf

Therefore Q = (1) + (2) + (3) + (4) = 643 psf.

5. DEL:

The friction angle between the abutment and the backfill soil can be determined from direct shear tests in the laboratory. If test results are not available, values from Table-1 can be used for estimation (6).

TH:

The bridge skew angle is measured from the line perpendicular to the bridge girders to the alignment of the abutment. Therefore, when the abutment is placed perpendicular to the bridge girders, the skew angle is zero.

FA:

The allowable strength of tie-rod material can be found from the manufacturer's brochure.

FS:

In general, a factor of safety near 1.5 is recommended for most circum-

Table-1 Friction Factors for Dissimilar Materials

Interface Materials	Friction angle, δ degrees
Mass concrete on the following materials:	
Clean sound rock	35
Clean gravel, gravel-sand mixtures, coarse sand	29 to 31
Clean fine to medium sand, silty medium to coarse sand, silty or clayey gravel	24 to 29
Clean fine sand, silty or clayey fine to medium sand	19 to 24
Fine sandy silt, nonplastic silt	17 to 19
Very stiff and hard residual or preconsolidated clay	22 to 26
Medium stiff and stiff clay and silty clay	17 to 19
(Masonry on foundation materials has same friction factors)	
Steel sheet piles against the following soils:	
Clean gravel, gravel-sand mixtures, well-graded rock fill with spalls	22
Clean sand, silty sand-gravel mixture, single size hard rock fill	17
Silty sand, gravel or sand mixed with silt or clay	14
Fine sandy silt, nonplastic silt	11
Formed concrete or concrete sheet piling against the following soils:	
Clean gravel, gravel-sand mixture, well-graded rock fill with spalls	22 to 26
Clean sand, silty sand-gravel mixture, single size hard rock fill	17 to 22
Silty sand, gravel or sand mixed with silt or clay	17
Fine sandy silt, nonplastic silt	14
Various structural materials:	
Masonry on masonry, igneous and metamorphic rocks:	
Dressed soft rock on dressed soft rock	35
Dressed hard rock on dressed soft rock	33
Dressed hard rock on dressed hard rock	29
Masonry on wood (cross grain)	26
Steel on steel at sheet pile interlocks	17

stances. A higher factor of safety may be needed if a high probability of uncertainty exists. Note that FS is used only for the selection of tie-rod diameter.

6. D:

The necessary diameter of the drilled-in concrete anchor must follow the drilling standard (usually in even inches). Please refer to a drilled shaft manual or handbook for details.

7. GAM1, PH1:

Table-2 shows the measured properties of two backfill soils; crushed Minnekahta Limestone and Sioux Quartzite. The former is typically used in West Rever localities, whereas the latter is mostly used in East River localities.

8. GAM2, C2, PH2:

The foundation soil properties can be determined in the laboratory or from Tables-2 and 3.

SU, ZT:

The undrained shear strength of the foundation soil, SU, measured at a depth of ZT will be used to determine the length of drilled-in concrete anchors against short term stability. Therefore, SU needs to be measured at a depth between the ground surface and the bottom elevation of the abutment base. The soil friction angle, PH2, if unspecified, will be calculated by the program from the values of SU and ZT. If SU is left unspecified, the program will calculate SU from C2 and PH2.

11. ITMAX:

The analysis is carried out with incremental steps with iteration conducted in each increment (for linear analysis, the number of iterations is specified as 1). Iteration is necessary when nonlinear soil properties, which depend

Table-2 Nonlinear Material properties of Selected Soils

KCODE	Soil	Description	K	N	RF	C (psf)	PHI	γ (pcf)
1	Crushed Limestone		700	0.85	0.74	0	50	103.5
2	Crushed Quartzite		525	0.95	0.76	0	50	103.5
3	Reddish brown silty clay	Meade Co. 8 - 10 ft.	140	0.34	0.59	2,400	17	137.5
4	Reddish brown silty clay	Meade Co. 13 - 15 ft.	150	0.23	0.43	1,700	30	137.5
5	Reddish brown silty clay	Meade Co. 18 - 20 ft.	215	0.41	0.60	1,100	35	136.0
6	Gray silty clay w/pebbles	Pennington Co. 8.5 - 10.5 ft.	290	0.32	0.65	0	50	125.3
7	Gray shale	Pennington Co 14 - 16 ft.	70	1.57	0.73	1,550	15	124.8
8	Light brown silty clay	Pennington Co. 8 - 9 ft.	90	0.26	0.63	1,850	25	125.0
9	Light brown silty clay	Pennington Co. 13 - 15 ft.	235	0.10	0.79	1,650	30	126.6
10	Brown silty clay w/ pebbles	Pennington Co. 18 - 20 ft.	220	0.36	0.82	0	36	125.5
11	Brown silty clay w/pebbles	Minnehaha Co. 13 - 14 ft.	125	0.26	0.76	0	32	134.3
12	Brown silty clay w/pebbles	Minnehaha Co. 16 - 17 ft.	140	0.53	0.67	0	42	127.8
13	Gray brown shale	Jones Co. 32 - 56 ft.	470	0.21	0.37	0	40	121.5
14	Gray silty clay	Lawrence Co. 7.5 - 9 ft.	170	0.38	0.53	1,200	24	124.0
15	Gray silty clay	Lawrence Co. 14 - 15 ft.	245	0.25	0.65	1,500	35	125.6
16	Gray silty clay	Lawrence Co. 19 - 20 ft.	105	0.36	0.57	0	40	125.0
17	Brown silty clay	Brule Co. 3 - 16 ft.	195	0.20	0.80	1,300	40	128.7
18	Brown silty clay	Brule Co. 32 - 42 ft.	255	0.34	0.70	2,950	10	122.0
19	Brown silty clay	Brule Co. 51 - 55 ft.	305	0.42	0.65	2,100	32	122.0
20	Gray shale	Buffalo Co. 38 - 41.5 ft.	115	0.92	0.20	0	50	116.0

*Depth is measured from the ground surface.
K = Loading Modulus
N = Modulus Exponent
RF = Failure Ratio

Table- 3 Nonlinear Material properties of Compacted Soils

KCODE	Soil	Description	K	N	RF	C (psf)	ϕ PHI	$\Delta\phi$ DPHI	KB	M	γ (pcf)
21	GW, GP SW, SP	105% of STD. AASHTO	600	0.4	0.7	0	42	9	175	0.2	150
22	GW, GP SW, SP	100	450	0.4	0.7	0	39	7	125	0.2	145
23	GW, GP SW, SP	95	300	0.4	0.7	0	36	5	75	0.2	140
24	GW, GP SW, SP	90	200	0.4	0.7	0	33	3	50	0.2	135
25	SM	100	600	0.25	0.7	0	36	8	450	0.	135
26	SM	95	450	0.25	0.7	0	34	6	350	0.	130
27	SM	90	300	0.25	0.7	0	32	4	250	0.	125
28	SM	85	150	0.25	0.7	0	30	2	150	0.	120
29	SM, SC	100	400	0.6	0.7	500	33	0	200	0.5	135
30	SM, SC	95	200	0.6	0.7	400	33	0	100	0.5	130
31	SM, SC	90	150	0.6	0.7	300	33	0	75	0.5	125
32	SM, SC	85	100	0.6	0.7	200	33	0	50	0.5	120
33	CL	100	150	0.45	0.7	400	30	0	140	0.2	135
34	CL	95	120	0.45	0.7	300	30	0	110	0.2	130
35	CL	90	90	0.45	0.7	200	30	0	80	0.2	125
36	CL	85	60	0.45	0.7	100	30	0	50	0.2	120

*Soil designation is based on Unified Classification System.

upon the current stress state, are used. ITMAX specifies the maximum number of iterations allowed.

RELAX:

For many problems the rate of convergence of the iteration process can be improved by using a modified estimate of the soil modulus for the n^{th} iteration (E^*). This improved estimate is expressed in terms of the calculated modulus (E^n) and the value from the previous iteration (E^{n-1}), i.e., $E^* = E^{n-1} + RELAX(E^n - E^{n-1})$. When the convergence is oscillatory, a relaxation factor (RELAX) less than 1.0 should be used, while for asymptotic convergence, a value greater than 1.0 is necessary. Obviously, a value of RELAX close to zero will prevent convergence from occurring at all. If no evidence is available as to the nature of convergence, it is recommended to use 1.0, i.e., no relaxation. For typical problems, a RELAX value of 0.6 - 0.8 is used.

ERMAX:

During iteration, the resulting error is calculated based on the second vector norm of displacements between two consecutive iterations.

$$\text{error} = \left| \frac{U(n) - U(n^{-1})}{|U(n)|} \right|$$

$$U(n) = \sqrt{\Sigma\, u_i(n)^2}$$

where $u_i(n)$ = array of displacements and rotations of node i at n^{th} iteration.

At any stage during iteration, when the resulting error is less than or equal to ERMAX, convergence is assumed to be obtained. If the solution fails to converge, a message is printed indicating the magnitude of

the error, and the solution process continues as if convergence had been obtained.

INR:

Use 1 if two increment analysis is desired. Otherwise use zero for one increment analysis. If INR = 1, only foundation soil is considered in increment one and resulting stresses are calculated without any displacements being added in increment 2.

12. Please refer to Section IV, Example Problem, for the determination of geometric parameters.

A3:

Use the total extent of the abutment base from the toe to the backface of the abutment stem.

13. IPILE:

Use 0 if pile tips sit on top of rock or hardpan to describe point-bearing piles. Use 1 if piles are designed as friction piles.

16.

17. ESO:

Initial tangent modulus of the soil measured from stress-strain curve. If a soil designation number (KCODE) is used, ESO is estimated as K times the atmospheric pressure, where K is the loading modulus. Refer to Table-4 for typical values of the tangent modulus of various soils.

POIS:

Poisson's ratio describes the volume change behavior of the soil. POIS = 0.5 represents an incompressible material, e.g., saturated soil, and POIS = 0 is for fully compressible materials. Note that POIS of 0.0 or 0.5 may cause numerical instability during computation. Refer to Table-4 for several typical values of POIS.

Table-4 Recommended Values of Tangent Modulus (E) and Poisson's Ratio (υ)

Type of Soil	Properties of soil	Void ratio e		
		0.41 to 0.5	0.51 to 0.6	0.61 to 0.70
Sand (course)	(degrees)	43	40	38
υ = 0.15	E (lb/in^2)	6,550	5,700	4,700
	E (kN/m^2)	45,200	39,300	32,400
Sand (medium coarse)	(degrees)	40	38	35
υ = 0.2	E (lb/in^2)	6,550	5,700	4,700
	E (kN/m^2)	45,200	39,300	32,400
Sand (fine grained)	(degrees)	38	36	32
	E (lb/in^2)	5,300	4,000	3,400
υ = 0.25	E (kN/m^2)	36,600	27,600	23,500
Sandy silt	(degrees)	36	34	30
υ= 0.3 to 0.35	E (lb/in^2)	2,000	1,700	1,450
	E (kN/m^2)	13,800	11,700	10,000
Soft clay	E = (100 - 5000) Su			
Stiff clay	E = (500 - 1,500) Su			
Over Consolidated clay	$E = E_{NCC} \sqrt{OCR}$			

GY:

Gravity induced unit weight of soil. The value of GY must be negative, since the coordinate is defined as positive upward.

K, KUR, N, RF,
C, PHI, DPHI, KB, M:

These are the parameters that define hyperbolic nonlinear inelastic material behavior during loading. The instantaneous tangent modulus is calculated from

$$E_t = K\,Pa\,\left(\frac{\sigma_3}{Pa}\right)^n \left[\frac{1 - R_f(1-\sin\phi)(\sigma_1 - \sigma_3)}{2C\cos\phi + 2\sigma_3\sin\phi}\right]^2$$

where σ_1 = major principal stress at mid-increment

σ_3 = minor principal stress at mid-increment

K = loading modulus (K)

Pa = atmospheric pressure

n = modulus exponent (N)

R_f = failure ratio (RF)

C = Cohesion (C)

ϕ = friction angle

The derivation of these parameters from laboratory soil testing is explained in Volume I of the previous report (1).

The friction angle is defined as $\phi = \phi_o - \Delta\phi \log_{10}\left(\frac{\sigma_3}{Pa}\right)$

where ϕ_o = friction angle at zero confining pressure (PHI)

$\Delta\phi$ = change in friction angle over 10 fold increase in confining pressure (DPHI)

The instantaneous Piosson's ratio is calculated from

$$\nu_t = 1/2 - \frac{E_t}{6B}$$

$$B = K_b Pa \left(\frac{\sigma_3}{Pa}\right)^m$$

where B = bulk modulus

K_b = bulk modulus parameter (KB)

m = modulus exponent (M)

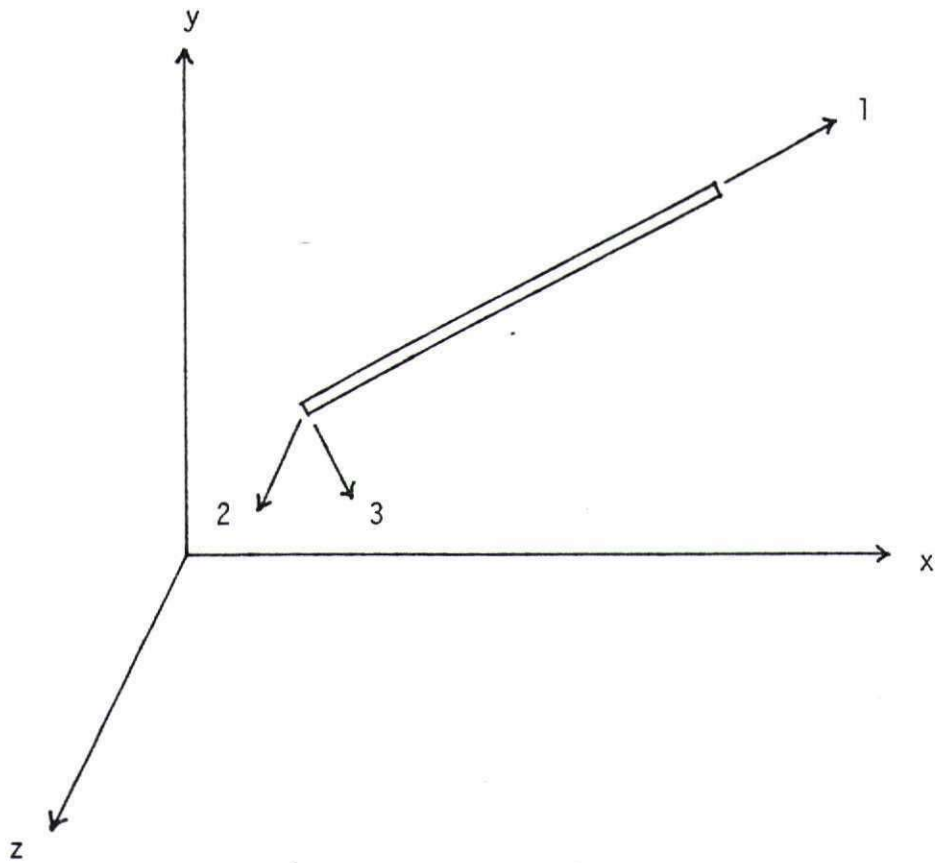
This soil model assumes that the soil does not experience any stress or strain induced anisotropy. In order to avoid numerical problems, the program limits values of Poisson's ratio to between 0.001 and 0.495. Also, when a tensile value of σ_3 develops, a relatively small value of tangent modulus, instead of zero, is used to avoid any numerical problems. This idealized soil characterization, though widely used, has some limitations which should be understood by the user. These limitations are described in reference (4). The values of the principal stresses, σ_1 and σ_3 are established by the iteration process. For the first iteration of the first increment, an estimate of the stress state is found as follows: σ_1 is taken to be γh, where γ is the unit weight of the soil and h is the depth of the center of the element below the ground surface, and σ_3 is taken to be $\frac{\upsilon_t}{1 - \upsilon_t}$. As iteration proceeds, this estimate is updated.

KCODE:

The nonlinear hyperbolic parameters of several representative soils, as described previously, have been obtained from laboratory triaxial testing (1). Table-2 describes the parameters for two backfill materials and 18 soils

from various locations (and depths) in South Dakota. Also shown in Table-3 are typical nonlinear hyperbolic parameters of several compacted soils available from the literature (2).

18. If there exists only one row of piles, one can analyze the problem by specifying the material and geometric properties of either the front row piles (if the piles are installed between the toe of the abutment base and the girder support) or the rear row piles (if the piles are installed between the heel of the abutment base and the girder support), while using very small values for the other row piles. For instance, a pile diameter of 0.01 ft., pile material modulus of 0.01 psi, etc., can be used. Assuming that the piles lie on the xy plane, the coordinates 2 and z are identical (Figure 3). YI is the moment of inertia about the z or 2 axis, whereas ZI is that about the 3 axis. Typically YI is the moment of inertia about the major axis, and ZI is that about the minor axis.



1, 2, 3 = local

x, y, z = global coordinates

coordinate 1 is along the axis.

Figure 3. Local and Global Coordinates

Section III - Output

The first part of the output describes the results of the limit equilibrium design of the system. It includes the calculated minimum requirements for the diameter of the tie-rod, the depth of the drilled-in concrete anchor considering both long term and short term stability, and the length of tie-rods. Following the design output, results from the generalized plane strain finite element analysis are printed. In most cases, the program asks the user whether the detailed output is desired or not. Described below is the complete output.

1. Nodal Point Data

This contains nodal coordinates, boundary conditions, and equation numbers. The nodal coordinate origin is located at the bottom of abutment (Figure 2), with x being measured positive toward the backfill and y being measured positive upward. Boundary conditions are specified as being either 0 or 1 for each of the 6 degrees of freedom, i.e., x-translation (D-X), y-translation (D-Y), z-translation (D-Z), x-rotation (TH-X), y-rotation (TH-Y), and z-rotation (TH-Z). 0 specifies free and 1 specifies fixed condition. Note that nodes associated with the continuum only must have TH-X, TH-Y and TH-Z of 1. Global equation numbers indicate the position of non-trivial displacements and rotations.

2. Nodal Point Load

This contains concentrated loads and moments acting on the nodes. The sign convention follows the x, y and z coordinates of the global system. Therefore, a nodal load acting as a vertical girder support loading usually has a negative sign.

3. Material Properties

The first three materials (numbers 1 - 3) represent soils. The first is for the backfill soil properties behind the abutment, the second for soil between the abutment and mid-depth of the piles, and the third for soil below the mid-depth of the piles. They will have either linear elastic or nonlinear inelastic soil characterization parameters. These parameters are described in Section II.

The next 6 materials (numbers 4 - 9) are the structural elements. In the output,

AE indicates the product of cross-sectional area and Young's modulus.

GJ1 indicates the product of the polar moment of inertia along the 1-axis and the shear modulus.

EI2 indicates the product of the moment of inertia along the 2-axis and Young's modulus.

EI3 indicates the product of the moment of inertia along the 3-axis and Young's modulus.

E indicates the Young's modulus.

POIS indicates the Poisson's ratio.

FX indicates the horizontal body force.

FY indicates the vertical body force.

4. Element data

This section gives the element information, including the element number, the nodes defining the element, the nature of soil reinforcement, the material number, the skew angle, and the tractions. The nodes associated with a given element are numbered counterclockwise. Note that all soil elements have 4 nodes, while structural elements have only 2 nodes. REINF of 1 indicates that the element is a reinforced soil element. The bridge skew angle is shown,

if any, in elements 80 - 83 which define the tie-rods. If ground surcharge loading is considered, it will be shown as the y directional traction, TY, of elements 71 - 75.

5. Convergency

The calculation terminates when either the maximum number of iterations specified, ITMAX, is reached or the resulting error is less than or equal to the specified value, ERMAX. The resulting number of iterations and the error are printed. Note that if all materials are linear elastic, no iteration is performed.

6. Nodal Displacements

This section gives the node numbers, and the associated 6 global coordinate displacements and rotations. It is important to note that if two increment analysis is used, the displacements and rotations in increment 1 are only for the user's reference; they will not be added in increment 2. Also printed at the final increment are the horizontal movements of the abutment at the top, at the tie-rod level, and at the base.

7. Element Output

First, the element number, location, strains, and stresses are printed. Depending upon the user's request, results are printed at the center and/or along the sides of the elements. CEN indicates that the strains and stresses are those at the center of the element. I-J indicates that the strains and stresses are along the side defined by the first two nodes associated with the element as shown in the element data output. Similarly, J-K indicates those between second and third nodes.

After the location, 5 strain values are printed; DEXX is the normal strain along the x coordinate, DEYY is the normal strain along the y coordinate, DGXY is the shear strain on the yz plane along the y coordinate, DGXZ is the shear

strain on yz plane along the z coordinate, and DGYZ is the shear strain on the xz plane along the z coordinate. Normal strains along the z coordinate are not printed due to the nature of plane strain. All strain designations have letter D in front, indicating that all the strain values are incremental - not cumulative.

Next, 6 components of the three dimensional stresses are printed. They are cumulative - not incremental - values, i.e., previous increment stresses are added. S indicates normal stress and T indicates shear stress. A mechanical sign convention and subscript designation are used, i.e., stresses and strains are positive in tension. For example, SXX indicates the normal stress along the x-coordinate and TXY indicates the shear stress on the yz plane along the y direction.

The second part of the element output contains the response of structural elements. Therefore, this part of the output is not provided for the first increment of two increment analysis. All the forces and moments are printed. The first designation (number 1 or 2) indicates the position of the node defining the element. The second designation (letter P or M) indicates whether the result is a force (P) or a moment (M). The third designation (number 1, 2, or 3) indicates the direction of the force or moment along the local coordinate as shown in Figure 4.

Therefore, 1-P1 indicates an axial thrust, 1-P2 and 1-P3 indicate shear forces along the 2 and 3 directions, 1-M1 represents torsion about the 1 axis, and 1-M2 and 1-M3 are the bending moments about the 2 and 3 axes at the first node defining the element. Finally, axial thrusts, shear forces and bending moments at the tie-rod level and base of the abutment are calculated and printed. The maximum shear force and bending moment at a given node, if desired, can be calculated from

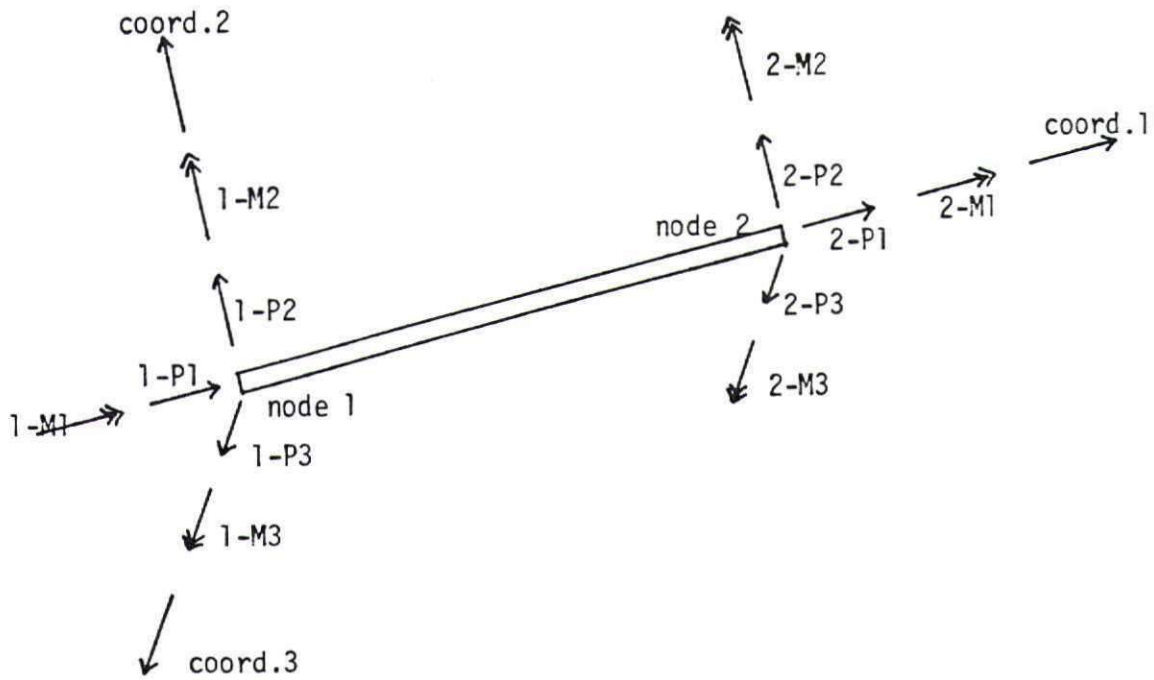


Figure 4. Element End Forces

$$V_{max} = \sqrt{(1\text{-}P2)^2 + (1\text{-}P3)^2}$$

$$M_{max} = \sqrt{(1\text{-}M2)^2 + (1\text{-}M3)^2}$$

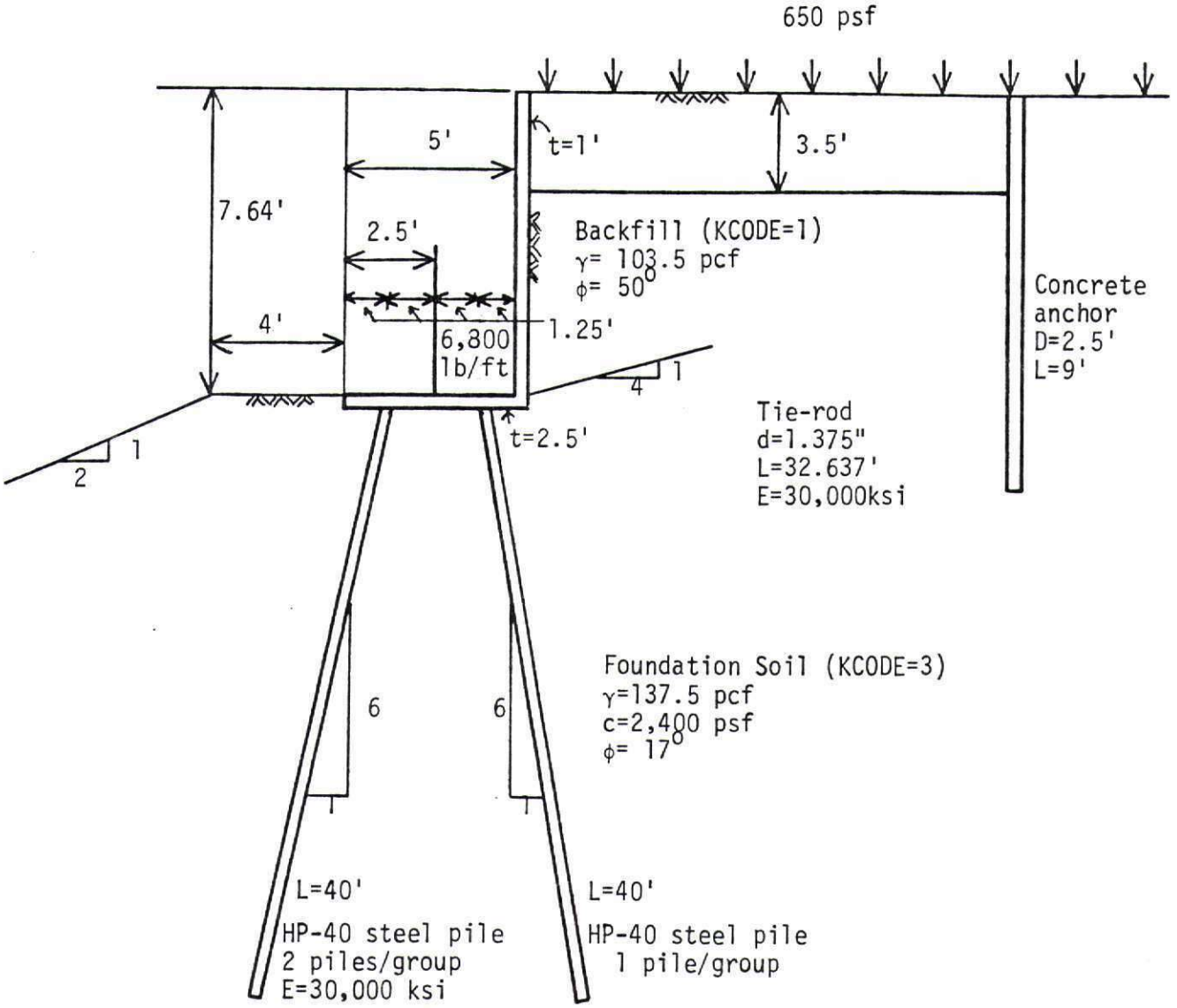
Note that the forces and moments are per linear foot along the direction of plane strain. To calculate the total forces and moments which develop within discrete structural elements, one needs to convert the values as shown below.

1. Tie rod:	Multiply by the tie-rod spacing to obtain the result per tie.
2. Drilled-in concrete anchor:	Multiply by the drilled-in concrete anchor spacing (same as tie-rod spacing) to obtain the result per anchor.
3. Abutment stem:	Answers are directly per linear foot.
4. Abutment base:	Answers are directly per linear foot.
5. Piles:	Multiply by the pile group spacing and then divided by the number of piles in the group to obtain forces and moments within each pile.

Section IV - Example

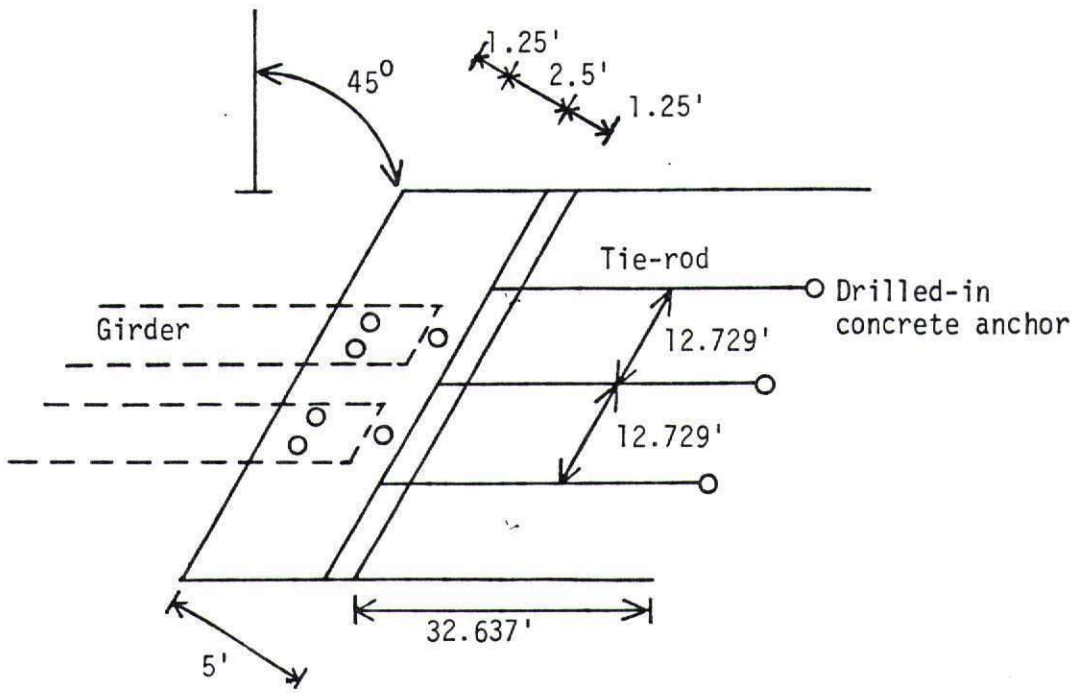
An example problem shown in Figure 5 has been selected for detailed analysis. Included in the figure are the material, geometric and loading properties that define the problem. Referring to Sections I, II and III, Table-5 for input data and Table-6 of output are provided.

The backfill consists of crushed Minnekahta Limestone (KCODE = 1) with a slope of 1:4 from the abutment base. The foundation soil is reddish brown silty clay (KCODE = 3). The abutment stem is 7.64 ft. in height with tie-rods located at a depth of 3.5 ft. from the ground surface. It is supported by two rows of HP-20 steel piles with a batter of 1:6. A surcharge of 650 lb/ft^2 is applied on the ground surface. The bridge girder reaction is assumed to be 6,800 lbs/ft. The response of the system has been obtained based on two increment analysis.



Wall friction angle = 30°
Bridge skew angle = 45°
Tie-rod spacing = 12.729'
Tie-rod strength = 90 ksi
Factor of safety = 1.5

Figure 5. Example Problem



PLAN VIEW

Figure 5. Example Problem (Continued)

```
        7.640000
        3.500000
    2.500000E-01
      650.000000
       30.000000
       45.000000
       12.729000
    90000.000000
        1.500000
         2.500000000
 1
 3
          9.000000000
          1.375000000
         32.637000000
        650.000000000
9
            .800000000
            .050000000
1
         5.000000
         2.500000
         4.000000
         2.000000
       100.000000
            .000000000
          6.000000000
          6.000000000
         40.000000000
         40.000000000
1
         1.250000
         1.250000
Y
     6800.000000
Y
Y
 0
 0
0
2
        12.400000
       210.000000
        71.700000
    3.000000E+07
        12.729000
Y
    5.000000E-01
        1.000000
    3.000000E+07
        2.500000
Y
Y
Y
Y
```

Table-5 Input Data

```
EXAMPLE


INPUT DATA FILE NAME  =BARTIN1
OUTPUT DATA FILE NAME =BARTOUT1


**INPUT DATA AS FOLLOWS**

  HEIGHT OF ABUTMENT WALL          =     7.640 FT
  DEPTH TO TIE ROD                 =     3.500 FT
  BACKFILL SLOPE (V/H)             =      .250
  SURCHARGE LOADING                =   650.000 PSF
  WALL FRICTION ANGLE              =    30.000 DEG
  BRIDGE SKEW ANGLE                =    45.000 DEG
  TIE ROD SPACING                  =    12.729 FT
  ALLOWABLE STRESS OF TIE ROD      =  .900E+05 PSI

BACKFILL SOIL PROPERTIES

  UNIT WEIGHT                      =   103.500 PCF
  FRICTION ANGLE                   =    47.000 DEG

FOUNDATION SOIL PROPERTIES
  UNIT WEIGHT                      =   137.500 PCF
  COHESION                         =  2400.000 PSF
  FRICTION ANGLE                   =    17.000 DEG
  UNDRAINED SHEAR STRENGTH         =  2013.560 PSF AT    .0 FT

CONCRETE ANCHOR DIAMETER           =     2.500 FT
FACTOR OF SAFETY                   =     1.500


**OUTPUT DATA AS FOLLOWS**

  MINIMUM DIAMETER OF TIE ROD    =      .843 IN


MINIMUM REQUIRED DIMENSIONS ARE

  LENGTH OF TIE ROD         =    28.531 FT
  LENGTH OF CONCRETE ANCHOR =     9.000 FT


******* FINAL DESIGN SELECTION *******
TIE ROD TENSION             = 50173.590 LBS PER TIE
TIE ROD DIAMETER            =     1.375 IN
TIE ROD LENGTH              =    32.637 FT
CONCRETE ANCHOR LENGTH      =     9.000 FT
CONCRETE ANCHOR DIAMETER    =     2.500 FT
```

Table-6 Output

GENERALIZED PLANE STRAIN FINITE ELEMENT ANALYSIS

RELAXATION = .80
MAXIMUM ERROR FOR ITERATION = .05
MAXIMUM NO. OF ITERATION = 9

**SOLUTION HAS TWO INCREMENTS
IN INCR 1 ONLY FOUNDATION SOIL STRESSES ARE CALCULATED

GEOMETRIC PARAMETERS

WIDTH OF ABUTMENT BASE	=	5.000 FT
DISTANCE FROM ABUTMENT TO GIRDER SUPPORT	=	2.500 FT
HORIZ EXTENSION OF BERM IN FRONT OF ABUT	=	4.000 FT
SLOPE OF SOIL BEYOND BERM (H/V)	=	2.000
HORIZ EXTENSION OF SLOPE BEYOND BERM	=	100.000 FT
DEPTH TO TOP OF DRILLED-IN ANCHOR	=	.000 FT
FRONT ROW PILE BATTER (V/H)	=	6.000
REAR ROW PILE BATTER (V/H)	=	6.000
LENGTH OF FRONT ROW PILES	=	40.000 FT
LENGTH OF REAR ROW PILES	=	40.000 FT

FRICTION PILES

DIST FROM FRONT OF BASE TO FRONT PILES	=	1.250 FT
DIST FROM REAR OF BASE TO REAR PILES	=	1.250 FT

NODAL POINT DATA

NODAL POINT COORDINATES			BOUNDARY CONDITION CODES **IN INCREMENT 2**						GLOBAL EQUATION NUMBER					
NODE	X(N)	Y(N)	D-X	D-Y	D-Z	TH-X	TH-Y	TH-Z	D-X	D-Y	D-Z	TH-X	TH-Y	TH-Z
1	.000	7.640	0	0	0	0	0	0	1	2	3	4	5	6
2	1.154	7.640	0	0	0	1	1	1	7	8	9	0	0	0
3	7.693	7.640	0	0	0	1	1	1	10	11	12	0	0	0
4	15.385	7.640	0	0	0	1	1	1	13	14	15	0	0	0
5	23.078	7.640	0	0	0	0	0	0	16	17	18	19	20	21
6	34.617	7.640	1	1	1	1	1	1	0	0	0	0	0	0
7	.000	5.890	0	0	0	0	0	0	22	23	24	25	26	27
8	1.154	5.890	0	0	0	1	1	1	28	29	30	0	0	0
9	7.693	5.890	0	0	0	1	1	1	31	32	33	0	0	0
10	15.385	5.890	0	0	0	1	1	1	34	35	36	0	0	0
11	23.078	5.890	0	0	0	0	0	0	37	38	39	40	41	42
12	34.617	5.890	1	1	1	1	1	1	0	0	0	0	0	0
13	.000	4.140	0	0	0	0	0	0	43	44	45	46	47	48
14	1.154	4.140	0	0	0	0	0	0	49	50	51	52	53	54
15	7.693	4.140	0	0	0	0	0	0	55	56	57	58	59	60
16	15.385	4.140	0	0	0	0	0	0	61	62	63	64	65	66
17	23.078	4.140	0	0	0	0	0	0	67	68	69	70	71	72
18	34.617	4.140	1	1	1	1	1	1	0	0	0	0	0	0
19	.000	2.070	0	0	0	0	0	0	73	74	75	76	77	78
20	1.154	2.070	0	0	0	1	1	1	79	80	81	0	0	0
21	7.693	2.070	0	0	0	1	1	1	82	83	84	0	0	0
22	15.385	2.070	0	0	0	1	1	1	85	86	87	0	0	0
23	23.078	2.070	0	0	0	0	0	0	88	89	90	91	92	93
24	34.617	2.070	1	1	1	1	1	1	0	0	0	0	0	0
25	-9.000	.000	0	0	0	1	1	1	94	95	96	0	0	0
26	-7.000	.000	0	0	0	1	1	1	97	98	99	0	0	0
27	-5.000	.000	0	0	0	0	0	0	100	101	102	103	104	105
28	-3.750	.000	0	0	0	0	0	0	106	107	108	109	110	111
29	-2.500	.000	0	0	0	0	0	0	112	113	114	115	116	117
30	-1.250	.000	0	0	0	0	0	0	118	119	120	121	122	123
31	.000	.000	0	0	0	0	0	0	124	125	126	127	128	129
32	1.154	.000	0	0	0	1	1	1	130	131	132	0	0	0
33	7.693	.000	0	0	0	1	1	1	133	134	135	0	0	0
34	15.385	.000	0	0	0	1	1	1	136	137	138	0	0	0
35	23.078	.000	0	0	0	0	0	0	139	140	141	142	143	144
36	34.617	.000	1	1	1	1	1	1	0	0	0	0	0	0
37	-18.000	-4.500	0	0	0	1	1	1	145	146	147	0	0	0

38	-13.798	-6.288	0	0	0	1	1	1	148	149	150	0	0	0
39	-9.596	-8.076	0	0	0	1	1	1	151	152	153	0	0	0
40	-5.394	-9.864	0	0	0	0	0	0	154	155	156	157	158	159
41	-2.500	-9.864	0	0	0	1	1	1	160	161	162	0	0	0
42	.394	-9.864	0	0	0	0	0	0	163	164	165	166	167	168
43	2.158	-9.864	0	0	0	1	1	1	169	170	171	0	0	0
44	3.842	-9.864	0	0	0	1	1	1	172	173	174	0	0	0
45	10.013	-9.864	0	0	0	1	1	1	175	176	177	0	0	0
46	17.146	-9.864	0	0	0	1	1	1	178	179	180	0	0	0
47	23.078	-1.360	0	0	0	0	0	0	181	182	183	184	185	186
48	34.617	-9.864	1	1	1	1	1	1	0	0	0	0	0	0
49	-27.000	-9.000	0	0	0	1	1	1	187	188	189	0	0	0
50	-20.346	-12.576	0	0	0	1	1	1	190	191	192	0	0	0
51	-13.692	-16.152	0	0	0	1	1	1	193	194	195	0	0	0
52	-7.038	-19.728	0	0	0	0	0	0	196	197	198	199	200	201
53	-2.500	-19.728	0	0	0	1	1	1	202	203	204	0	0	0
54	2.038	-19.728	0	0	0	0	0	0	205	206	207	208	209	210
55	4.316	-19.728	0	0	0	1	1	1	211	212	213	0	0	0
56	6.530	-19.728	0	0	0	1	1	1	214	215	216	0	0	0
57	12.334	-19.728	0	0	0	1	1	1	217	218	219	0	0	0
58	18.907	-19.728	0	0	0	1	1	1	220	221	222	0	0	0
59	25.480	-15.476	0	0	0	1	1	1	223	224	225	0	0	0
60	34.617	-19.728	1	1	1	1	1	1	0	0	0	0	0	0
61	-36.000	-13.500	1	1	1	1	1	1	0	0	0	0	0	0
62	-26.894	-18.864	0	0	0	1	1	1	226	227	228	0	0	0
63	-17.788	-24.228	0	0	0	1	1	1	229	230	231	0	0	0
64	-8.682	-29.592	0	0	0	0	0	0	232	233	234	235	236	237
65	-2.500	-29.592	0	0	0	1	1	1	238	239	240	0	0	0
66	3.682	-29.592	0	0	0	0	0	0	241	242	243	244	245	246
67	6.474	-29.592	0	0	0	1	1	1	247	248	249	0	0	0
68	9.218	-29.592	0	0	0	1	1	1	250	251	252	0	0	0
69	14.654	-29.592	0	0	0	1	1	1	253	254	255	0	0	0
70	20.667	-29.592	0	0	0	1	1	1	256	257	258	0	0	0
71	26.680	-29.592	0	0	0	1	1	1	259	260	261	0	0	0
72	34.617	-29.592	1	1	1	1	1	1	0	0	0	0	0	0
73	-36.000	-36.342	1	1	1	1	1	1	0	0	0	0	0	0
74	-27.442	-37.380	0	0	0	1	1	1	262	263	264	0	0	0
75	-18.884	-38.418	0	0	0	1	1	1	265	266	267	0	0	0
76	-10.326	-39.456	0	0	0	0	0	0	268	269	270	271	272	273
77	-2.500	-39.456	0	0	0	1	1	1	274	275	276	0	0	0
78	5.326	-39.456	0	0	0	0	0	0	277	278	279	280	281	282
79	9.711	-39.456	0	0	0	1	1	1	283	284	285	0	0	0
80	13.250	-39.456	0	0	0	1	1	1	286	287	288	0	0	0
81	18.135	-39.456	0	0	0	1	1	1	289	290	291	0	0	0
82	23.308	-39.456	0	0	0	1	1	1	292	293	294	0	0	0
83	28.482	-39.456	0	0	0	1	1	1	295	296	297	0	0	0
84	34.617	-39.456	1	1	1	1	1	1	0	0	0	0	0	0
85	-36.000	-59.184	1	1	1	1	1	1	0	0	0	0	0	0
86	-28.538	-59.184	1	1	1	1	1	1	0	0	0	0	0	0
87	-21.076	-59.184	1	1	1	1	1	1	0	0	0	0	0	0
88	-13.614	-59.184	1	1	1	1	1	1	0	0	0	0	0	0
89	-2.500	-59.184	1	1	1	1	1	1	0	0	0	0	0	0
90	8.614	-59.184	1	1	1	1	1	1	0	0	0	0	0	0
91	12.948	-59.184	1	1	1	1	1	1	0	0	0	0	0	0
92	17.282	-59.184	1	1	1	1	1	1	0	0	0	0	0	0
93	21.615	-59.184	1	1	1	1	1	1	0	0	0	0	0	0
94	25.949	-59.184	1	1	1	1	1	1	0	0	0	0	0	0
95	30.283	-59.184	1	1	1	1	1	1	0	0	0	0	0	0
96	34.617	-59.184	1	1	1	1	1	1	0	0	0	0	0	0

**TOTAL NUMBER OF EQUATIONS = 297 IN INCR= 2

NODAL POINT LOAD TO BE INCLUDED IN INCREMENT 2

NODE	PN(X)	PN(Y)	PN(Z)	M(X)	M(Y)	M(Z)
29	.00000E+00	-.68000E+04	.00000E+00	.00000E+00	.00000E+00	.00000E+00

MATERIAL NUMBERS AS FOLLOWS
1 = BACKFILL SOIL
2,3= FOUNDATION SOIL
4 = FRONT ROW PILES
5 = REAR ROW PILES
6 = ABUTMENT STEM
7 = TIE ROD
8 = DRILLED IN CONCRETE ANCHOR
9 = ABUTMENT BASE

MATERIAL PROPERTIES

MAT.	K	KUR	N	RF	C	PHI	DPHI	KB	M	PA	FX	FY
1	700.00	1400.00	.85	.74	.00	47.00	12.00	208.00	.20	2116.80	.0000	-103.5000
2	140.00	280.00	.34	.59	2400.00	17.00	.00	130.00	.20	2116.80	.0000	-137.5000
3	140.00	280.00	.34	.59	2400.00	17.00	.00	130.00	.20	2116.80	.0000	-137.5000

FRONT ROW PILE PROPERTIES

GENERAL SHAPE PILE
NO OF PILES PER GROUP = 2
CROSS SECTIONAL AREA = 12.400 IN**2
MAJOR AXIS MOMENT OF INERTIA= 210.000 IN**4
MINOR AXIS MOMENT OF INERTIA= 71.700 IN**4
PILE MATERIAL MODULUS = .300E+08 PSI
PILE GROUP SPACING = 12.729 FT

MAT.	AE	GJ1	EI2	EI3	E	POIS	FX	FY
4	.58E+08	.37E+07	.69E+07	.23E+07	.43E+10	.25	.0000	.0000
5	.29E+08	.18E+07	.34E+07	.12E+07	.43E+10	.25	.0000	.0000

ABUTMENT STEM THICKNESS = 1.000 FT

6	.58E+09	.38E+08	.48E+08	.48E+08	.58E+09	.25	.0000	.0000

TIE-ROD MATERIAL MODULUS = .300E+08 PSI

7	.35E+07	.23E-04	.29E-04	.29E-04	.43E+10	.25	.0000	.0000
8	.22E+09	.69E+08	.87E+08	.87E+08	.58E+09	.25	.0000	.0000

ABUTMENT BASE THICKNESS = 2.500 FT

9	.14E+10	.35E+09	.75E+09	.12E+09	.58E+09	.25	.0000	.0000

ELEMENT DATA

IN INCR=1 ONLY ELEMENT 1 THRU 55 ARE CONSIDERED

ELEM	NODE1	NODE2	NODE3	NODE4	REINF	MAT	ANGLE	TX	TY
1	85	86	74	73	0	3	.00	.00	.00
2	86	87	75	74	0	3	.00	.00	.00
3	87	88	76	75	0	3	.00	.00	.00
4	88	89	77	76	0	3	.00	.00	.00
5	89	90	78	77	0	3	.00	.00	.00
6	90	91	79	78	0	3	.00	.00	.00
7	91	92	80	79	0	3	.00	.00	.00
8	92	93	81	80	0	3	.00	.00	.00
9	93	94	82	81	0	3	.00	.00	.00
10	94	95	83	82	0	3	.00	.00	.00
11	95	96	84	83	0	3	.00	.00	.00
12	73	74	62	61	0	3	.00	.00	.00
13	74	75	63	62	0	3	.00	.00	.00
14	75	76	64	63	0	3	.00	.00	.00
15	76	77	65	64	0	3	.00	.00	.00
16	77	78	66	65	0	3	.00	.00	.00
17	78	79	67	66	0	3	.00	.00	.00
18	79	80	68	67	0	3	.00	.00	.00
19	80	81	69	68	0	3	.00	.00	.00
20	81	82	70	69	0	3	.00	.00	.00
21	82	83	71	70	0	3	.00	.00	.00
22	83	84	72	71	0	3	.00	.00	.00
23	61	62	50	49	0	2	.00	.00	.00
24	62	63	51	50	0	2	.00	.00	.00
25	63	64	52	51	0	2	.00	.00	.00
26	64	65	53	52	0	2	.00	.00	.00
27	65	66	54	53	0	2	.00	.00	.00
28	66	67	55	54	0	2	.00	.00	.00
29	67	68	56	55	0	2	.00	.00	.00
30	68	69	57	56	0	2	.00	.00	.00
31	69	70	58	57	0	2	.00	.00	.00
32	70	71	59	58	0	2	.00	.00	.00
33	71	72	60	59	0	2	.00	.00	.00
34	49	50	38	37	0	2	.00	.00	.00
35	50	51	39	38	0	2	.00	.00	.00
36	51	52	40	39	0	2	.00	.00	.00
37	52	53	41	40	0	2	.00	.00	.00
38	53	54	42	41	0	2	.00	.00	.00
39	54	55	43	42	0	2	.00	.00	.00
40	55	56	44	43	0	2	.00	.00	.00
41	56	57	45	44	0	2	.00	.00	.00
42	57	58	46	45	0	2	.00	.00	.00
43	58	59	47	46	0	2	.00	.00	.00
44	59	60	48	47	0	2	.00	.00	.00
45	37	38	26	25	0	2	.00	.00	.00
46	38	39	27	26	0	2	.00	.00	.00
47	39	40	28	27	0	2	.00	.00	.00
48	40	41	29	28	0	2	.00	.00	.00
49	41	42	30	29	0	2	.00	.00	.00
50	42	43	31	30	0	2	.00	.00	.00
51	43	44	32	31	0	2	.00	.00	.00
52	44	45	33	32	0	2	.00	.00	.00
53	45	46	34	33	0	2	.00	.00	.00
54	46	47	35	34	0	2	.00	.00	.00
55	47	48	36	35	0	2	.00	.00	.00
56	31	32	20	19	0	1	.00	.00	.00
57	32	33	21	20	0	2	.00	.00	.00
58	33	34	22	21	0	2	.00	.00	.00
59	34	35	23	22	0	2	.00	.00	.00
60	35	36	24	23	0	2	.00	.00	.00
61	19	20	14	13	0	1	.00	.00	.00
62	20	21	15	14	0	1	.00	.00	.00
63	21	22	16	15	0	2	.00	.00	.00
64	22	23	17	16	0	2	.00	.00	.00
65	23	24	18	17	0	2	.00	.00	.00
66	13	14	8	7	0	1	.00	.00	.00
67	14	15	9	8	0	1	.00	.00	.00
68	15	16	10	9	0	1	.00	.00	.00
69	16	17	11	10	0	2	.00	.00	.00
70	17	18	12	11	0	2	.00	.00	.00
71	7	8	2	1	0	1	.00	.00	-650.00
72	8	9	3	2	0	1	.00	.00	-650.00
73	9	10	4	3	0	1	.00	.00	-650.00
74	10	11	5	4	0	1	.00	.00	-650.00
75	11	12	6	5	0	2	.00	.00	-650.00
76	1	7	0	0	0	6	.00	.00	.00
77	7	13	0	0	0	6	.00	.00	.00
78	13	19	0	0	0	6	.00	.00	.00
79	19	31	0	0	0	6	.00	.00	.00
80	13	14	0	0	0	7	45.00	.00	.00
81	14	15	0	0	0	7	45.00	.00	.00
82	15	16	0	0	0	7	45.00	.00	.00
83	16	17	0	0	0	7	45.00	.00	.00
84	5	11	0	0	0	8	.00	.00	.00
85	11	17	0	0	0	8	.00	.00	.00
86	17	23	0	0	0	8	.00	.00	.00
87	23	35	0	0	0	8	.00	.00	.00
88	35	47	0	0	0	8	.00	.00	.00
89	27	28	0	0	0	9	.00	.00	.00
90	28	29	0	0	0	9	.00	.00	.00

91	29	30	0	0	0	9	.00	.00	.00
92	30	31	0	0	0	9	.00	.00	.00
93	28	40	0	0	0	4	.00	.00	.00
94	30	42	0	0	0	5	.00	.00	.00
95	40	52	0	0	0	4	.00	.00	.00
96	42	54	0	0	0	5	.00	.00	.00
97	52	64	0	0	0	4	.00	.00	.00
98	54	66	0	0	0	5	.00	.00	.00
99	64	76	0	0	0	4	.00	.00	.00
100	66	78	0	0	0	5	.00	.00	.00

NODAL POINT DATA

NODAL POINT COORDINATES			BOUNDARY CONDITION CODES						GLOBAL EQUATION NUMBER					
			IN INCREMENT 1											
NODE	X(N)	Y(N)	D-X	D-Y	D-Z	TH-X	TH-Y	TH-Z	D-X	D-Y	D-Z	TH-X	TH-Y	TH-Z
1	.000	7.640	1	1	1	1	1	1	0	0	0	0	0	0
2	1.154	7.640	1	1	1	1	1	1	0	0	0	0	0	0
3	7.693	7.640	1	1	1	1	1	1	0	0	0	0	0	0
4	15.385	7.640	1	1	1	1	1	1	0	0	0	0	0	0
5	23.078	7.640	1	1	1	1	1	1	0	0	0	0	0	0
6	34.617	7.640	1	1	1	1	1	1	0	0	0	0	0	0
7	.000	5.890	1	1	1	1	1	1	0	0	0	0	0	0
8	1.154	5.890	1	1	1	1	1	1	0	0	0	0	0	0
9	7.693	5.890	1	1	1	1	1	1	0	0	0	0	0	0
10	15.385	5.890	1	1	1	1	1	1	0	0	0	0	0	0
11	23.078	5.890	1	1	1	1	1	1	0	0	0	0	0	0
12	34.617	5.890	1	1	1	1	1	1	0	0	0	0	0	0
13	.000	4.140	1	1	1	1	1	1	0	0	0	0	0	0
14	1.154	4.140	1	1	1	1	1	1	0	0	0	0	0	0
15	7.693	4.140	1	1	1	1	1	1	0	0	0	0	0	0
16	15.385	4.140	1	1	1	1	1	1	0	0	0	0	0	0
17	23.078	4.140	1	1	1	1	1	1	0	0	0	0	0	0
18	34.617	4.140	1	1	1	1	1	1	0	0	0	0	0	0
19	.000	2.070	1	1	1	1	1	1	0	0	0	0	0	0
20	1.154	2.070	1	1	1	1	1	1	0	0	0	0	0	0
21	7.693	2.070	1	1	1	1	1	1	0	0	0	0	0	0
22	15.385	2.070	1	1	1	1	1	1	0	0	0	0	0	0
23	23.078	2.070	1	1	1	1	1	1	0	0	0	0	0	0
24	34.617	2.070	1	1	1	1	1	1	0	0	0	0	0	0
25	-9.000	.000	0	0	0	1	1	1	1	2	3	0	0	0
26	-7.000	.000	0	0	0	1	1	1	4	5	6	0	0	0
27	-5.000	.000	0	0	0	1	1	1	7	8	9	0	0	0
28	-3.750	.000	0	0	0	1	1	1	10	11	12	0	0	0
29	-2.500	.000	0	0	0	1	1	1	13	14	15	0	0	0
30	-1.250	.000	0	0	0	1	1	1	16	17	18	0	0	0
31	.000	.000	0	0	0	1	1	1	19	20	21	0	0	0
32	1.154	.000	0	0	0	1	1	1	22	23	24	0	0	0
33	7.693	.000	0	0	0	1	1	1	25	26	27	0	0	0
34	15.385	.000	0	0	0	1	1	1	28	29	30	0	0	0
35	23.078	.000	0	0	0	1	1	1	31	32	33	0	0	0
36	34.617	.000	1	0	1	1	1	1	0	34	0	0	0	0
37	-18.000	-4.500	0	0	0	1	1	1	35	36	37	0	0	0
38	-13.798	-6.288	0	0	0	1	1	1	38	39	40	0	0	0
39	-9.596	-8.076	0	0	0	1	1	1	41	42	43	0	0	0
40	-5.394	-9.864	0	0	0	1	1	1	44	45	46	0	0	0
41	-2.500	-9.864	0	0	0	1	1	1	47	48	49	0	0	0
42	.394	-9.864	0	0	0	1	1	1	50	51	52	0	0	0
43	2.158	-9.864	0	0	0	1	1	1	53	54	55	0	0	0
44	3.842	-9.864	0	0	0	1	1	1	56	57	58	0	0	0
45	10.013	-9.864	0	0	0	1	1	1	59	60	61	0	0	0
46	17.146	-9.864	0	0	0	1	1	1	62	63	64	0	0	0
47	23.078	-1.360	0	0	0	1	1	1	65	66	67	0	0	0
48	34.617	-9.864	1	0	1	1	1	1	0	68	0	0	0	0
49	-27.000	-9.000	0	0	0	1	1	1	69	70	71	0	0	0
50	-20.346	-12.576	0	0	0	1	1	1	72	73	74	0	0	0
51	-13.692	-16.152	0	0	0	1	1	1	75	76	77	0	0	0
52	-7.038	-19.728	0	0	0	1	1	1	78	79	80	0	0	0
53	-2.500	-19.728	0	0	0	1	1	1	81	82	83	0	0	0
54	2.038	-19.728	0	0	0	1	1	1	84	85	86	0	0	0
55	4.316	-19.728	0	0	0	1	1	1	87	88	89	0	0	0
56	6.530	-19.728	0	0	0	1	1	1	90	91	92	0	0	0
57	12.334	-19.728	0	0	0	1	1	1	93	94	95	0	0	0
58	18.907	-19.728	0	0	0	1	1	1	96	97	98	0	0	0
59	25.480	-15.476	0	0	0	1	1	1	99	100	101	0	0	0
60	34.617	-19.728	1	0	1	1	1	1	0	102	0	0	0	0
61	-36.000	-13.500	1	0	1	1	1	1	0	103	0	0	0	0
62	-26.894	-18.864	0	0	0	1	1	1	104	105	106	0	0	0
63	-17.788	-24.228	0	0	0	1	1	1	107	108	109	0	0	0
64	-8.682	-29.592	0	0	0	1	1	1	110	111	112	0	0	0
65	-2.500	-29.592	0	0	0	1	1	1	113	114	115	0	0	0
66	3.682	-29.592	0	0	0	1	1	1	116	117	118	0	0	0
67	6.474	-29.592	0	0	0	1	1	1	119	120	121	0	0	0
68	9.218	-29.592	0	0	0	1	1	1	122	123	124	0	0	0
69	14.654	-29.592	0	0	0	1	1	1	125	126	127	0	0	0
70	20.667	-29.592	0	0	0	1	1	1	128	129	130	0	0	0
71	26.680	-29.592	0	0	0	1	1	1	131	132	133	0	0	0
72	34.617	-29.592	1	0	1	1	1	1	0	134	0	0	0	0
73	-36.000	-36.342	1	0	1	1	1	1	0	135	0	0	0	0
74	-27.442	-37.380	0	0	0	1	1	1	136	137	138	0	0	0
75	-18.884	-38.418	0	0	0	1	1	1	139	140	141	0	0	0
76	-10.326	-39.456	0	0	0	1	1	1	142	143	144	0	0	0
77	-2.500	-39.456	0	0	0	1	1	1	145	146	147	0	0	0
78	5.326	-39.456	0	0	0	1	1	1	148	149	150	0	0	0
79	9.711	-39.456	0	0	0	1	1	1	151	152	153	0	0	0
80	13.250	-39.456	0	0	0	1	1	1	154	155	156	0	0	0
81	18.135	-39.456	0	0	0	1	1	1	157	158	159	0	0	0
82	23.308	-39.456	0	0	0	1	1	1	160	161	162	0	0	0
83	28.482	-39.456	0	0	0	1	1	1	163	164	165	0	0	0
84	34.617	-39.456	1	0	1	1	1	1	0	166	0	0	0	0
85	-36.000	-59.184	1	1	1	1	1	1	0	0	0	0	0	0
86	-28.538	-59.184	0	1	1	1	1	1	167	0	0	0	0	0
87	-21.076	-59.184	0	1	1	1	1	1	168	0	0	0	0	0
88	-13.614	-59.184	0	1	1	1	1	1	169	0	0	0	0	0

89	-2.500	-59.184	0	1	1	1	1	1	170	0	0	0	0	0
90	8.614	-59.184	0	1	1	1	1	1	171	0	0	0	0	0
91	12.948	-59.184	0	1	1	1	1	1	172	0	0	0	0	0
92	17.282	-59.184	0	1	1	1	1	1	173	0	0	0	0	0
93	21.615	-59.184	0	1	1	1	1	1	174	0	0	0	0	0
94	25.949	-59.184	0	1	1	1	1	1	175	0	0	0	0	0
95	30.283	-59.184	0	1	1	1	1	1	176	0	0	0	0	0
96	34.617	-59.184	1	1	1	1	1	1	0	0	0	0	0	0

**TOTAL NUMBER OF EQUATIONS = 176 IN INCR= 1

**BANDWIDTH OF MATRIX = 40 IN INCR= 1

SOLUTION CONVERGED AFTER 3 ITERATIONS
RESULTING ERROR IS .11474E-01

DISPLACEMENTS AT NODES

NODE	X-TRAN	Y-TRAN	Z-TRAN	X-ROT	Y-ROT	Z-ROT
**NOTE THAT THE CALCULATED DISPLACEMENTS WILL NOT BE SUMMED IN INCR=2						
1	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
2	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
4	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
5	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
6	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
7	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
8	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
9	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
10	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
11	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
12	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
13	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
14	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
15	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
16	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
17	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
18	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
19	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
20	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
21	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
22	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
23	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
24	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
25	.25465E-01	-.55759E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
26	.22102E-01	-.57321E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
27	.18689E-01	-.58803E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
28	.17755E-01	-.59536E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
29	.17820E-01	-.59902E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
30	.17612E-01	-.60107E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
31	.17226E-01	-.60266E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
32	.16723E-01	-.60397E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
33	.14442E-01	-.61388E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
34	.11100E-01	-.62327E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
35	.47067E-02	-.63281E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
36	.00000E+00	-.63247E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
37	.11965E-01	-.48977E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
38	.18355E-03	-.52082E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
39	-.42890E-02	-.54286E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
40	-.54958E-02	-.55669E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
41	-.36123E-02	-.56776E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
42	-.21870E-02	-.57658E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
43	-.16299E-02	-.58102E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
44	-.13568E-02	-.58479E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
45	-.17259E-02	-.59508E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
46	-.27946E-02	-.60524E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
47	.38195E-02	-.63666E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
48	.00000E+00	-.60995E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
49	-.47653E-02	-.42661E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
50	-.15456E-01	-.45933E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
51	-.19311E-01	-.48079E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
52	-.20626E-01	-.48927E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
53	-.18801E-01	-.50623E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
54	-.16678E-01	-.51980E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
55	-.15678E-01	-.52552E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
56	-.14709E-01	-.53027E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
57	-.11944E-01	-.53952E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
58	-.83693E-02	-.54437E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
59	-.33847E-02	-.58024E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
60	.00000E+00	-.54976E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
61	.00000E+00	-.40056E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
62	-.97943E-02	-.40736E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
63	-.20692E-01	-.41305E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
64	-.28902E-01	-.40093E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
65	-.28923E-01	-.41947E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
66	-.26571E-01	-.43404E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
67	-.24733E-01	-.43903E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
68	-.22588E-01	-.44265E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
69	-.17539E-01	-.44811E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
70	-.11674E-01	-.45193E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
71	-.69128E-02	-.45563E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
72	.00000E+00	-.45576E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
73	.00000E+00	-.28079E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
74	-.19489E-01	-.27392E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
75	-.32719E-01	-.27942E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
76	-.39560E-01	-.28859E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
77	-.38697E-01	-.30730E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
78	-.33482E-01	-.31766E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
79	-.29361E-01	-.32142E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
80	-.25616E-01	-.32430E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
81	-.20203E-01	-.32702E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
82	-.14159E-01	-.32971E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00

83	-.76570E-02	-.33117E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
84	.00000E+00	-.33148E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
85	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
86	-.16890E-01	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
87	-.31756E-01	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
88	-.40335E-01	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
89	-.41208E-01	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
90	-.33827E-01	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
91	-.29511E-01	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
92	-.24605E-01	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
93	-.19068E-01	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
94	-.12958E-01	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
95	-.66116E-02	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
96	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00

ELEMENT STRAINS AND STRESSES

EL.NO.	LOC	DEXX	DEYY	DGXY	DGXZ	DGYZ	SXX	SYY	SZZ	TXY	TXZ	TYZ
1	CEN	-.227E-02	-.124E-01	-.378E-03	.000E+00	.000E+00	-.404E+04	-.588E+04	-.363E+04	-.342E+02	.000E+00	.000E+00
	I-J	-.226E-02	-.124E-01	-.265E-05	.000E+00	.000E+00	-.404E+04	-.588E+04	-.363E+04	-.240E+00	.000E+00	.000E+00
	J-K	-.227E-02	-.125E-01	-.389E-03	.000E+00	.000E+00	-.407E+04	-.593E+04	-.366E+04	-.352E+02	.000E+00	.000E+00
	K-L	-.228E-02	-.124E-01	-.705E-03	.000E+00	.000E+00	-.404E+04	-.587E+04	-.363E+04	-.637E+02	.000E+00	.000E+00
	L-I	-.227E-02	-.123E-01	-.368E-03	.000E+00	.000E+00	-.401E+04	-.582E+04	-.360E+04	-.333E+02	.000E+00	.000E+00
2	CEN	-.175E-02	-.129E-01	-.113E-02	.000E+00	.000E+00	-.396E+04	-.595E+04	-.364E+04	-.101E+03	.000E+00	.000E+00
	I-J	-.199E-02	-.130E-01	.702E-04	.000E+00	.000E+00	-.408E+04	-.605E+04	-.372E+04	.628E+01	.000E+00	.000E+00
	J-K	-.174E-02	-.133E-01	-.107E-02	.000E+00	.000E+00	-.406E+04	-.613E+04	-.375E+04	-.956E+02	.000E+00	.000E+00
	K-L	-.154E-02	-.128E-01	-.216E-02	.000E+00	.000E+00	-.385E+04	-.587E+04	-.357E+04	-.193E+03	.000E+00	.000E+00
	L-I	-.176E-02	-.125E-01	-.118E-02	.000E+00	.000E+00	-.386E+04	-.578E+04	-.354E+04	-.106E+03	.000E+00	.000E+00
3	CEN	-.955E-03	-.138E-01	-.134E-02	.000E+00	.000E+00	-.388E+04	-.615E+04	-.371E+04	-.118E+03	.000E+00	.000E+00
	I-J	-.115E-02	-.140E-01	.151E-03	.000E+00	.000E+00	-.401E+04	-.628E+04	-.381E+04	.133E+02	.000E+00	.000E+00
	J-K	-.950E-03	-.144E-01	-.131E-02	.000E+00	.000E+00	-.401E+04	-.638E+04	-.385E+04	-.115E+03	.000E+00	.000E+00
	K-L	-.787E-03	-.137E-01	-.263E-02	.000E+00	.000E+00	-.376E+04	-.603E+04	-.362E+04	-.231E+03	.000E+00	.000E+00
	L-I	-.959E-03	-.133E-01	-.138E-02	.000E+00	.000E+00	-.375E+04	-.592E+04	-.358E+04	-.122E+03	.000E+00	.000E+00
4	CEN	-.508E-06	-.150E-01	-.905E-03	.000E+00	.000E+00	-.381E+04	-.642E+04	-.381E+04	-.785E+02	.000E+00	.000E+00
	I-J	-.785E-04	-.151E-01	.898E-04	.000E+00	.000E+00	-.387E+04	-.647E+04	-.385E+04	.779E+01	.000E+00	.000E+00
	J-K	-.508E-06	-.156E-01	-.861E-03	.000E+00	.000E+00	-.395E+04	-.666E+04	-.395E+04	-.747E+02	.000E+00	.000E+00
	K-L	.110E-03	-.149E-01	-.232E-02	.000E+00	.000E+00	-.374E+04	-.634E+04	-.376E+04	-.201E+03	.000E+00	.000E+00
	L-I	-.508E-06	-.145E-01	-.949E-03	.000E+00	.000E+00	-.367E+04	-.618E+04	-.367E+04	-.823E+02	.000E+00	.000E+00
5	CEN	.665E-03	-.159E-01	-.419E-03	.000E+00	.000E+00	-.377E+04	-.655E+04	-.389E+04	-.351E+02	.000E+00	.000E+00
	I-J	.664E-03	-.158E-01	.128E-03	.000E+00	.000E+00	-.376E+04	-.653E+04	-.387E+04	.107E+02	.000E+00	.000E+00
	J-K	.665E-03	-.162E-01	-.418E-03	.000E+00	.000E+00	-.385E+04	-.668E+04	-.396E+04	-.351E+02	.000E+00	.000E+00
	K-L	.666E-03	-.159E-01	-.120E-02	.000E+00	.000E+00	-.379E+04	-.658E+04	-.390E+04	-.100E+03	.000E+00	.000E+00
	L-I	.665E-03	-.156E-01	-.420E-03	.000E+00	.000E+00	-.370E+04	-.642E+04	-.381E+04	-.352E+02	.000E+00	.000E+00
6	CEN	.968E-03	-.163E-01	-.259E-03	.000E+00	.000E+00	-.376E+04	-.661E+04	-.392E+04	-.214E+02	.000E+00	.000E+00
	I-J	.996E-03	-.162E-01	.177E-03	.000E+00	.000E+00	-.373E+04	-.657E+04	-.389E+04	.146E+02	.000E+00	.000E+00
	J-K	.968E-03	-.164E-01	-.266E-03	.000E+00	.000E+00	-.378E+04	-.665E+04	-.394E+04	-.219E+02	.000E+00	.000E+00
	K-L	.940E-03	-.163E-01	-.691E-03	.000E+00	.000E+00	-.379E+04	-.664E+04	-.394E+04	-.571E+02	.000E+00	.000E+00
	L-I	.968E-03	-.162E-01	-.253E-03	.000E+00	.000E+00	-.374E+04	-.657E+04	-.390E+04	-.209E+02	.000E+00	.000E+00
7	CEN	.110E-02	-.164E-01	-.186E-03	.000E+00	.000E+00	-.375E+04	-.663E+04	-.393E+04	-.152E+02	.000E+00	.000E+00
	I-J	.113E-02	-.164E-01	.187E-03	.000E+00	.000E+00	-.372E+04	-.659E+04	-.391E+04	.153E+02	.000E+00	.000E+00
	J-K	.110E-02	-.165E-01	-.193E-03	.000E+00	.000E+00	-.377E+04	-.667E+04	-.395E+04	-.158E+02	.000E+00	.000E+00
	K-L	.106E-02	-.165E-01	-.642E-03	.000E+00	.000E+00	-.379E+04	-.668E+04	-.396E+04	-.527E+02	.000E+00	.000E+00
	L-I	.110E-02	-.164E-01	-.178E-03	.000E+00	.000E+00	-.373E+04	-.660E+04	-.391E+04	-.146E+02	.000E+00	.000E+00
8	CEN	.119E-02	-.166E-01	-.123E-03	.000E+00	.000E+00	-.376E+04	-.666E+04	-.395E+04	-.101E+02	.000E+00	.000E+00
	I-J	.128E-02	-.165E-01	.189E-03	.000E+00	.000E+00	-.370E+04	-.661E+04	-.391E+04	.154E+02	.000E+00	.000E+00
	J-K	.119E-02	-.166E-01	-.143E-03	.000E+00	.000E+00	-.377E+04	-.669E+04	-.397E+04	-.117E+02	.000E+00	.000E+00
	K-L	.111E-02	-.166E-01	-.400E-03	.000E+00	.000E+00	-.380E+04	-.670E+04	-.398E+04	-.327E+02	.000E+00	.000E+00
	L-I	.119E-02	-.165E-01	-.103E-03	.000E+00	.000E+00	-.374E+04	-.663E+04	-.393E+04	-.846E+01	.000E+00	.000E+00
9	CEN	.128E-02	-.167E-01	-.143E-03	.000E+00	.000E+00	-.375E+04	-.668E+04	-.396E+04	-.116E+02	.000E+00	.000E+00
	I-J	.141E-02	-.166E-01	.160E-03	.000E+00	.000E+00	-.369E+04	-.663E+04	-.392E+04	.130E+02	.000E+00	.000E+00
	J-K	.128E-02	-.168E-01	-.172E-03	.000E+00	.000E+00	-.377E+04	-.671E+04	-.398E+04	-.140E+02	.000E+00	.000E+00
	K-L	.117E-02	-.167E-01	-.397E-03	.000E+00	.000E+00	-.381E+04	-.672E+04	-.400E+04	-.323E+02	.000E+00	.000E+00
	L-I	.128E-02	-.166E-01	-.114E-03	.000E+00	.000E+00	-.374E+04	-.665E+04	-.395E+04	-.929E+01	.000E+00	.000E+00
10	CEN	.135E-02	-.168E-01	-.584E-04	.000E+00	.000E+00	-.375E+04	-.669E+04	-.397E+04	-.474E+01	.000E+00	.000E+00
	I-J	.146E-02	-.167E-01	.108E-03	.000E+00	.000E+00	-.369E+04	-.665E+04	-.393E+04	.876E+01	.000E+00	.000E+00
	J-K	.135E-02	-.168E-01	-.832E-04	.000E+00	.000E+00	-.375E+04	-.670E+04	-.397E+04	-.676E+01	.000E+00	.000E+00
	K-L	.126E-02	-.168E-01	-.198E-03	.000E+00	.000E+00	-.379E+04	-.672E+04	-.399E+04	-.161E+02	.000E+00	.000E+00
	L-I	.135E-02	-.167E-01	-.336E-04	.000E+00	.000E+00	-.374E+04	-.667E+04	-.396E+04	-.273E+01	.000E+00	.000E+00
11	CEN	.136E-02	-.168E-01	.600E-05	.000E+00	.000E+00	-.375E+04	-.670E+04	-.397E+04	.486E+00	.000E+00	.000E+00
	I-J	.153E-02	-.168E-01	.432E-04	.000E+00	.000E+00	-.368E+04	-.665E+04	-.393E+04	.350E+01	.000E+00	.000E+00
	J-K	.136E-02	-.168E-01	-.297E-04	.000E+00	.000E+00	-.375E+04	-.670E+04	-.397E+04	-.241E+01	.000E+00	.000E+00
	K-L	.125E-02	-.168E-01	-.203E-04	.000E+00	.000E+00	-.380E+04	-.673E+04	-.400E+04	-.164E+01	.000E+00	.000E+00
	L-I	.136E-02	-.168E-01	.417E-04	.000E+00	.000E+00	-.375E+04	-.669E+04	-.397E+04	.339E+01	.000E+00	.000E+00
12	CEN	-.157E-02	-.609E-02	-.195E-02	.000E+00	.000E+00	-.181E+04	-.256E+04	-.155E+04	-.160E+03	.000E+00	.000E+00
	I-J	-.225E-02	-.612E-02	.324E-03	.000E+00	.000E+00	-.207E+04	-.270E+04	-.170E+04	.266E+02	.000E+00	.000E+00
	J-K	-.145E-02	-.713E-02	-.201E-02	.000E+00	.000E+00	-.198E+04	-.291E+04	-.174E+04	-.165E+03	.000E+00	.000E+00
	K-L	-.930E-03	-.607E-02	-.407E-02	.000E+00	.000E+00	-.157E+04	-.242E+04	-.142E+04	-.334E+03	.000E+00	.000E+00
	L-I	-.166E-02	-.524E-02	-.190E-02	.000E+00	.000E+00	-.167E+04	-.226E+04	-.140E+04	-.156E+03	.000E+00	.000E+00
13	CEN	-.111E-02	-.799E-02	-.281E-02	.000E+00	.000E+00	-.213E+04	-.329E+04	-.195E+04	-.236E+03	.000E+00	.000E+00
	I-J	-.146E-02	-.808E-02	-.885E-03	.000E+00	.000E+00	-.229E+04	-.340E+04	-.204E+04	-.743E+02	.000E+00	.000E+00
	J-K	-.103E-02	-.911E-02	-.301E-02	.000E+00	.000E+00	-.235E+04	-.370E+04	-.217E+04	-.253E+03	.000E+00	.000E+00
	K-L	-.782E-03	-.790E-02	-.458E-02	.000E+00	.000E+00	-.199E+04	-.319E+04	-.186E+04	-.384E+03	.000E+00	.000E+00
	L-I	-.116E-02	-.711E-02	-.265E-02	.000E+00	.000E+00	-.197E+04	-.297E+04	-.177E+04	-.223E+03	.000E+00	.000E+00
14	CEN	-.490E-03	-.984E-02	-.240E-02	.000E+00	.000E+00	-.239E+04	-.398E+04	-.231E+04	-.203E+03	.000E+00	.000E+00
	I-J	-.676E-03	-.997E-02	-.126E-02	.000E+00	.000E+00	-.249E+04	-.407E+04	-.238E+04	-.107E+03	.000E+00	.000E+00
	J-K	-.434E-03	-.108E-01	-.258E-02	.000E+00	.000E+00	-.258E+04	-.433E+04	-.251E+04	-.219E+03	.000E+00	.000E+00
	K-L	-.324E-03	-.973E-02	-.342E-02	.000E+00	.000E+00	-.230E+04	-.390E+04	-.225E+04	-.290E+03	.000E+00	.000E+00
	L-I	-.530E-03	-.917E-02	-.227E-02	.000E+00	.000E+00	-.226E+04	-.372E+04	-.217E+04	-.192E+03	.000E+00	.000E+00
15	CEN	.601E-04	-.112E-01	-.163E-02	.000E+00	.000E+00	-.254E+04	-.443E+04	-.255E+04	-.137E+03	.000E+00	.000E+00
	I-J	.110E-03	-.112E-01	-.136E-02	.000E+00	.000E+00	-.252E+04	-.443E+04	-.254E+04	-.115E+03	.000E+00	.000E+00
	J-K	.601E-04	-.114E-01	-.167E-02	.000E+00	.000E+00	-.258E+04	-.451E+04	-.259E+04	-.141E+03	.000E+00	.000E+00
	K-L	-.340E-05	-.111E-01	-.196E-02	.000E+00	.000E+00	-.255E+04	-.443E+04	-.255E+04	-.166E+03	.000E+00	.000E+00
	L-I	.601E-04	-.109E-01	-.159E-02	.000E+00	.000E+00	-.249E+04	-.434E+04	-.250E+04	-.134E+03	.000E+00	.000E+00
16	CEN	.540E-03	-.117E-01	-.888E-03	.000E+00	.000E+00	-.248E+04	-.450E+04	-.257E+04	-.731E+02	.000E+00	.000E+00
	I-J	.666E-03	-.117E-01	-.422E-03	.000E+00	.000E+00	-.242E+04	-.446E+04	-.253E+04	-.347E+02	.000E+00	.000E+00
	J-K	.540E-03	-.121E-01	-.988E-03	.000E+00	.000E+00	-.256E+04	-.464E+04	-.265E+04	-.814E+02	.000E+00	.000E+00
	K-L	.381E-03	-.118E-01	-.148E-02	.000E+00	.000E+00	-.255E+04	-.456E+04	-.262E+04	-.122E+03	.000E+00	.000E+00
	L-I	.540E-03	-.114E-01	-.788E-03	.000E+00	.000E+00	-.240E+04	-.436E+04	-.249E+04	-.649E+02	.000E+00	.000E+00
17	CEN	.830E-03	-.122E-01	-.430E-03	.000E+00	.000E+00	-.248E+04	-.459E+04	-.261E+04	-.350E+02	.000E+00	.000E+00
	I-J	.940E-03	-.121E-01	-.414E-04	.000E+00	.000E+00	-.241E+04	-.453E+04	-.257E+04	-.336E+01	.000E+00	.000E+00
	J-K	.830E-03	-.123E-01	-.479E-03	.000E+00	.000E+00	-.251E+04	-.465E+04	-.265E+04	-.389E+02	.000E+00	.000E+00
	K-L	.658E-03	-.123E-01	-.104E-02	.000E+00	.000E+00	-.258E+04	-.468E+04	-.268E+04	-.846E+02	.000E+00	.000E+00
	L-I	.830E-03	-.120E-01	-.382E-03	.000E+00	.000E+00	-.244E+04	-.452E+04	-.257E+04	-.310E+02	.000E+00	.000E+00

18	CEN	.938E-03	-.123E-01	-.300E-03	.000E+00	.000E+00	-.248E+04	-.463E+04	-.263E+04	-.243E+02	.000E+00	.000E+00
	I-J	.106E-02	-.123E-01	-.367E-04	.000E+00	.000E+00	-.242E+04	-.457E+04	-.259E+04	-.297E+01	.000E+00	.000E+00
	J-K	.938E-03	-.124E-01	-.344E-03	.000E+00	.000E+00	-.250E+04	-.466E+04	-.265E+04	-.278E+02	.000E+00	.000E+00
	K-L	.782E-03	-.124E-01	-.640E-03	.000E+00	.000E+00	-.257E+04	-.470E+04	-.269E+04	-.517E+02	.000E+00	.000E+00
	L-I	.938E-03	-.123E-01	-.257E-03	.000E+00	.000E+00	-.246E+04	-.460E+04	-.262E+04	-.208E+02	.000E+00	.000E+00
19	CEN	.101E-02	-.124E-01	-.118E-03	.000E+00	.000E+00	-.248E+04	-.464E+04	-.264E+04	-.952E+01	.000E+00	.000E+00
	I-J	.111E-02	-.123E-01	.154E-03	.000E+00	.000E+00	-.242E+04	-.458E+04	-.260E+04	.124E+02	.000E+00	.000E+00
	J-K	.101E-02	-.126E-01	-.165E-03	.000E+00	.000E+00	-.250E+04	-.469E+04	-.267E+04	-.133E+02	.000E+00	.000E+00
	K-L	.929E-03	-.125E-01	-.363E-03	.000E+00	.000E+00	-.253E+04	-.469E+04	-.268E+04	-.292E+02	.000E+00	.000E+00
	L-I	.101E-02	-.123E-01	-.716E-04	.000E+00	.000E+00	-.245E+04	-.460E+04	-.261E+04	-.576E+01	.000E+00	.000E+00
20	CEN	.106E-02	-.125E-01	.974E-05	.000E+00	.000E+00	-.248E+04	-.466E+04	-.265E+04	.782E+00	.000E+00	.000E+00
	I-J	.117E-02	-.125E-01	.105E-03	.000E+00	.000E+00	-.243E+04	-.462E+04	-.262E+04	.842E+01	.000E+00	.000E+00
	J-K	.106E-02	-.125E-01	-.447E-04	.000E+00	.000E+00	-.248E+04	-.467E+04	-.265E+04	-.359E+01	.000E+00	.000E+00
	K-L	.975E-03	-.125E-01	-.722E-04	.000E+00	.000E+00	-.251E+04	-.468E+04	-.267E+04	-.579E+01	.000E+00	.000E+00
	L-I	.106E-02	-.125E-01	.641E-04	.000E+00	.000E+00	-.247E+04	-.464E+04	-.264E+04	.515E+01	.000E+00	.000E+00
21	CEN	.101E-02	-.126E-01	-.706E-04	.000E+00	.000E+00	-.253E+04	-.473E+04	-.269E+04	-.570E+01	.000E+00	.000E+00
	I-J	.126E-02	-.126E-01	.164E-03	.000E+00	.000E+00	-.242E+04	-.466E+04	-.263E+04	.133E+02	.000E+00	.000E+00
	J-K	.101E-02	-.127E-01	-.202E-03	.000E+00	.000E+00	-.255E+04	-.477E+04	-.272E+04	-.163E+02	.000E+00	.000E+00
	K-L	.792E-03	-.126E-01	-.273E-03	.000E+00	.000E+00	-.262E+04	-.479E+04	-.275E+04	-.220E+02	.000E+00	.000E+00
	L-I	.101E-02	-.125E-01	.605E-04	.000E+00	.000E+00	-.251E+04	-.469E+04	-.267E+04	.489E+01	.000E+00	.000E+00
22	CEN	.104E-02	-.126E-01	.101E-03	.000E+00	.000E+00	-.252E+04	-.472E+04	-.269E+04	.812E+01	.000E+00	.000E+00
	I-J	.125E-02	-.126E-01	.101E-03	.000E+00	.000E+00	-.244E+04	-.467E+04	-.264E+04	.814E+01	.000E+00	.000E+00
	J-K	.104E-02	-.126E-01	-.315E-04	.000E+00	.000E+00	-.252E+04	-.471E+04	-.268E+04	-.254E+01	.000E+00	.000E+00
	K-L	.871E-03	-.126E-01	.101E-03	.000E+00	.000E+00	-.258E+04	-.476E+04	-.272E+04	.811E+01	.000E+00	.000E+00
	L-I	.104E-02	-.126E-01	.233E-03	.000E+00	.000E+00	-.252E+04	-.472E+04	-.269E+04	.188E+02	.000E+00	.000E+00
23	CEN	-.102E-02	-.199E-02	-.314E-02	.000E+00	.000E+00	-.614E+03	-.733E+03	-.490E+03	-.191E+03	.000E+00	.000E+00
	I-J	-.890E-03	-.333E-02	-.239E-02	.000E+00	.000E+00	-.796E+03	-.109E+04	-.688E+03	-.146E+03	.000E+00	.000E+00
	J-K	-.114E-02	-.355E-02	-.424E-02	.000E+00	.000E+00	-.903E+03	-.120E+04	-.765E+03	-.258E+03	.000E+00	.000E+00
	K-L	-.120E-02	-.822E-04	-.420E-02	.000E+00	.000E+00	-.355E+03	-.219E+03	-.209E+03	-.256E+03	.000E+00	.000E+00
	L-I	-.890E-03	-.363E-03	-.199E-02	.000E+00	.000E+00	-.313E+03	-.248E+03	-.204E+03	-.121E+03	.000E+00	.000E+00
24	CEN	-.778E-03	-.497E-02	-.426E-02	.000E+00	.000E+00	-.121E+04	-.184E+04	-.110E+04	-.318E+03	.000E+00	.000E+00
	I-J	-.955E-03	-.548E-02	-.344E-02	.000E+00	.000E+00	-.137E+04	-.204E+04	-.123E+04	-.257E+03	.000E+00	.000E+00
	J-K	-.652E-03	-.584E-02	-.453E-02	.000E+00	.000E+00	-.133E+04	-.211E+04	-.124E+04	-.338E+03	.000E+00	.000E+00
	K-L	-.529E-03	-.425E-02	-.542E-02	.000E+00	.000E+00	-.990E+03	-.155E+04	-.911E+03	-.404E+03	.000E+00	.000E+00
	L-I	-.910E-03	-.407E-02	-.398E-02	.000E+00	.000E+00	-.108E+04	-.156E+04	-.949E+03	-.297E+03	.000E+00	.000E+00
25	CEN	-.253E-03	-.743E-02	-.336E-02	.000E+00	.000E+00	-.162E+04	-.276E+04	-.158E+04	-.267E+03	.000E+00	.000E+00
	I-J	-.492E-03	-.768E-02	-.250E-02	.000E+00	.000E+00	-.176E+04	-.290E+04	-.168E+04	-.199E+03	.000E+00	.000E+00
	J-K	-.117E-03	-.822E-02	-.357E-02	.000E+00	.000E+00	-.174E+04	-.302E+04	-.172E+04	-.284E+03	.000E+00	.000E+00
	K-L	.782E-04	-.708E-02	-.456E-02	.000E+00	.000E+00	-.143E+04	-.257E+04	-.144E+04	-.363E+03	.000E+00	.000E+00
	L-I	-.394E-03	-.661E-02	-.315E-02	.000E+00	.000E+00	-.150E+04	-.249E+04	-.144E+04	-.250E+03	.000E+00	.000E+00
26	CEN	.168E-03	-.860E-02	-.239E-02	.000E+00	.000E+00	-.175E+04	-.315E+04	-.178E+04	-.191E+03	.000E+00	.000E+00
	I-J	-.340E-05	-.863E-02	-.207E-02	.000E+00	.000E+00	-.182E+04	-.320E+04	-.182E+04	-.165E+03	.000E+00	.000E+00
	J-K	.168E-03	-.880E-02	-.229E-02	.000E+00	.000E+00	-.180E+04	-.323E+04	-.182E+04	-.182E+03	.000E+00	.000E+00
	K-L	.402E-03	-.856E-02	-.284E-02	.000E+00	.000E+00	-.166E+04	-.309E+04	-.172E+04	-.227E+03	.000E+00	.000E+00
	L-I	.168E-03	-.840E-02	-.250E-02	.000E+00	.000E+00	-.171E+04	-.308E+04	-.174E+04	-.200E+03	.000E+00	.000E+00
27	CEN	.418E-03	-.896E-02	-.158E-02	.000E+00	.000E+00	-.174E+04	-.323E+04	-.181E+04	-.125E+03	.000E+00	.000E+00
	I-J	.381E-03	-.894E-02	-.131E-02	.000E+00	.000E+00	-.175E+04	-.323E+04	-.181E+04	-.104E+03	.000E+00	.000E+00
	J-K	.418E-03	-.913E-02	-.155E-02	.000E+00	.000E+00	-.178E+04	-.329E+04	-.185E+04	-.123E+03	.000E+00	.000E+00
	K-L	.468E-03	-.899E-02	-.194E-02	.000E+00	.000E+00	-.173E+04	-.323E+04	-.181E+04	-.153E+03	.000E+00	.000E+00
	L-I	.418E-03	-.880E-02	-.160E-02	.000E+00	.000E+00	-.171E+04	-.317E+04	-.177E+04	-.126E+03	.000E+00	.000E+00
28	CEN	.560E-03	-.914E-02	-.104E-02	.000E+00	.000E+00	-.173E+04	-.325E+04	-.182E+04	-.820E+02	.000E+00	.000E+00
	I-J	.658E-03	-.908E-02	-.702E-03	.000E+00	.000E+00	-.168E+04	-.321E+04	-.178E+04	-.551E+02	.000E+00	.000E+00
	J-K	.560E-03	-.923E-02	-.107E-02	.000E+00	.000E+00	-.175E+04	-.329E+04	-.184E+04	-.842E+02	.000E+00	.000E+00
	K-L	.439E-03	-.921E-02	-.146E-02	.000E+00	.000E+00	-.179E+04	-.331E+04	-.186E+04	-.115E+03	.000E+00	.000E+00
	L-I	.560E-03	-.905E-02	-.102E-02	.000E+00	.000E+00	-.171E+04	-.322E+04	-.180E+04	-.798E+02	.000E+00	.000E+00
29	CEN	.628E-03	-.924E-02	-.675E-03	.000E+00	.000E+00	-.173E+04	-.327E+04	-.182E+04	-.529E+02	.000E+00	.000E+00
	I-J	.782E-03	-.915E-02	-.266E-03	.000E+00	.000E+00	-.165E+04	-.321E+04	-.177E+04	-.208E+02	.000E+00	.000E+00
	J-K	.628E-03	-.934E-02	-.717E-03	.000E+00	.000E+00	-.175E+04	-.331E+04	-.185E+04	-.562E+02	.000E+00	.000E+00
	K-L	.438E-03	-.935E-02	-.118E-02	.000E+00	.000E+00	-.182E+04	-.335E+04	-.189E+04	-.926E+02	.000E+00	.000E+00
	L-I	.628E-03	-.914E-02	-.632E-03	.000E+00	.000E+00	-.170E+04	-.323E+04	-.180E+04	-.495E+02	.000E+00	.000E+00
30	CEN	.695E-03	-.941E-02	-.449E-03	.000E+00	.000E+00	-.174E+04	-.332E+04	-.185E+04	-.352E+02	.000E+00	.000E+00
	I-J	.929E-03	-.933E-02	-.864E-04	.000E+00	.000E+00	-.164E+04	-.325E+04	-.179E+04	-.676E+01	.000E+00	.000E+00
	J-K	.695E-03	-.957E-02	-.578E-03	.000E+00	.000E+00	-.178E+04	-.339E+04	-.189E+04	-.452E+02	.000E+00	.000E+00
	K-L	.476E-03	-.948E-02	-.790E-03	.000E+00	.000E+00	-.184E+04	-.340E+04	-.191E+04	-.618E+02	.000E+00	.000E+00
	L-I	.695E-03	-.924E-02	-.321E-03	.000E+00	.000E+00	-.171E+04	-.326E+04	-.182E+04	-.251E+02	.000E+00	.000E+00
31	CEN	.750E-03	-.946E-02	-.828E-04	.000E+00	.000E+00	-.173E+04	-.333E+04	-.185E+04	-.646E+01	.000E+00	.000E+00
	I-J	.975E-03	-.945E-02	.171E-04	.000E+00	.000E+00	-.165E+04	-.327E+04	-.180E+04	.134E+01	.000E+00	.000E+00
	J-K	.750E-03	-.949E-02	-.220E-03	.000E+00	.000E+00	-.174E+04	-.334E+04	-.186E+04	-.172E+02	.000E+00	.000E+00
	K-L	.544E-03	-.947E-02	-.174E-03	.000E+00	.000E+00	-.181E+04	-.337E+04	-.190E+04	-.136E+02	.000E+00	.000E+00
	L-I	.750E-03	-.943E-02	.545E-04	.000E+00	.000E+00	-.173E+04	-.331E+04	-.184E+04	.425E+01	.000E+00	.000E+00
32	CEN	.651E-03	-.906E-02	.283E-03	.000E+00	.000E+00	-.167E+04	-.318E+04	-.177E+04	.221E+02	.000E+00	.000E+00
	I-J	.792E-03	-.913E-02	-.232E-03	.000E+00	.000E+00	-.163E+04	-.318E+04	-.175E+04	-.181E+02	.000E+00	.000E+00
	J-K	.671E-03	-.884E-02	.150E-03	.000E+00	.000E+00	-.161E+04	-.310E+04	-.172E+04	.117E+02	.000E+00	.000E+00
	K-L	.532E-03	-.901E-02	.719E-03	.000E+00	.000E+00	-.170E+04	-.319E+04	-.178E+04	.561E+02	.000E+00	.000E+00
	L-I	.624E-03	-.937E-02	.467E-03	.000E+00	.000E+00	-.174E+04	-.330E+04	-.184E+04	.364E+02	.000E+00	.000E+00
33	CEN	.648E-03	-.914E-02	-.320E-03	.000E+00	.000E+00	-.169E+04	-.322E+04	-.179E+04	-.250E+02	.000E+00	.000E+00
	I-J	.871E-03	-.912E-02	.174E-03	.000E+00	.000E+00	-.160E+04	-.316E+04	-.174E+04	.136E+02	.000E+00	.000E+00
	J-K	.603E-03	-.953E-02	-.596E-03	.000E+00	.000E+00	-.179E+04	-.337E+04	-.188E+04	-.466E+02	.000E+00	.000E+00
	K-L	.449E-03	-.916E-02	-.759E-03	.000E+00	.000E+00	-.177E+04	-.327E+04	-.184E+04	-.593E+02	.000E+00	.000E+00
	L-I	.680E-03	-.886E-02	-.122E-03	.000E+00	.000E+00	-.162E+04	-.311E+04	-.173E+04	-.956E+01	.000E+00	.000E+00
34	CEN	-.343E-03	-.180E-02	-.327E-02	.000E+00	.000E+00	-.346E+03	-.488E+03	-.313E+03	-.158E+03	.000E+00	.000E+00
	I-J	.334E-05	-.252E-02	-.327E-02	.000E+00	.000E+00	-.366E+03	-.611E+03	-.367E+03	-.159E+03	.000E+00	.000E+00
	J-K	-.555E-03	-.242E-02	-.400E-02	.000E+00	.000E+00	-.487E+03	-.668E+03	-.434E+03	-.194E+03	.000E+00	.000E+00
	K-L	-.947E-03	-.562E-03	-.326E-02	.000E+00	.000E+00	-.312E+03	-.274E+03	-.220E+03	-.158E+03	.000E+00	.000E+00
	L-I	-.117E-03	-.115E-02	-.249E-02	.000E+00	.000E+00	-.196E+03	-.296E+03	-.185E+03	-.121E+03	.000E+00	.000E+00
35	CEN	.211E-03	-.412E-02	-.407E-02	.000E+00	.000E+00	-.637E+03	-.116E+04	-.662E+03	-.244E+03	.000E+00	.000E+00
	I-J	.406E-03	-.444E-02	-.378E-02	.000E+00	.000E+00	-.635E+03	-.122E+04	-.683E+03	-.227E+03	.000E+00	.000E+00
	J-K	.122E-03	-.452E-02	-.444E-02	.000E+00	.000E+00	-.730E+03	-.129E+04	-.745E+03	-.267E+03	.000E+00	.000E+00
	K-L	-.119E-03	-.358E-02	-.455E-02	.000E+00	.000E+00	-.641E+03	-.106E+04	-.627E+03	-.273E+03	.000E+00	.000E+00
	L-I	.305E-03	-.370E-02	-.367E-02	.000E+00	.000E+00	-.538E+03	-.102E+04	-.575E+03	-.220E+03	.000E+00	.000E+00
36	CEN	.517E-03	-.567E-02	-.334E-02	.000E+00	.000E+00	-.874E+03	-.170E+04	-.943E+03	-.223E+03	.000E+00	.000E+00
	I-J	.602E-03	-.581E-02	-.291E-02	.000E+00	.000E+00	-.873E+03	-.173E+04	-.954E+03	-.194E+03	.000E+00	.000E+00
	J-K	.486E-03	-.600E-02	-.356E-02	.000E+00	.000E+00	-.945E+03	-.181E+04	-.101E+04	-.238E+03	.000E+00	.000E+00
	K-L	.377E-03	-.543E-02	-.404E-02	.000E+00	.000E+00	-.874E+03	-.165E+04	-.925E+03	-.270E+03	.000E+00	.000E+00
	L-I	.549E-03	-.531E-02	-.310E-02	.000E+00	.000E+00	-.799E+03	-.158E+04	-.872E+03	-.207E+03	.000E+00	.000E+00
37	CEN	.499E-03	-.622E-02	-.228E-02	.000E+00	.000E+00	-.101E+04	-.196E+04	-.108E+04	-.161E+03	.000E+00	.000E+00
	I-J	.402E-03	-.623E-02	-.223E-02	.000E+00	.000E+00	-.104E+04	-.198E+04	-.110E+04	-.158E+03	.000E+00	.000E+00
	J-K	.499E-03	-.624E-02	-.223E-02	.000E+00	.000E+00	-.101E+04	-.197E+04	-.108E+04	-.158E+03	.000E+00	.000E+00
	K-L	.651E-03	-.622E-02	-.234E-02	.000E+00	.000E+00	-.960E+03	-.193E+04	-.105E+04	-.165E+03	.000E+00	.000E+00
	L-I	.499E-03	-.621E-02	-.232E-02	.000E+00	.000E+00	-.101E+04	-.195E+04	-.108E+04	-.164E+03	.000E+00	.000E+00
38	CEN	.477E-03	-.625E-02	-.147E-02	.000E+00	.000E+00	-.102E+04	-.199E+04	-.109E+04	-.105E+03	.000E+00	.000E+00
	I-J	.468E-03	-.625E-02	-.145E-02	.000E+00	.000E+00	-.103E+04	-.199E+04	-.109E+04	-.103E+03	.000E+00	.000E+00
	J-K	.477E-03	-.626E-02	-.147E-02	.000E+00	.000E+00	-.103E+04	-.199E+04	-.109E+04	-.105E+03	.000E+00	.000E+00
	K-L	.492E-03	-.625E-02	-.150E-02	.000E+00	.000E+00	-.102E+04	-.198E+04	-.109E+04	-.107E+03	.000E+00	.000E+00
	L-I	.477E-03	-.624E-02	-.147E-02	.000E+00	.000E+00	-.102E+04	-.198E+04	-.109E+04	-.105E+03	.000E+00	.000E+00

39	CEN	.385E-03	-.618E-02	-.991E-03	.000E+00	.000E+00	-.105E+04	-.200E+04	-.110E+04	-.718E+02	.000E+00	.000E+00
	I-J	.439E-03	-.618E-02	-.977E-03	.000E+00	.000E+00	-.103E+04	-.199E+04	-.109E+04	-.708E+02	.000E+00	.000E+00
	J-K	.385E-03	-.618E-02	-.100E-02	.000E+00	.000E+00	-.105E+04	-.200E+04	-.110E+04	-.727E+02	.000E+00	.000E+00
	K-L	.316E-03	-.618E-02	-.101E-02	.000E+00	.000E+00	-.107E+04	-.201E+04	-.111E+04	-.731E+02	.000E+00	.000E+00
	L-I	.385E-03	-.618E-02	-.979E-03	.000E+00	.000E+00	-.105E+04	-.200E+04	-.110E+04	-.709E+02	.000E+00	.000E+00
40	CEN	.319E-03	-.611E-02	-.719E-03	.000E+00	.000E+00	-.106E+04	-.200E+04	-.110E+04	-.525E+02	.000E+00	.000E+00
	I-J	.438E-03	-.610E-02	-.651E-03	.000E+00	.000E+00	-.101E+04	-.197E+04	-.108E+04	-.475E+02	.000E+00	.000E+00
	J-K	.319E-03	-.612E-02	-.745E-03	.000E+00	.000E+00	-.106E+04	-.200E+04	-.110E+04	-.544E+02	.000E+00	.000E+00
	K-L	.162E-03	-.613E-02	-.808E-03	.000E+00	.000E+00	-.111E+04	-.203E+04	-.114E+04	-.590E+02	.000E+00	.000E+00
	L-I	.319E-03	-.611E-02	-.692E-03	.000E+00	.000E+00	-.105E+04	-.199E+04	-.110E+04	-.505E+02	.000E+00	.000E+00
41	CEN	.200E-03	-.599E-02	-.386E-03	.000E+00	.000E+00	-.107E+04	-.199E+04	-.110E+04	-.286E+02	.000E+00	.000E+00
	I-J	.476E-03	-.598E-02	-.278E-03	.000E+00	.000E+00	-.979E+03	-.193E+04	-.105E+04	-.205E+02	.000E+00	.000E+00
	J-K	.200E-03	-.602E-02	-.549E-03	.000E+00	.000E+00	-.108E+04	-.200E+04	-.111E+04	-.406E+02	.000E+00	.000E+00
	K-L	-.598E-04	-.600E-02	-.488E-03	.000E+00	.000E+00	-.116E+04	-.204E+04	-.116E+04	-.361E+02	.000E+00	.000E+00
	L-I	.200E-03	-.597E-02	-.224E-03	.000E+00	.000E+00	-.107E+04	-.198E+04	-.110E+04	-.165E+02	.000E+00	.000E+00
42	CEN	.183E-03	-.613E-02	-.257E-03	.000E+00	.000E+00	-.111E+04	-.205E+04	-.114E+04	-.191E+02	.000E+00	.000E+00
	I-J	.544E-03	-.606E-02	.175E-03	.000E+00	.000E+00	-.976E+03	-.196E+04	-.106E+04	.130E+02	.000E+00	.000E+00
	J-K	.183E-03	-.637E-02	-.497E-03	.000E+00	.000E+00	-.116E+04	-.213E+04	-.119E+04	-.371E+02	.000E+00	.000E+00
	K-L	-.150E-03	-.620E-02	-.655E-03	.000E+00	.000E+00	-.124E+04	-.214E+04	-.122E+04	-.488E+02	.000E+00	.000E+00
	L-I	.183E-03	-.589E-02	-.164E-04	.000E+00	.000E+00	-.107E+04	-.197E+04	-.109E+04	-.122E+01	.000E+00	.000E+00
43	CEN	.326E-03	-.495E-02	.257E-03	.000E+00	.000E+00	-.785E+03	-.151E+04	-.830E+03	.175E+02	.000E+00	.000E+00
	I-J	.372E-03	-.525E-02	-.146E-02	.000E+00	.000E+00	-.825E+03	-.159E+04	-.876E+03	-.100E+03	.000E+00	.000E+00
	J-K	.347E-03	-.419E-02	-.542E-03	.000E+00	.000E+00	-.642E+03	-.126E+04	-.689E+03	-.370E+02	.000E+00	.000E+00
	K-L	.281E-03	-.465E-02	.196E-02	.000E+00	.000E+00	-.746E+03	-.142E+04	-.785E+03	.134E+03	.000E+00	.000E+00
	L-I	.297E-03	-.603E-02	.139E-02	.000E+00	.000E+00	-.989E+03	-.185E+04	-.103E+04	.950E+02	.000E+00	.000E+00
44	CEN	.175E-03	-.489E-02	.684E-04	.000E+00	.000E+00	-.828E+03	-.153E+04	-.852E+03	.478E+01	.000E+00	.000E+00
	I-J	.535E-03	-.475E-02	.148E-02	.000E+00	.000E+00	-.687E+03	-.143E+04	-.762E+03	.103E+03	.000E+00	.000E+00
	J-K	-.210E-04	-.610E-02	-.999E-03	.000E+00	.000E+00	-.111E+04	-.196E+04	-.111E+04	-.697E+02	.000E+00	.000E+00
	K-L	-.118E-03	-.500E-02	-.108E-02	.000E+00	.000E+00	-.942E+03	-.162E+04	-.925E+03	-.755E+02	.000E+00	.000E+00
	L-I	.328E-03	-.394E-02	.902E-03	.000E+00	.000E+00	-.607E+03	-.120E+04	-.653E+03	.629E+02	.000E+00	.000E+00
45	CEN	-.105E-02	-.882E-04	-.273E-02	.000E+00	.000E+00	-.261E+03	-.171E+03	-.162E+03	-.128E+03	.000E+00	.000E+00
	I-J	-.867E-03	-.199E-03	-.292E-02	.000E+00	.000E+00	-.233E+03	-.171E+03	-.152E+03	-.137E+03	.000E+00	.000E+00
	J-K	-.110E-02	-.151E-03	-.290E-02	.000E+00	.000E+00	-.280E+03	-.192E+03	-.178E+03	-.136E+03	.000E+00	.000E+00
	K-L	-.168E-02	.291E-03	-.206E-02	.000E+00	.000E+00	-.356E+03	-.171E+03	-.198E+03	-.969E+02	.000E+00	.000E+00
	L-I	-.100E-02	-.152E-04	-.253E-02	.000E+00	.000E+00	-.239E+03	-.146E+03	-.145E+03	-.119E+03	.000E+00	.000E+00
46	CEN	-.301E-03	-.169E-02	-.307E-02	.000E+00	.000E+00	-.315E+03	-.446E+03	-.287E+03	-.145E+03	.000E+00	.000E+00
	I-J	.199E-03	-.197E-02	-.312E-02	.000E+00	.000E+00	-.236E+03	-.440E+03	-.254E+03	-.147E+03	.000E+00	.000E+00
	J-K	-.388E-03	-.190E-02	-.343E-02	.000E+00	.000E+00	-.365E+03	-.508E+03	-.329E+03	-.162E+03	.000E+00	.000E+00
	K-L	-.171E-02	-.914E-03	-.293E-02	.000E+00	.000E+00	-.538E+03	-.463E+03	-.377E+03	-.138E+03	.000E+00	.000E+00
	L-I	-.203E-03	-.145E-02	-.266E-02	.000E+00	.000E+00	-.257E+03	-.375E+03	-.238E+03	-.125E+03	.000E+00	.000E+00
47	CEN	.406E-03	-.298E-02	-.242E-02	.000E+00	.000E+00	-.351E+03	-.702E+03	-.393E+03	-.125E+03	.000E+00	.000E+00
	I-J	.705E-03	-.307E-02	-.227E-02	.000E+00	.000E+00	-.288E+03	-.679E+03	-.361E+03	-.117E+03	.000E+00	.000E+00
	J-K	.361E-03	-.310E-02	-.260E-02	.000E+00	.000E+00	-.381E+03	-.740E+03	-.418E+03	-.135E+03	.000E+00	.000E+00
	K-L	-.747E-03	-.263E-02	-.303E-02	.000E+00	.000E+00	-.593E+03	-.788E+03	-.516E+03	-.157E+03	.000E+00	.000E+00
	L-I	.455E-03	-.285E-02	-.223E-02	.000E+00	.000E+00	-.318E+03	-.661E+03	-.365E+03	-.115E+03	.000E+00	.000E+00
48	CEN	.470E-03	-.325E-02	-.133E-02	.000E+00	.000E+00	-.384E+03	-.793E+03	-.436E+03	-.733E+02	.000E+00	.000E+00
	I-J	.651E-03	-.323E-02	-.162E-02	.000E+00	.000E+00	-.332E+03	-.759E+03	-.404E+03	-.889E+02	.000E+00	.000E+00
	J-K	.470E-03	-.317E-02	-.138E-02	.000E+00	.000E+00	-.372E+03	-.772E+03	-.423E+03	-.762E+02	.000E+00	.000E+00
	K-L	.515E-04	-.330E-02	-.671E-03	.000E+00	.000E+00	-.504E+03	-.873E+03	-.510E+03	-.370E+02	.000E+00	.000E+00
	L-I	.470E-03	-.333E-02	-.128E-02	.000E+00	.000E+00	-.396E+03	-.815E+03	-.448E+03	-.703E+02	.000E+00	.000E+00
49	CEN	.294E-03	-.304E-02	-.509E-03	.000E+00	.000E+00	-.401E+03	-.782E+03	-.435E+03	-.290E+02	.000E+00	.000E+00
	I-J	.492E-03	-.308E-02	-.918E-03	.000E+00	.000E+00	-.353E+03	-.760E+03	-.409E+03	-.523E+02	.000E+00	.000E+00
	J-K	.294E-03	-.292E-02	-.567E-03	.000E+00	.000E+00	-.382E+03	-.748E+03	-.415E+03	-.323E+02	.000E+00	.000E+00
	K-L	-.166E-03	-.296E-02	.438E-03	.000E+00	.000E+00	-.514E+03	-.832E+03	-.495E+03	.250E+02	.000E+00	.000E+00
	L-I	.294E-03	-.317E-02	-.451E-03	.000E+00	.000E+00	-.421E+03	-.816E+03	-.455E+03	-.257E+02	.000E+00	.000E+00
50	CEN	.569E-04	-.272E-02	-.317E-04	.000E+00	.000E+00	-.419E+03	-.745E+03	-.425E+03	-.186E+01	.000E+00	.000E+00
	I-J	.316E-03	-.282E-02	-.497E-03	.000E+00	.000E+00	-.363E+03	-.731E+03	-.400E+03	-.291E+02	.000E+00	.000E+00
	J-K	.569E-04	-.263E-02	-.780E-04	.000E+00	.000E+00	-.404E+03	-.719E+03	-.411E+03	-.458E+01	.000E+00	.000E+00
	K-L	-.308E-03	-.258E-02	.624E-03	.000E+00	.000E+00	-.497E+03	-.764E+03	-.461E+03	.366E+02	.000E+00	.000E+00
	L-I	.569E-04	-.282E-02	.146E-04	.000E+00	.000E+00	-.433E+03	-.770E+03	-.440E+03	.858E+00	.000E+00	.000E+00
51	CEN	-.812E-04	-.251E-02	.642E-04	.000E+00	.000E+00	-.422E+03	-.709E+03	-.412E+03	.379E+01	.000E+00	.000E+00
	I-J	.162E-03	-.262E-02	-.325E-03	.000E+00	.000E+00	-.372E+03	-.701E+03	-.391E+03	-.192E+02	.000E+00	.000E+00
	J-K	-.812E-04	-.243E-02	.227E-04	.000E+00	.000E+00	-.410E+03	-.688E+03	-.400E+03	.134E+01	.000E+00	.000E+00
	K-L	-.436E-03	-.235E-02	.632E-03	.000E+00	.000E+00	-.495E+03	-.721E+03	-.443E+03	.374E+02	.000E+00	.000E+00
	L-I	-.812E-04	-.258E-02	.106E-03	.000E+00	.000E+00	-.434E+03	-.730E+03	-.425E+03	.625E+01	.000E+00	.000E+00
52	CEN	-.209E-03	-.233E-02	.931E-04	.000E+00	.000E+00	-.427E+03	-.676E+03	-.402E+03	.547E+01	.000E+00	.000E+00
	I-J	-.598E-04	-.235E-02	.528E-04	.000E+00	.000E+00	-.389E+03	-.658E+03	-.382E+03	.310E+01	.000E+00	.000E+00
	J-K	-.209E-03	-.228E-02	.246E-07	.000E+00	.000E+00	-.419E+03	-.663E+03	-.394E+03	.145E-02	.000E+00	.000E+00
	K-L	-.349E-03	-.231E-02	.131E-03	.000E+00	.000E+00	-.462E+03	-.693E+03	-.421E+03	.771E+01	.000E+00	.000E+00
	L-I	-.209E-03	-.238E-02	.186E-03	.000E+00	.000E+00	-.434E+03	-.690E+03	-.410E+03	.109E+02	.000E+00	.000E+00
53	CEN	-.298E-03	-.214E-02	.144E-03	.000E+00	.000E+00	-.417E+03	-.631E+03	-.383E+03	.835E+01	.000E+00	.000E+00
	I-J	-.150E-03	-.216E-02	.683E-04	.000E+00	.000E+00	-.381E+03	-.614E+03	-.363E+03	.397E+01	.000E+00	.000E+00
	J-K	-.298E-03	-.206E-02	.369E-04	.000E+00	.000E+00	-.405E+03	-.611E+03	-.371E+03	.215E+01	.000E+00	.000E+00
	K-L	-.434E-03	-.212E-02	.214E-03	.000E+00	.000E+00	-.452E+03	-.647E+03	-.401E+03	.124E+02	.000E+00	.000E+00
	L-I	-.298E-03	-.222E-02	.251E-03	.000E+00	.000E+00	-.429E+03	-.652E+03	-.395E+03	.146E+02	.000E+00	.000E+00
54	CEN	-.734E-03	-.158E-02	-.818E-03	.000E+00	.000E+00	-.442E+03	-.538E+03	-.358E+03	-.467E+02	.000E+00	.000E+00
	I-J	-.631E-03	-.171E-02	-.163E-02	.000E+00	.000E+00	-.434E+03	-.557E+03	-.362E+03	-.929E+02	.000E+00	.000E+00
	J-K	-.391E-03	.283E-02	-.412E-02	.000E+00	.000E+00	.333E+03	.700E+03	.377E+03	-.235E+03	.000E+00	.000E+00
	K-L	-.831E-03	-.146E-02	-.537E-04	.000E+00	.000E+00	-.449E+03	-.520E+03	-.354E+03	-.307E+01	.000E+00	.000E+00
	L-I	-.776E-03	-.213E-02	-.409E-03	.000E+00	.000E+00	-.538E+03	-.692E+03	-.449E+03	-.233E+02	.000E+00	.000E+00
55	CEN	-.340E-03	-.166E-02	.638E-03	.000E+00	.000E+00	-.339E+03	-.481E+03	-.302E+03	.344E+02	.000E+00	.000E+00
	I-J	-.273E-03	-.166E-02	.117E-02	.000E+00	.000E+00	-.321E+03	-.471E+03	-.292E+03	.630E+02	.000E+00	.000E+00
	J-K	-.369E-03	-.228E-02	.331E-03	.000E+00	.000E+00	-.439E+03	-.646E+03	-.400E+03	.178E+02	.000E+00	.000E+00
	K-L	-.408E-03	-.166E-02	.108E-03	.000E+00	.000E+00	-.356E+03	-.492E+03	-.312E+03	.584E+01	.000E+00	.000E+00
	L-I	-.129E-03	.283E-02	.287E-02	.000E+00	.000E+00	.393E+03	.712E+03	.407E+03	.155E+03	.000E+00	.000E+00

**BANDWIDTH OF MATRIX = 60 IN INCR= 2

SOLUTION CONVERGED AFTER 3 ITERATIONS
RESULTING ERROR IS .29826E-01

DISPLACEMENTS AT NODES

NODE	X-TRAN	Y-TRAN	Z-TRAN	X-ROT	Y-ROT	Z-ROT
1	.12558E-01	-.60570E-01	.32854E-02	.28223E-03	-.87284E-04	-.44920E-02
2	.12017E-01	-.14300E+00	.20117E-02	.00000E+00	.00000E+00	.00000E+00
3	.14917E-01	-.17735E+00	-.93440E-03	.00000E+00	.00000E+00	.00000E+00
4	.24570E-02	-.19842E+00	-.24555E-02	.00000E+00	.00000E+00	.00000E+00
5	-.63045E-02	-.15121E+00	.91214E-03	.10988E-03	-.41017E-02	.18436E-02
6	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
7	.46937E-02	-.60569E-01	.27915E-02	.28223E-03	-.87284E-04	-.44976E-02
8	.33303E-02	-.13711E+00	.23979E-02	.00000E+00	.00000E+00	.00000E+00
9	.74707E-02	-.17468E+00	-.10385E-02	.00000E+00	.00000E+00	.00000E+00
10	.53902E-02	-.19609E+00	-.25625E-02	.00000E+00	.00000E+00	.00000E+00

11	-.30843E-02	-.15116E+00	.71936E-03	.11072E-03	-.41017E-02	.18334E-02
12	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
13	-.31994E-02	-.60567E-01	.22975E-02	.28223E-03	-.87284E-04	-.45303E-02
14	-.45751E-02	-.12936E+00	.37199E-02	.36259E-01	-.13912E-02	-.40197E-01
15	.22682E-02	-.17081E+00	-.14052E-02	-.81774E-02	.11780E-02	.59912E-02
16	.47472E-02	-.19119E+00	-.29924E-02	.96157E-03	.53182E-03	-.10859E-02
17	.11223E-03	-.15109E+00	.52314E-03	.11410E-03	-.41017E-02	.18234E-02
18	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
19	-.12685E-01	-.60565E-01	.17149E-02	.28000E-03	-.87286E-04	-.46540E-02
20	-.15632E-01	-.11829E+00	.19397E-02	.00000E+00	.00000E+00	.00000E+00
21	-.24697E-02	-.16274E+00	-.62279E-03	.00000E+00	.00000E+00	.00000E+00
22	.50367E-02	-.18027E+00	-.18823E-02	.00000E+00	.00000E+00	.00000E+00
23	.38724E-02	-.15100E+00	.28201E-03	.11826E-03	-.41017E-02	.18027E-02
24	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
25	-.19103E-01	-.26439E-01	.44499E-03	.00000E+00	.00000E+00	.00000E+00
26	-.20494E-01	-.30473E-01	.53175E-03	.00000E+00	.00000E+00	.00000E+00
27	-.22564E-01	-.35852E-01	.70603E-03	.27145E-03	-.86939E-04	-.49419E-02
28	-.22565E-01	-.42030E-01	.81467E-03	.27145E-03	-.86878E-04	-.49423E-02
29	-.22567E-01	-.48212E-01	.92338E-03	.27200E-03	-.87061E-04	-.49467E-02
30	-.22570E-01	-.54292E-01	.10323E-02	.27255E-03	-.87255E-04	-.49398E-02
31	-.22572E-01	-.60562E-01	.11414E-02	.27330E-03	-.87291E-04	-.49306E-02
32	-.19199E-01	-.97073E-01	.97091E-03	.00000E+00	.00000E+00	.00000E+00
33	-.84607E-02	-.15252E+00	-.31333E-03	.00000E+00	.00000E+00	.00000E+00
34	.24471E-02	-.16609E+00	-.10432E-02	.00000E+00	.00000E+00	.00000E+00
35	.75628E-02	-.15088E+00	.35402E-04	.11972E-03	-.41017E-02	.17642E-02
36	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
37	-.17815E-01	-.12259E-01	.15611E-03	.00000E+00	.00000E+00	.00000E+00
38	-.21671E-01	-.19380E-01	.19959E-03	.00000E+00	.00000E+00	.00000E+00
39	-.26960E-01	-.28047E-01	.18807E-03	.00000E+00	.00000E+00	.00000E+00
40	-.33776E-01	-.38551E-01	.95269E-04	-.23152E-04	-.37675E-04	.78721E-03
41	-.36759E-01	-.46890E-01	.12449E-03	.00000E+00	.00000E+00	.00000E+00
42	-.39264E-01	-.56099E-01	.69586E-04	.34547E-04	-.12683E-03	.27028E-03
43	-.38828E-01	-.72164E-01	-.48218E-05	.00000E+00	.00000E+00	.00000E+00
44	-.37481E-01	-.80111E-01	-.40530E-04	.00000E+00	.00000E+00	.00000E+00
45	-.26119E-01	-.10795E+00	-.13160E-03	.00000E+00	.00000E+00	.00000E+00
46	-.12279E-01	-.11335E+00	-.15937E-03	.00000E+00	.00000E+00	.00000E+00
47	.99515E-02	-.15081E+00	-.12760E-03	.11992E-03	-.41017E-02	.17526E-02
48	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
49	-.10061E-01	-.36210E-02	.58144E-04	.00000E+00	.00000E+00	.00000E+00
50	-.14182E-01	-.12334E-01	.80663E-04	.00000E+00	.00000E+00	.00000E+00
51	-.20397E-01	-.24792E-01	.78012E-04	.00000E+00	.00000E+00	.00000E+00
52	-.25332E-01	-.38355E-01	.65736E-04	.23365E-05	-.41923E-04	.79347E-03
53	-.29619E-01	-.46260E-01	.29021E-04	.00000E+00	.00000E+00	.00000E+00
54	-.32281E-01	-.52993E-01	.12490E-05	.23374E-04	-.12868E-03	.10539E-02
55	-.31478E-01	-.59799E-01	-.56436E-05	.00000E+00	.00000E+00	.00000E+00
56	-.30023E-01	-.65073E-01	-.19696E-04	.00000E+00	.00000E+00	.00000E+00
57	-.23763E-01	-.74280E-01	-.44118E-04	.00000E+00	.00000E+00	.00000E+00
58	-.13637E-01	-.72681E-01	-.49107E-04	.00000E+00	.00000E+00	.00000E+00
59	-.29577E-02	-.64939E-01	-.52262E-04	.00000E+00	.00000E+00	.00000E+00
60	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
61	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
62	-.62802E-02	-.66714E-02	.31289E-04	.00000E+00	.00000E+00	.00000E+00
63	-.12640E-01	-.20363E-01	.40041E-04	.00000E+00	.00000E+00	.00000E+00
64	-.18786E-01	-.37848E-01	.22975E-04	-.52293E-05	-.40669E-04	.44001E-03
65	-.20385E-01	-.42278E-01	.16154E-04	.00000E+00	.00000E+00	.00000E+00
66	-.20440E-01	-.48460E-01	.20757E-05	.20902E-04	-.12908E-03	.14615E-02
67	-.20266E-01	-.50070E-01	-.48783E-05	.00000E+00	.00000E+00	.00000E+00
68	-.18517E-01	-.49445E-01	-.90586E-05	.00000E+00	.00000E+00	.00000E+00
69	-.12659E-01	-.47415E-01	-.14458E-04	.00000E+00	.00000E+00	.00000E+00
70	-.55204E-02	-.40166E-01	-.15465E-04	.00000E+00	.00000E+00	.00000E+00
71	-.68234E-03	-.26010E-01	-.93144E-05	.00000E+00	.00000E+00	.00000E+00
72	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
73	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
74	-.72448E-02	-.67746E-02	.67669E-05	.00000E+00	.00000E+00	.00000E+00
75	-.12676E-01	-.15119E-01	.10673E-04	.00000E+00	.00000E+00	.00000E+00
76	-.15787E-01	-.36944E-01	.11460E-04	-.57903E-05	-.40579E-04	.20142E-03
77	-.11515E-01	-.28631E-01	.72584E-05	.00000E+00	.00000E+00	.00000E+00
78	-.47850E-02	-.43381E-01	.17046E-05	.21843E-04	-.12892E-03	.17108E-02
79	-.33088E-02	-.33401E-01	-.12186E-05	.00000E+00	.00000E+00	.00000E+00
80	-.15107E-02	-.29333E-01	-.30781E-05	.00000E+00	.00000E+00	.00000E+00
81	.81082E-03	-.24798E-01	-.41426E-05	.00000E+00	.00000E+00	.00000E+00
82	.25306E-02	-.18905E-01	-.36886E-05	.00000E+00	.00000E+00	.00000E+00
83	.27223E-02	-.11060E-01	-.23733E-05	.00000E+00	.00000E+00	.00000E+00
84	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
85	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
86	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
87	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
88	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
89	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
90	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
91	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
92	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
93	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
94	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
95	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
96	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00

HORIZONTAL WALL MOVEMENT
AT THE TOP = .01256 FT.
AT THE TIE-ROD = -.00320 FT.
AT THE BASE = -.02257 FT.

ELEMENT STRAINS AND STRESSES

EL.NO.	LOC	DEXX	DEYY	DGXY	DGXZ	DGYZ	SXX	SYY	SZZ	TXY	TXZ	TYZ
1	CEN	-.462E-03	-.141E-03	-.583E-03	.432E-06	.141E-06	-.428E+04	-.605E+04	-.378E+04	-.912E+02	.422E-01	.138E-01
	I-J	.000E+00	-.152E-03	-.162E-03	.000E+00	.152E-06	-.408E+04	-.594E+04	-.367E+04	-.161E+02	.000E+00	.148E-01
	J-K	-.472E-03	-.289E-03	-.750E-03	.441E-06	.288E-06	-.435E+04	-.617E+04	-.385E+04	-.108E+03	.431E-01	.282E-01
	K-L	-.864E-03	-.132E-03	-.949E-03	.807E-06	.132E-06	-.445E+04	-.614E+04	-.387E+04	-.156E+03	.788E-01	.129E-01
	L-I	-.452E-03	.000E+00	-.423E-03	.422E-06	.000E+00	-.421E+04	-.593E+04	-.371E+04	-.746E+02	.413E-01	.000E+00
2	CEN	-.367E-03	-.472E-03	-.991E-03	.269E-06	.389E-06	-.423E+04	-.625E+04	-.385E+04	-.197E+03	.260E-01	.376E-01
	I-J	.000E+00	-.514E-03	-.468E-03	.000E+00	.410E-06	-.421E+04	-.627E+04	-.385E+04	-.389E+02	.000E+00	.396E-01
	J-K	-.376E-03	-.669E-03	-.113E-02	.275E-06	.485E-06	-.438E+04	-.651E+04	-.400E+04	-.205E+03	.266E-01	.468E-01
	K-L	-.685E-03	-.435E-03	-.144E-02	.501E-06	.371E-06	-.425E+04	-.622E+04	-.384E+04	-.333E+03	.484E-01	.358E-01
	L-I	-.359E-03	-.284E-03	-.853E-03	.263E-06	.297E-06	-.408E+04	-.599E+04	-.370E+04	-.188E+03	.254E-01	.267E-01

3	CEN	-.238E-03	-.109E-02	-.210E-02	.838E-07	.535E-06	-.425E+04	-.668E+04	-.404E+04	-.319E+03	.798E-02	.509E-01
	I-J	.000E+00	-.129E-02	-.703E-03	.000E+00	.547E-06	-.433E+04	-.684E+04	-.413E+04	-.536E+02	.000E+00	.520E-01
	J-K	-.243E-03	-.163E-02	-.223E-02	.858E-07	.567E-06	-.452E+04	-.715E+04	-.431E+04	-.327E+03	.817E-02	.539E-01
	K-L	-.442E-03	-.925E-03	-.331E-02	.156E-06	.526E-06	-.418E+04	-.655E+04	-.396E+04	-.546E+03	.148E-01	.500E-01
	L-I	-.232E-03	-.580E-03	-.199E-02	.819E-07	.505E-06	-.399E+04	-.624E+04	-.378E+04	-.311E+03	.779E-02	.481E-01
4	CEN	.226E-03	-.170E-02	-.272E-03	-.222E-06	.493E-06	-.414E+04	-.710E+04	-.418E+04	-.104E+03	-.206E-01	.458E-01
	I-J	.000E+00	-.166E-02	-.692E-03	.000E+00	.474E-06	-.428E+04	-.720E+04	-.427E+04	-.565E+02	.000E+00	.441E-01
	J-K	.226E-03	-.145E-02	-.145E-03	-.222E-06	.368E-06	-.422E+04	-.723E+04	-.426E+04	-.881E+02	-.206E-01	.342E-01
	K-L	.546E-03	-.175E-02	.325E-03	-.537E-06	.519E-06	-.394E+04	-.697E+04	-.406E+04	-.171E+03	-.499E-01	.483E-01
	L-I	.226E-03	-.195E-02	-.399E-03	-.222E-06	.618E-06	-.406E+04	-.697E+04	-.410E+04	-.119E+03	-.206E-01	.574E-01
5	CEN	.355E-03	-.189E-02	-.116E-02	-.293E-06	.203E-06	-.410E+04	-.728E+04	-.427E+04	-.139E+03	-.263E-01	.182E-01
	I-J	.000E+00	-.183E-02	-.413E-03	.000E+00	.227E-06	-.422E+04	-.732E+04	-.433E+04	-.263E+02	.000E+00	.204E-01
	J-K	.355E-03	-.233E-02	-.962E-03	-.293E-06	.375E-07	-.429E+04	-.759E+04	-.446E+04	-.121E+03	-.263E-01	.337E-02
	K-L	.860E-03	-.198E-02	-.223E-02	-.710E-06	.168E-06	-.392E+04	-.722E+04	-.418E+04	-.300E+03	-.637E-01	.151E-01
	L-I	.355E-03	-.145E-02	-.136E-02	-.293E-06	.368E-06	-.391E+04	-.696E+04	-.408E+04	-.157E+03	-.263E-01	.330E-01
6	CEN	.169E-03	-.176E-02	.968E-03	-.335E-06	-.431E-07	-.413E+04	-.732E+04	-.432E+04	.649E+02	-.299E-01	-.385E-02
	I-J	.000E+00	-.195E-02	-.205E-03	.000E+00	.123E-07	-.422E+04	-.741E+04	-.438E+04	-.367E+01	.000E+00	.110E-02
	J-K	.169E-03	-.151E-02	.100E-02	-.335E-06	-.117E-06	-.409E+04	-.725E+04	-.428E+04	.677E+02	-.299E-01	-.104E-01
	K-L	.337E-03	-.157E-02	.213E-02	-.667E-06	-.979E-07	-.404E+04	-.724E+04	-.426E+04	.133E+03	-.595E-01	-.874E-02
	L-I	.169E-03	-.201E-02	.930E-03	-.335E-06	.305E-07	-.417E+04	-.739E+04	-.436E+04	.621E+02	-.299E-01	.272E-02
7	CEN	.228E-03	-.149E-02	.437E-03	-.236E-06	-.152E-06	-.403E+04	-.721E+04	-.425E+04	.234E+02	-.209E-01	-.135E-01
	I-J	.000E+00	-.159E-02	-.122E-03	.000E+00	-.109E-06	-.412E+04	-.728E+04	-.431E+04	.452E+01	.000E+00	-.963E-02
	J-K	.228E-03	-.138E-02	.487E-03	-.236E-06	-.204E-06	-.402E+04	-.720E+04	-.424E+04	.272E+02	-.209E-01	-.181E-01
	K-L	.508E-03	-.138E-02	.112E-02	-.525E-06	-.206E-06	-.392E+04	-.714E+04	-.418E+04	.465E+02	-.465E-01	-.182E-01
	L-I	.228E-03	-.161E-02	.387E-03	-.236E-06	-.101E-06	-.404E+04	-.723E+04	-.426E+04	.196E+02	-.209E-01	-.889E-02
8	CEN	.252E-03	-.128E-02	.522E-03	-.115E-06	-.205E-06	-.397E+04	-.714E+04	-.421E+04	.359E+02	-.102E-01	-.180E-01
	I-J	.000E+00	-.137E-02	-.177E-04	.000E+00	-.183E-06	-.405E+04	-.720E+04	-.426E+04	.139E+02	.000E+00	-.161E-01
	J-K	.252E-03	-.117E-02	.577E-03	-.115E-06	-.230E-06	-.396E+04	-.712E+04	-.420E+04	.391E+02	-.102E-01	-.203E-01
	K-L	.475E-03	-.120E-02	.100E-02	-.218E-06	-.225E-06	-.390E+04	-.709E+04	-.416E+04	.554E+02	-.192E-01	-.198E-01
	L-I	.252E-03	-.139E-02	.467E-03	-.115E-06	-.180E-06	-.398E+04	-.716E+04	-.422E+04	.326E+02	-.102E-01	-.158E-01
9	CEN	.181E-03	-.101E-02	.733E-03	.478E-07	-.191E-06	-.393E+04	-.707E+04	-.417E+04	.527E+02	.420E-02	-.168E-01
	I-J	.000E+00	-.111E-02	.847E-04	.000E+00	-.198E-06	-.397E+04	-.710E+04	-.420E+04	.204E+02	.000E+00	-.174E-01
	J-K	.181E-03	-.875E-03	.772E-03	.478E-07	-.181E-06	-.391E+04	-.704E+04	-.415E+04	.539E+02	.420E-02	-.159E-01
	K-L	.332E-03	-.931E-03	.128E-02	.878E-07	-.185E-06	-.390E+04	-.704E+04	-.415E+04	.798E+02	.771E-02	-.162E-01
	L-I	.181E-03	-.115E-02	.693E-03	.478E-07	-.202E-06	-.395E+04	-.710E+04	-.419E+04	.516E+02	.420E-02	-.177E-01
10	CEN	.202E-04	-.667E-03	.961E-03	.138E-06	-.138E-06	-.390E+04	-.697E+04	-.413E+04	.799E+02	.122E-01	-.122E-01
	I-J	.000E+00	-.759E-03	.133E-03	.000E+00	-.154E-06	-.388E+04	-.698E+04	-.412E+04	.205E+02	.000E+00	-.135E-01
	J-K	.202E-04	-.485E-03	.965E-03	.138E-06	-.108E-06	-.387E+04	-.690E+04	-.409E+04	.782E+02	.122E-01	-.948E-02
	K-L	.371E-04	-.589E-03	.165E-02	.254E-06	-.125E-06	-.392E+04	-.696E+04	-.413E+04	.130E+03	.224E-01	-.110E-01
	L-I	.202E-04	-.848E-03	.956E-03	.138E-06	-.168E-06	-.394E+04	-.703E+04	-.416E+04	.815E+02	.122E-01	-.148E-01
11	CEN	-.260E-03	-.232E-03	.111E-02	.227E-06	-.498E-07	-.392E+04	-.686E+04	-.409E+04	.996E+02	.202E-01	-.443E-02
	I-J	.000E+00	-.280E-03	.690E-04	.000E+00	-.602E-07	-.375E+04	-.677E+04	-.400E+04	.964E+01	.000E+00	-.535E-02
	J-K	-.260E-03	.000E+00	.106E-02	.227E-06	.000E+00	-.386E+04	-.677E+04	-.404E+04	.916E+02	.202E-01	.000E+00
	K-L	-.444E-03	-.198E-03	.185E-02	.387E-06	-.425E-07	-.404E+04	-.692E+04	-.416E+04	.163E+03	.344E-01	-.378E-02
	L-I	-.260E-03	-.464E-03	.117E-02	.227E-06	-.996E-07	-.398E+04	-.696E+04	-.415E+04	.108E+03	.202E-01	-.886E-02
12	CEN	-.754E-03	.125E-04	-.723E-03	.236E-05	.562E-06	-.209E+04	-.271E+04	-.171E+04	-.222E+03	.200E+00	.477E-01
	I-J	-.842E-03	.130E-04	-.756E-03	.861E-06	.582E-06	-.238E+04	-.287E+04	-.187E+04	-.376E+02	.732E-01	.494E-01
	J-K	-.739E-03	.278E-04	-.677E-03	.261E-05	.125E-05	-.225E+04	-.305E+04	-.189E+04	-.223E+03	.221E+00	.106E+00
	K-L	-.671E-03	.121E-04	-.693E-03	.376E-05	.543E-06	-.182E+04	-.255E+04	-.155E+04	-.393E+03	.319E+00	.461E-01
	L-I	-.766E-03	.000E+00	-.761E-03	.215E-05	.000E+00	-.196E+04	-.242E+04	-.156E+04	-.220E+03	.183E+00	.000E+00
13	CEN	-.645E-03	-.928E-04	-.122E-02	.129E-05	.158E-05	-.240E+04	-.346E+04	-.211E+04	-.341E+03	.112E+00	.137E+00
	I-J	-.627E-03	-.108E-03	-.926E-03	.652E-06	.161E-05	-.256E+04	-.358E+04	-.220E+04	-.155E+03	.565E-01	.140E+00
	J-K	-.648E-03	-.266E-03	-.129E-02	.143E-05	.196E-05	-.265E+04	-.395E+04	-.237E+04	-.364E+03	.124E+00	.170E+00
	K-L	-.661E-03	-.792E-04	-.149E-02	.188E-05	.155E-05	-.227E+04	-.336E+04	-.202E+04	-.513E+03	.163E+00	.135E+00
	L-I	-.642E-03	.420E-04	-.116E-02	.118E-05	.129E-05	-.221E+04	-.309E+04	-.190E+04	-.323E+03	.103E+00	.112E+00
14	CEN	-.546E-03	-.203E-05	-.229E-02	-.293E-06	.173E-05	-.261E+04	-.410E+04	-.243E+04	-.404E+03	-.257E-01	.152E+00
	I-J	-.373E-03	.344E-04	-.263E-02	.294E-06	.167E-05	-.264E+04	-.414E+04	-.246E+04	-.337E+03	.258E-01	.146E+00
	J-K	-.598E-03	.263E-03	-.233E-02	-.470E-06	.125E-05	-.276E+04	-.436E+04	-.258E+04	-.423E+03	-.412E-01	.109E+00
	K-L	-.700E-03	-.346E-04	-.198E-02	-.818E-06	.179E-05	-.259E+04	-.407E+04	-.241E+04	-.464E+03	-.717E-01	.157E+00
	L-I	-.509E-03	-.192E-03	-.225E-02	-.167E-06	.208E-05	-.251E+04	-.391E+04	-.233E+04	-.390E+03	-.146E-01	.182E+00
15	CEN	.191E-03	-.761E-03	-.340E-03	-.787E-06	.110E-05	-.263E+04	-.469E+04	-.268E+04	-.167E+03	-.681E-01	.952E-01
	I-J	.546E-03	-.826E-03	.415E-03	-.537E-06	.108E-05	-.249E+04	-.463E+04	-.260E+04	-.793E+02	-.465E-01	.934E-01
	J-K	.191E-03	-.138E-02	-.622E-03	-.787E-06	.902E-06	-.282E+04	-.503E+04	-.287E+04	-.195E+03	-.681E-01	.780E-01
	K-L	-.259E-03	-.678E-03	-.130E-02	-.110E-05	.113E-05	-.281E+04	-.476E+04	-.277E+04	-.278E+03	-.955E-01	.975E-01
	L-I	.191E-03	-.138E-03	-.586E-04	-.787E-06	.130E-05	-.244E+04	-.436E+04	-.248E+04	-.139E+03	-.681E-01	.112E+00
16	CEN	.476E-03	-.107E-02	-.270E-02	-.140E-05	.353E-06	-.254E+04	-.482E+04	-.271E+04	-.296E+03	-.116E+00	.292E-01
	I-J	.860E-03	-.111E-02	-.306E-02	-.710E-06	.411E-06	-.234E+04	-.470E+04	-.259E+04	-.287E+03	-.587E-01	.340E-01
	J-K	.476E-03	-.764E-03	-.300E-02	-.140E-05	-.196E-06	-.255E+04	-.484E+04	-.272E+04	-.330E+03	-.116E+00	-.162E-01
	K-L	-.894E-05	-.103E-02	-.224E-02	-.228E-05	.280E-06	-.279E+04	-.497E+04	-.286E+04	-.307E+03	-.188E+00	.232E-01
	L-I	.476E-03	-.138E-02	-.239E-02	-.140E-05	.902E-06	-.253E+04	-.480E+04	-.269E+04	-.263E+03	-.116E+00	.746E-01
17	CEN	.230E-03	-.814E-03	-.430E-03	-.138E-05	-.507E-06	-.257E+04	-.486E+04	-.275E+04	-.706E+02	-.114E+00	-.420E-01
	I-J	.337E-03	-.539E-03	.706E-03	-.667E-06	-.332E-06	-.240E+04	-.466E+04	-.261E+04	.551E+02	-.552E-01	-.275E-01
	J-K	.230E-03	-.131E-02	-.477E-03	-.138E-05	-.823E-06	-.272E+04	-.511E+04	-.290E+04	-.784E+02	-.114E+00	-.681E-01
	K-L	.624E-04	-.125E-02	-.221E-02	-.249E-05	-.783E-06	-.284E+04	-.516E+04	-.296E+04	-.268E+03	-.206E+00	-.648E-01
	L-I	.230E-03	-.321E-03	-.382E-03	-.138E-05	-.192E-06	-.242E+04	-.460E+04	-.259E+04	-.627E+02	-.114E+00	-.159E-01
18	CEN	.564E-03	-.159E-02	-.767E-03	-.961E-06	-.843E-06	-.263E+04	-.512E+04	-.287E+04	-.867E+02	-.783E-01	-.686E-01
	I-J	.508E-03	-.144E-02	-.385E-03	-.525E-06	-.682E-06	-.255E+04	-.502E+04	-.280E+04	-.343E+02	-.428E-01	-.556E-01
	J-K	.564E-03	-.173E-02	-.746E-03	-.961E-06	-.999E-06	-.268E+04	-.521E+04	-.292E+04	-.885E+02	-.783E-01	-.814E-01
	K-L	.637E-03	-.178E-02	-.126E-02	-.152E-05	-.105E-05	-.273E+04	-.526E+04	-.296E+04	-.154E+03	-.124E+00	-.855E-01
	L-I	.564E-03	-.144E-02	-.787E-03	-.961E-06	-.686E-06	-.258E+04	-.504E+04	-.282E+04	-.848E+02	-.783E-01	-.559E-01
19	CEN	.792E-03	-.192E-02	-.607E-03	-.626E-06	-.106E-05	-.261E+04	-.521E+04	-.290E+04	-.584E+02	-.504E-01	-.856E-01
	I-J	.475E-03	-.181E-02	-.436E-03	-.218E-06	-.909E-06	-.265E+04	-.519E+04	-.291E+04	-.227E+02	-.175E-01	-.731E-01
	J-K	.792E-03	-.207E-02	-.450E-03	-.626E-06	-.127E-05	-.267E+04	-.532E+04	-.296E+04	-.495E+02	-.504E-01	-.102E+00
	K-L	.108E-02	-.202E-02	-.761E-03	-.993E-06	-.120E-05	-.257E+04	-.524E+04	-.290E+04	-.904E+02	-.799E-01	-.969E-01
	L-I	.792E-03	-.178E-02	-.764E-03	-.626E-06	-.862E-06	-.255E+04	-.511E+04	-.284E+04	-.672E+02	-.504E-01	-.694E-01
20	CEN	.792E-03	-.186E-02	.330E-03	-.495E-07	-.114E-05	-.260E+04	-.520E+04	-.289E+04	.272E+02	-.397E-02	-.910E-01
	I-J	.332E-03	-.187E-02	.151E-03	.878E-07	-.109E-05	-.273E+04	-.528E+04	-.298E+04	.206E+02	.704E-02	-.876E-01
	J-K	.792E-03	-.184E-02	.571E-03	-.495E-07	-.121E-05	-.260E+04	-.521E+04	-.290E+04	.422E+02	-.397E-02	-.968E-01
	K-L	.119E-02	-.185E-02	.483E-03	-.168E-06	-.117E-05	-.248E+04	-.513E+04	-.283E+04	.329E+02	-.134E-01	-.940E-01
	L-I	.792E-03	-.188E-02	.887E-04	-.495E-07	-.106E-05	-.259E+04	-.520E+04	-.289E+04	.123E+02	-.397E-02	-.853E-01
21	CEN	.450E-03	-.139E-02	.149E-02	.667E-06	-.798E-06	-.268E+04	-.518E+04	-.291E+04	.116E+03	.545E-01	-.653E-01
	I-J	.371E-04	-.149E-02	.944E-03	.254E-06	-.892E-06	-.276E+04	-.524E+04	-.296E+04	.904E+02	.208E-01	-.729E-01
	J-K	.450E-03	-.116E-02	.170E-02	.667E-06	-.582E-06	-.264E+04	-.512E+04	-.288E+04	.123E+03	.545E-01	-.475E-01
	K-L	.805E-03	-.131E-02	.195E-02	.102E-05	-.718E-06	-.261E+04	-.512E+04	-.287E+04	.138E+03	.836E-01	-.587E-01
	L-I	.450E-03	-.163E-02	.127E-02	.667E-06	-.102E-05	-.271E+04	-.523E+04	-.295E+04	.109E+03	.545E-01	-.830E-01
22	CEN	-.145E-03	-.517E-03	.245E-02	.831E-06	-.276E-06	-.270E+04	-.496E+04	-.284E+04	.212E+03	.692E-01	-.230E-01
	I-J	-.444E-03	-.593E-03	.159E-02	.387E-06	-.317E-06	-.275E+04	-.501E+04	-.288E+04	.141E+03	.322E-01	-.264E-01
	J-K	-.145E-03	.000E+00	.263E-02	.831E-06	.000E+00	-.257E+04	-.475E+04	-.272E+04	.217E+03	.692E-01	.000E+00
	K-L	.860E-04	-.459E-03	.311E-02	.117E-05	-.245E-06	-.265E+04	-.492E+04	-.281E+04	.267E+03	.978E-01	-.204E-01
	L-I	-.145E-03	-.103E-02	.226E-02	.831E-06	-.552E-06	-.282E+04	-.517E+04	-.296E+04	.207E+03	.692E-01	-.460E-01
23	CEN	-.883E-03	.301E-03	-.120E-02	.499E-05	.278E-05	-.820E+03	-.792E+03	-.587E+03	-.265E+03	.308E+00	.172E+00
	I-J	-.903E-03	.106E-03	-.103E-02	.503E-05	.271E-05	-.104E+04	-.121E+04	-.820E+03	-.210E+03	.311E+00	.168E+00
	J-K	-.863E-03	.729E-04	-.129E-02	.495E-05	.270E-05	-.114E+04	-.132E+04	-.896E+03	-.338E+03	.306E+00	.167E+00
	K-L	-.853E-03	.579E-03	-.143E-02	.493E-05	.287E-05	-.506E+03	-.193E+03	-.254E+03	-.345E+03	.304E+00	.177E+00
	L-I	-.903E-03	.538E-03	-.110E-02	.503E-05	.285E-05	-.485E+03	-.243E+03	-.265E+03	-.189E+03	.311E+00	.176E+00

45	CEN	-.597E-03	.205E-03	-.875E-03	.264E-04	.189E-04	-.373E+03	-.208E+03	-.218E+03	-.169E+03	.123E+01	.875E+00
	I-J	-.568E-03	.857E-04	-.837E-03	.215E-04	.261E-04	-.355E+03	-.231E+03	-.221E+03	-.176E+03	.996E+00	.121E+01
	J-K	-.604E-03	.138E-03	-.919E-03	.276E-04	.230E-04	-.403E+03	-.246E+03	-.244E+03	-.179E+03	.128E+01	.107E+01
	K-L	-.696E-03	.610E-03	-.101E-02	.434E-04	-.596E-05	-.433E+03	-.126E+03	-.210E+03	-.144E+03	.201E+01	-.277E+00
	L-I	-.589E-03	.283E-03	-.825E-03	.251E-04	.141E-04	-.337E+03	-.163E+03	-.188E+03	-.157E+03	.116E+01	.653E+00
46	CEN	-.875E-03	.391E-03	-.107E-02	.352E-04	.312E-04	-.472E+03	-.479E+03	-.358E+03	-.197E+03	.173E+01	.154E+01
	I-J	-.818E-03	.240E-03	-.924E-03	.168E-04	.459E-04	-.401E+03	-.501E+03	-.339E+03	-.192E+03	.825E+00	.226E+01
	J-K	-.884E-03	.277E-03	-.114E-02	.384E-04	.423E-04	-.542E+03	-.570E+03	-.418E+03	-.218E+03	.189E+01	.208E+01
	K-L	-.104E-02	.818E-03	-.148E-02	.871E-04	-.994E-05	-.672E+03	-.415E+03	-.409E+03	-.211E+03	.428E+01	-.489E+00
	L-I	-.863E-03	.522E-03	-.994E-03	.316E-04	.186E-04	-.393E+03	-.374E+03	-.288E+03	-.174E+03	.155E+01	.917E+00
47	CEN	-.866E-03	.391E-03	-.176E-02	.229E-04	.610E-04	-.519E+03	-.734E+03	-.467E+03	-.221E+03	.124E+01	.331E+01
	I-J	-.109E-02	.209E-03	-.116E-02	.633E-05	.668E-04	-.544E+03	-.794E+03	-.499E+03	-.180E+03	.343E+00	.362E+01
	J-K	-.832E-03	.149E-03	-.174E-02	.254E-04	.687E-04	-.578E+03	-.830E+03	-.525E+03	-.229E+03	.138E+01	.373E+01
	K-L	-.392E-06	.109E-02	-.407E-02	.869E-04	.387E-04	-.423E+03	-.500E+03	-.346E+03	-.378E+03	.472E+01	.210E+01
	L-I	-.903E-03	.653E-03	-.179E-02	.202E-04	.527E-04	-.455E+03	-.629E+03	-.404E+03	-.212E+03	.109E+01	.286E+01
48	CEN	-.720E-03	.487E-04	-.216E-02	.333E-04	.742E-04	-.576E+03	-.896E+03	-.544E+03	-.199E+03	.194E+01	.433E+01
	I-J	-.103E-02	-.324E-05	-.151E-02	.101E-04	.761E-04	-.619E+03	-.926E+03	-.571E+03	-.177E+03	.590E+00	.445E+01
	J-K	-.720E-03	-.134E-03	-.207E-02	.333E-04	.810E-04	-.594E+03	-.926E+03	-.561E+03	-.197E+03	.194E+01	.473E+01
	K-L	-.195E-05	.169E-03	-.366E-02	.870E-04	.697E-04	-.477E+03	-.826E+03	-.483E+03	-.251E+03	.508E+01	.407E+01
	L-I	-.720E-03	.231E-03	-.225E-02	.333E-04	.674E-04	-.559E+03	-.866E+03	-.527E+03	-.202E+03	.194E+01	.394E+01
49	CEN	-.605E-03	-.290E-03	-.220E-02	.130E-04	.904E-04	-.622E+03	-.964E+03	-.581E+03	-.164E+03	.801E+00	.555E+01
	I-J	-.866E-03	-.246E-03	-.169E-02	-.190E-04	.877E-04	-.641E+03	-.972E+03	-.591E+03	-.156E+03	-.116E+01	.538E+01
	J-K	-.605E-03	-.446E-03	-.212E-02	.130E-04	.998E-04	-.628E+03	-.975E+03	-.587E+03	-.163E+03	.801E+00	.612E+01
	K-L	-.188E-05	-.392E-03	-.338E-02	.872E-04	.966E-04	-.578E+03	-.945E+03	-.559E+03	-.182E+03	.535E+01	.593E+01
	L-I	-.605E-03	-.134E-03	-.227E-02	.130E-04	.810E-04	-.617E+03	-.953E+03	-.576E+03	-.165E+03	.801E+00	.497E+01
50	CEN	.144E-03	-.747E-03	-.568E-02	.115E-04	.109E-03	-.499E+03	-.926E+03	-.522E+03	-.322E+03	.649E+00	.616E+01
	I-J	.248E-03	-.108E-02	-.739E-02	-.422E-04	.988E-04	-.468E+03	-.986E+03	-.533E+03	-.446E+03	-.238E+01	.557E+01
	J-K	.144E-03	-.438E-03	-.570E-02	.115E-04	.119E-03	-.435E+03	-.816E+03	-.458E+03	-.326E+03	.649E+00	.670E+01
	K-L	-.220E-05	-.277E-03	-.327E-02	.873E-04	.124E-03	-.542E+03	-.840E+03	-.506E+03	-.148E+03	.492E+01	.698E+01
	L-I	.144E-03	-.106E-02	-.566E-02	.115E-04	.995E-04	-.563E+03	-.104E+04	-.586E+03	-.319E+03	.649E+00	.561E+01
51	CEN	.166E-02	-.412E-02	-.135E-01	-.727E-04	.915E-04	-.646E+03	-.154E+04	-.812E+03	-.708E+03	-.383E+01	.482E+01
	I-J	.800E-03	-.143E-02	-.277E-02	-.212E-04	.104E-03	-.390E+03	-.954E+03	-.494E+03	-.165E+03	-.112E+01	.549E+01
	J-K	.166E-02	-.599E-02	-.134E-01	-.727E-04	.827E-04	-.938E+03	-.202E+04	-.110E+04	-.703E+03	-.383E+01	.436E+01
	K-L	.292E-02	-.804E-02	-.292E-01	-.148E-03	.731E-04	-.102E+04	-.240E+04	-.128E+04	-.150E+04	-.779E+01	.385E+01
	L-I	.166E-02	-.225E-02	-.137E-01	-.727E-04	.100E-03	-.355E+03	-.106E+04	-.520E+03	-.713E+03	-.383E+01	.529E+01
52	CEN	.174E-02	-.478E-02	-.429E-02	-.108E-03	.146E-04	-.731E+03	-.177E+04	-.918E+03	-.255E+03	-.658E+01	.887E+00
	I-J	.184E-02	-.426E-02	-.222E-02	-.148E-04	.383E-04	-.576E+03	-.159E+04	-.792E+03	-.132E+03	-.897E+00	.233E+01
	J-K	.174E-02	-.606E-02	-.435E-02	-.108E-03	-.439E-04	-.940E+03	-.213E+04	-.113E+04	-.265E+03	-.658E+01	-.267E+01
	K-L	.164E-02	-.527E-02	-.624E-02	-.196E-03	-.780E-05	-.878E+03	-.195E+04	-.104E+04	-.372E+03	-.119E+02	-.474E+00
	L-I	.174E-02	-.351E-02	-.423E-02	-.108E-03	.731E-04	-.522E+03	-.142E+04	-.709E+03	-.246E+03	-.658E+01	.444E+01
53	CEN	.167E-02	-.520E-02	.708E-03	-.511E-04	-.646E-04	-.810E+03	-.190E+04	-.989E+03	.536E+02	-.326E+01	-.413E+01
	I-J	.194E-02	-.509E-02	.129E-02	-.389E-05	-.548E-04	-.674E+03	-.181E+04	-.904E+03	.861E+02	-.249E+00	-.350E+01
	J-K	.167E-02	-.557E-02	.512E-03	-.511E-04	-.987E-04	-.863E+03	-.199E+04	-.104E+04	.349E+02	-.326E+01	-.631E+01
	K-L	.142E-02	-.530E-02	.172E-03	-.949E-04	-.736E-04	-.937E+03	-.199E+04	-.107E+04	.234E+02	-.606E+01	-.470E+01
	L-I	.167E-02	-.482E-02	.904E-03	-.511E-04	-.304E-04	-.757E+03	-.181E+04	-.936E+03	.723E+02	-.326E+01	-.194E+01
54	CEN	.120E-02	-.452E-02	.247E-02	.111E-03	-.469E-04	-.847E+03	-.171E+04	-.925E+03	.119E+03	.741E+01	-.314E+01
	I-J	.177E-02	-.465E-02	.173E-02	.795E-04	-.517E-04	-.689E+03	-.167E+04	-.854E+03	.227E+02	.532E+01	-.346E+01
	J-K	.310E-02	-.495E-04	-.336E-02	.669E-05	.120E-03	.127E+04	.122E+04	.900E+03	-.460E+03	.448E+00	.802E+01
	K-L	.665E-03	-.439E-02	.318E-02	.140E-03	-.422E-04	-.998E+03	-.175E+04	-.992E+03	.210E+03	.939E+01	-.283E+01
	L-I	.968E-03	-.507E-02	.320E-02	.124E-03	-.675E-04	-.111E+04	-.207E+04	-.115E+04	.191E+03	.828E+01	-.452E+01
55	CEN	-.837E-03	-.600E-05	.129E-01	.935E-05	.145E-04	-.535E+03	-.605E+03	-.425E+03	.593E+03	.406E+00	.631E+00
	I-J	-.102E-02	-.600E-05	.129E-01	.218E-04	.145E-04	-.560E+03	-.622E+03	-.442E+03	.622E+03	.946E+00	.631E+00
	J-K	-.759E-03	.000E+00	.131E-01	.399E-05	.000E+00	-.616E+03	-.757E+03	-.511E+03	.586E+03	.174E+00	.000E+00
	K-L	-.655E-03	-.600E-05	.129E-01	-.307E-05	.145E-04	-.510E+03	-.589E+03	-.409E+03	.565E+03	-.133E+00	.631E+00
	L-I	-.141E-02	-.495E-04	.113E-01	.482E-04	.120E-03	.575E+02	.495E+03	.194E+03	.646E+03	.209E+01	.521E+01
56	CEN	.184E-03	-.512E-02	-.376E-01	.235E-04	.373E-03	.578E+02	-.494E-04	-.494E-04	-.376E-03	.235E-06	.373E-05
	I-J	.292E-02	-.512E-02	-.284E-01	-.148E-03	.373E-03	.917E+03	-.220E-04	-.220E-04	-.284E-03	-.148E-05	.373E-05
	J-K	.184E-03	-.102E-01	-.391E-01	.235E-04	.468E-03	.578E+02	-.101E-03	-.101E-03	-.391E-03	.235E-06	.468E-05
	K-L	-.255E-02	-.512E-02	-.468E-01	.195E-03	.373E-03	-.801E+03	-.768E-04	-.768E-04	-.468E-03	.195E-05	.373E-05
	L-I	.184E-03	-.133E-05	-.361E-01	.235E-04	.277E-03	.578E+02	.183E-05	.183E-05	-.361E-03	.235E-06	.277E-05
57	CEN	.183E-02	-.759E-02	-.533E-02	-.294E-03	.159E-03	-.701E+03	-.169E+04	-.892E+03	-.279E+03	-.154E+02	.833E+01
	I-J	.164E-02	-.759E-02	-.617E-02	-.196E-03	.159E-03	-.749E+03	-.172E+04	-.921E+03	-.323E+03	-.103E+02	.833E+01
	J-K	.183E-02	-.493E-02	-.475E-02	-.294E-03	-.149E-03	-.290E+03	-.997E+03	-.481E+03	-.248E+03	-.154E+02	-.782E+01
	K-L	.201E-02	-.759E-02	-.449E-02	-.392E-03	.159E-03	-.653E+03	-.166E+04	-.863E+03	-.235E+03	-.205E+02	.833E+01
	L-I	.183E-02	-.102E-01	-.592E-02	-.294E-03	.468E-03	-.111E+04	-.238E+04	-.130E+04	-.310E+03	-.154E+02	.245E+02
58	CEN	.120E-02	-.589E-02	.516E-04	-.129E-03	-.277E-03	-.582E+03	-.131E+04	-.706E+03	.266E+01	-.668E+01	-.143E+02
	I-J	.142E-02	-.589E-02	.310E-03	-.949E-04	-.277E-03	-.526E+03	-.128E+04	-.673E+03	.160E+02	-.490E+01	-.143E+02
	J-K	.120E-02	-.685E-02	-.770E-03	-.129E-03	-.405E-03	-.726E+03	-.156E+04	-.850E+03	-.398E+02	-.668E+01	-.209E+02
	K-L	.976E-03	-.589E-02	-.207E-03	-.164E-03	-.277E-03	-.638E+03	-.135E+04	-.739E+03	-.107E+02	-.846E+01	-.143E+02
	L-I	.120E-02	-.493E-02	.873E-03	-.129E-03	-.149E-03	-.438E+03	-.107E+04	-.562E+03	.451E+02	-.668E+01	-.772E+01
59	CEN	.257E-03	-.345E-02	.263E-02	.211E-03	-.143E-03	-.432E+03	-.785E+03	-.457E+03	.125E+03	.100E+02	-.681E+01
	I-J	.665E-03	-.345E-02	.171E-02	.140E-03	-.143E-03	-.335E+03	-.727E+03	-.398E+03	.814E+02	.667E+01	-.681E+01
	J-K	.257E-03	-.546E-04	.111E-02	.211E-03	.119E-03	.533E+02	.237E+02	.289E+02	.527E+02	.100E+02	.567E+01
	K-L	-.151E-03	-.345E-02	.354E-02	.281E-03	-.143E-03	-.529E+03	-.844E+03	-.515E+03	.168E+03	.134E+02	-.681E+01
	L-I	.257E-03	-.685E-02	.414E-02	.211E-03	-.405E-03	-.918E+03	-.159E+04	-.942E+03	.197E+03	.100E+02	-.193E+02
60	CEN	-.496E-03	-.273E-04	.122E-01	-.138E-04	.596E-04	-.103E+03	-.648E+02	-.626E+02	.497E+03	-.560E+00	.243E+01
	I-J	-.655E-03	-.273E-04	.122E-01	-.307E-05	.596E-04	-.135E+03	-.840E+02	-.818E+02	.496E+03	-.125E+00	.243E+01
	J-K	-.496E-03	.000E+00	.131E-01	-.138E-04	.000E+00	-.997E+02	-.593E+02	-.593E+02	.533E+03	-.560E+00	.000E+00
	K-L	-.336E-03	-.273E-04	.122E-01	-.244E-04	.596E-04	-.708E+02	-.457E+02	-.435E+02	.497E+03	-.996E+00	.243E+01
	L-I	-.496E-03	-.546E-04	.113E-01	-.138E-04	.119E-03	-.106E+03	-.703E+02	-.659E+02	.460E+03	-.560E+00	.485E+01
61	CEN	-.187E-02	-.268E-02	-.499E-01	.714E-03	.571E-03	-.463E+03	-.455E-04	-.455E-04	-.499E-03	.714E-05	.571E-05
	I-J	-.255E-02	-.268E-02	-.451E-01	.195E-03	.571E-03	-.631E+03	-.523E-04	-.523E-04	-.451E-03	.195E-05	.571E-05
	J-K	-.187E-02	-.535E-02	-.495E-01	.714E-03	.860E-03	-.463E+03	-.722E-04	-.722E-04	-.495E-03	.714E-05	.860E-05
	K-L	-.119E-02	-.268E-02	-.547E-01	.123E-02	.571E-03	-.295E+03	-.387E-04	-.387E-04	-.547E-03	.123E-04	.571E-05
	L-I	-.187E-02	-.112E-05	-.502E-01	.714E-03	.281E-03	-.463E+03	-.187E-04	-.187E-04	-.502E-03	.714E-05	.281E-05
62	CEN	.153E-02	-.462E-02	-.275E-02	-.588E-03	.241E-03	-.557E+03	-.139E+04	-.764E+03	-.187E+03	-.399E+02	.164E+02
	I-J	.201E-02	-.462E-02	-.298E-02	-.392E-03	.241E-03	-.372E+03	-.127E+04	-.645E+03	-.202E+03	-.266E+02	.164E+02
	J-K	.153E-02	-.390E-02	-.428E-02	-.588E-03	-.378E-03	-.377E+03	-.111E+04	-.585E+03	-.290E+03	-.399E+02	-.257E+02
	K-L	.105E-02	-.462E-02	-.252E-02	-.784E-03	.241E-03	-.742E+03	-.151E+04	-.884E+03	-.171E+03	-.532E+02	.164E+02
	L-I	.153E-02	-.535E-02	-.123E-02	-.588E-03	.860E-03	-.736E+03	-.167E+04	-.944E+03	-.833E+02	-.399E+02	.584E+02
63	CEN	.649E-03	-.459E-02	-.139E-02	-.185E-03	-.457E-03	-.511E+03	-.103E+04	-.575E+03	-.691E+02	-.920E+01	-.227E+02
	I-J	.976E-03	-.459E-02	-.120E-02	-.164E-03	-.457E-03	-.431E+03	-.984E+03	-.528E+03	-.599E+02	-.814E+01	-.227E+02
	J-K	.649E-03	-.527E-02	-.260E-02	-.185E-03	-.536E-03	-.611E+03	-.120E+04	-.676E+03	-.130E+03	-.920E+01	-.267E+02
	K-L	.322E-03	-.459E-02	-.158E-02	-.206E-03	-.457E-03	-.591E+03	-.108E+04	-.623E+03	-.784E+02	-.103E+02	-.227E+02
	L-I	.649E-03	-.390E-02	-.176E-03	-.185E-03	-.378E-03	-.410E+03	-.863E+03	-.475E+03	-.873E+01	-.920E+01	-.188E+02
64	CEN	-.377E-03	-.266E-02	.353E-02	.369E-03	-.210E-03	-.468E+03	-.685E+03	-.432E+03	.168E+03	.175E+02	-.996E+01
	I-J	-.151E-03	-.266E-02	.283E-02	.281E-03	-.210E-03	-.414E+03	-.653E+03	-.400E+03	.134E+03	.134E+02	-.996E+01
	J-K	-.377E-03	-.472E-04	.269E-02	.369E-03	.116E-03	-.961E+02	-.648E+02	-.603E+02	.128E+03	.175E+02	.553E+01
	K-L	-.603E-03	-.266E-02	.423E-02	.457E-03	-.210E-03	-.521E+03	-.717E+03	-.464E+03	.201E+03	.217E+02	-.996E+01
	L-I	-.377E-03	-.527E-02	.437E-02	.369E-03	-.536E-03	-.839E+03	-.130E+04	-.804E+03	.207E+03	.175E+02	-.255E+02
65	CEN	-.173E-03	-.236E-04	.122E-01	-.349E-04	.582E-04	-.374E+02	-.253E+02	-.234E+02	.495E+03	-.142E+01	.237E+01
	I-J	-.336E-03	-.236E-04	.122E-01	-.244E-04	.582E-04	-.700E+02	-.447E+02	-.428E+02	.495E+03	-.993E+00	.237E+01
	J-K	-.173E-03	.000E+00	.131E-01	-.349E-04	.000E+00	-.346E+02	-.206E+02	-.206E+02	.532E+03	-.142E+01	.000E+00
	K-L	-.973E-05	-.236E-04	.122E-01	-.453E-04	.582E-04	-.476E+01	-.588E+01	-.397E+01	.495E+03	-.184E+01	.237E+01
	L-I	-.173E-03	-.472E-04	.113E-01	-.349E-04	.116E-03	-.402E+02	-.300E+02	-.262E+02	.458E+03	-.142E+01	.473E+01

66	CEN	-.119E-02	-.222E-02	-.585E-01	.446E-03	-.237E-03	-.314E+03	-.340E-04	-.340E-04	-.585E-03	.446E-05	-.237E-05
	I-J	-.119E-02	-.222E-02	-.551E-01	.123E-02	-.237E-03	-.315E+03	-.341E-04	-.341E-04	-.551E-03	.123E-04	-.237E-05
	J-K	-.119E-02	-.443E-02	-.585E-01	.446E-03	-.755E-03	-.314E+03	-.562E-04	-.562E-04	-.585E-03	.446E-05	-.755E-05
	K-L	-.118E-02	-.222E-02	-.618E-01	-.341E-03	-.237E-03	-.313E+03	-.340E-04	-.340E-04	-.618E-03	-.341E-05	-.237E-05
	L-I	-.119E-02	-.920E-06	-.585E-01	.446E-03	.282E-03	-.314E+03	-.119E-04	-.119E-04	-.585E-03	.446E-05	.282E-05
67	CEN	.840E-03	-.332E-02	-.230E-02	-.655E-03	-.273E-03	-.485E+03	-.102E+04	-.593E+03	-.147E+03	-.419E+02	-.175E+02
	I-J	.105E-02	-.332E-02	-.259E-02	-.784E-03	-.273E-03	-.409E+03	-.968E+03	-.543E+03	-.166E+03	-.502E+02	-.175E+02
	J-K	.840E-03	-.221E-02	-.307E-02	-.655E-03	.210E-03	-.220E+03	-.611E+03	-.328E+03	-.197E+03	-.419E+02	.134E+02
	K-L	.633E-03	-.332E-02	-.200E-02	-.526E-03	-.273E-03	-.561E+03	-.107E+04	-.642E+03	-.128E+03	-.336E+02	-.175E+02
	L-I	.840E-03	-.443E-02	-.152E-02	-.655E-03	-.755E-03	-.750E+03	-.142E+04	-.857E+03	-.976E+02	-.419E+02	-.484E+02
68	CEN	.259E-04	-.251E-02	-.105E-02	-.202E-03	.228E-03	-.599E+03	-.101E+04	-.603E+03	-.859E+02	-.166E+02	.187E+02
	I-J	.322E-03	-.251E-02	-.979E-03	-.206E-03	.228E-03	-.478E+03	-.942E+03	-.531E+03	-.804E+02	-.169E+02	.187E+02
	J-K	.259E-04	-.280E-02	-.235E-02	-.202E-03	.246E-03	-.670E+03	-.113E+04	-.675E+03	-.193E+03	-.166E+02	.202E+02
	K-L	-.270E-03	-.251E-02	-.111E-02	-.198E-03	.228E-03	-.719E+03	-.109E+04	-.675E+03	-.914E+02	-.163E+02	.187E+02
	L-I	.259E-04	-.221E-02	.256E-03	-.202E-03	.210E-03	-.527E+03	-.894E+03	-.531E+03	.210E+02	-.166E+02	.172E+02
69	CEN	-.852E-03	-.142E-02	.480E-02	.442E-03	.179E-03	-.404E+03	-.458E+03	-.323E+03	.226E+03	.208E+02	.844E+01
	I-J	-.603E-03	-.142E-02	.448E-02	.457E-03	.179E-03	-.345E+03	-.422E+03	-.288E+03	.212E+03	.216E+02	.844E+01
	J-K	-.852E-03	-.399E-04	.370E-02	.442E-03	.112E-03	-.207E+03	-.131E+03	-.127E+03	.175E+03	.208E+02	.529E+01
	K-L	-.110E-02	-.142E-02	.511E-02	.427E-03	.179E-03	-.463E+03	-.493E+03	-.359E+03	.241E+03	.201E+02	.844E+01
	L-I	-.852E-03	-.280E-02	.589E-02	.442E-03	.246E-03	-.600E+03	-.784E+03	-.520E+03	.278E+03	.208E+02	.116E+02
70	CEN	.129E-03	-.200E-04	.122E-01	-.538E-04	.561E-04	.197E+02	.192E+02	.193E+02	.218E+02	-.964E-01	.100E+00
	I-J	-.973E-05	-.200E-04	.122E-01	-.453E-04	.561E-04	-.530E+01	-.533E+01	-.526E+01	.218E+02	-.812E-01	.100E+00
	J-K	.129E-03	.000E+00	.131E-01	-.538E-04	.000E+00	.233E+02	.228E+02	.228E+02	.234E+02	-.964E-01	.000E+00
	K-L	.267E-03	-.200E-04	.122E-01	-.623E-04	.561E-04	.448E+02	.438E+02	.438E+02	.218E+02	-.112E+00	.100E+00
	L-I	.129E-03	-.399E-04	.113E-01	-.538E-04	.112E-03	.162E+02	.156E+02	.157E+02	.202E+02	-.964E-01	.201E+00
71	CEN	-.825E-03	-.168E-02	-.642E-01	-.722E-03	.308E-04	-.232E+03	-.251E-04	-.251E-04	-.642E-03	-.722E-05	.308E-06
	I-J	-.118E-02	-.168E-02	-.616E-01	-.341E-03	.308E-04	-.332E+03	-.287E-04	-.287E-04	-.616E-03	-.341E-05	.308E-06
	J-K	-.825E-03	-.337E-02	-.639E-01	-.722E-03	-.221E-03	-.232E+03	-.419E-04	-.419E-04	-.639E-03	-.722E-05	-.221E-05
	K-L	-.468E-03	-.168E-02	-.667E-01	-.110E-02	.308E-04	-.132E+03	-.215E-04	-.215E-04	-.667E-03	-.110E-04	.308E-06
	L-I	-.825E-03	-.734E-06	-.644E-01	-.722E-03	.282E-03	-.232E+03	-.826E-05	-.826E-05	-.644E-03	-.722E-05	.282E-05
72	CEN	.538E-03	-.245E-02	-.889E-03	-.488E-03	-.806E-04	-.378E+03	-.773E+03	-.449E+03	-.588E+02	-.323E+02	-.534E+01
	I-J	.633E-03	-.245E-02	-.114E-02	-.526E-03	-.806E-04	-.343E+03	-.750E+03	-.426E+03	-.752E+02	-.348E+02	-.534E+01
	J-K	.538E-03	-.152E-02	-.124E-02	-.488E-03	.595E-04	-.161E+03	-.434E+03	-.232E+03	-.823E+02	-.323E+02	.394E+01
	K-L	.444E-03	-.245E-02	-.642E-03	-.451E-03	-.806E-04	-.412E+03	-.795E+03	-.471E+03	-.425E+02	-.298E+02	-.534E+01
	L-I	.538E-03	-.337E-02	-.534E-03	-.488E-03	-.221E-03	-.594E+03	-.111E+04	-.666E+03	-.354E+02	-.323E+02	-.146E+02
73	CEN	-.945E-03	-.143E-02	-.147E-02	-.198E-03	.603E-04	-.729E+03	-.813E+03	-.566E+03	-.127E+03	-.171E+02	.521E+01
	I-J	-.270E-03	-.143E-02	-.149E-02	-.198E-03	.603E-04	-.452E+03	-.652E+03	-.405E+03	-.129E+03	-.171E+02	.521E+01
	J-K	-.945E-03	-.133E-02	-.144E-02	-.198E-03	.612E-04	-.706E+03	-.772E+03	-.543E+03	-.383E+03	-.171E+02	.528E+01
	K-L	-.162E-02	-.143E-02	-.145E-02	-.198E-03	.603E-04	-.101E+04	-.973E+03	-.727E+03	-.125E+03	-.171E+02	.521E+01
	L-I	-.945E-03	-.152E-02	.149E-02	-.198E-03	.595E-04	-.753E+03	-.853E+03	-.589E+03	.129E+03	-.171E+02	.513E+01
74	CEN	-.112E-02	-.679E-03	.423E-02	.432E-03	.857E-04	-.569E+03	-.513E+03	-.427E+03	.268E+03	.274E+02	.542E+01
	I-J	-.110E-02	-.679E-03	.408E-02	.427E-03	.857E-04	-.562E+03	-.508E+03	-.422E+03	.258E+03	.270E+02	.542E+01
	J-K	-.112E-02	-.281E-04	.415E-02	.432E-03	.110E-03	-.414E+03	-.276E+03	-.272E+03	.263E+03	.274E+02	.697E+01
	K-L	-.114E-02	-.679E-03	.438E-02	.438E-03	.857E-04	-.575E+03	-.517E+03	-.431E+03	.277E+03	.277E+02	.542E+01
	L-I	-.112E-02	-.133E-02	.431E-02	.432E-03	.612E-04	-.723E+03	-.749E+03	-.581E+03	.273E+03	.274E+02	.387E+01
75	CEN	.407E-03	-.141E-04	.122E-01	-.707E-04	.551E-04	.728E+02	.712E+02	.713E+02	.223E+02	-.130E+00	.101E+00
	I-J	.267E-03	-.141E-04	.122E-01	-.623E-04	.551E-04	.469E+02	.459E+02	.460E+02	.223E+02	-.114E+00	.101E+00
	J-K	.407E-03	.000E+00	.131E-01	-.707E-04	.000E+00	.753E+02	.739E+02	.739E+02	.240E+02	-.130E+00	.000E+00
	K-L	.546E-03	-.141E-04	.122E-01	-.790E-04	.551E-04	.986E+02	.966E+02	.966E+02	.223E+02	-.145E+00	.101E+00
	L-I	.407E-03	-.281E-04	.113E-01	-.707E-04	.110E-03	.702E+02	.686E+02	.687E+02	.207E+02	-.130E+00	.202E+00

BENDING ELEMENT FORCES AND MOMENTS

EL.NO.	1-P1	1-P2	1-P3	1-M1	1-M2	1-M3	2-P1	2-P2	2-P3	2-M1	2-M2	2-M3
76	.426E+03	-.230E-02	.174E+03	.249E-03	.527E-01	-.173E-01	-.426E+03	.230E-02	-.174E+03	-.249E-03	-.304E+03	-.288E-01
77	.532E+03	-.145E-01	.680E+03	.108E-03	.304E+03	.144E-01	-.532E+03	.145E-01	-.680E+03	-.108E-03	-.149E+04	-.590E-01
78	.646E+03	.501E+02	.133E+04	-.574E-04	.149E+04	.520E-01	-.646E+03	-.501E+02	-.133E+04	.574E-04	-.424E+04	.104E+03
79	.770E+03	.501E+02	.210E+04	.123E-04	.424E+04	-.104E+03	-.770E+03	-.501E+02	-.210E+04	-.123E-04	-.859E+04	.207E+03
80	-.708E+02	-.612E-07	-.174E-05	-.308E-08	.231E-05	-.729E-07	.708E+02	.612E-07	.174E-05	.308E-08	.526E-06	-.270E-07
81	-.460E+03	.412E-08	.707E-07	-.308E-08	-.526E-06	.270E-07	.460E+03	-.412E-08	-.707E-07	.308E-08	-.128E-06	.111E-07
82	-.203E+03	-.172E-08	-.179E-07	-.308E-08	.128E-06	-.111E-07	.203E+03	.172E-08	.179E-07	.308E-08	.673E-07	-.765E-08
83	.255E+03	.365E-08	.111E-07	-.308E-08	-.673E-07	.765E-08	-.255E+03	-.365E-08	-.111E-07	.308E-08	-.533E-07	.321E-07
84	.625E+04	-.479E+02	.578E+03	.660E-02	-.269E-01	.238E-02	-.625E+04	.479E+02	-.578E+03	-.660E-02	-.101E+04	-.838E+02
85	.887E+04	-.956E+02	-.590E+03	-.210E-02	.101E+04	.838E+02	-.887E+04	.956E+02	.590E+03	.210E-02	.211E+02	-.251E+03
86	.105E+05	.742E+02	.859E+03	-.235E-01	-.211E+02	.251E+03	-.105E+05	-.742E+02	-.859E+03	.235E-01	-.176E+04	-.976E+02
87	.121E+05	.351E+02	-.137E+03	-.878E-03	.176E+04	.976E+02	-.121E+05	-.351E+02	.137E+03	.878E-03	-.147E+04	-.249E+02
88	.110E+05	.184E+02	-.108E+04	.232E-01	.147E+04	.249E+02	-.110E+05	-.184E+02	.108E+04	-.232E-01	-.113E+00	.143E-02
89	.562E+03	-.948E+01	.395E+03	.426E-02	-.173E+02	-.521E-01	-.562E+03	.948E+01	-.395E+03	-.426E-02	-.464E+03	-.117E+02
90	.280E+04	.574E+01	-.878E+04	-.153E+03	.815E+04	-.140E+02	-.280E+04	-.574E+01	.878E+04	.153E+03	.282E+04	.211E+02
91	.270E+04	-.390E+01	-.219E+04	-.153E+03	-.283E+04	-.211E+02	-.270E+04	.390E+01	.219E+04	.153E+03	.554E+04	.162E+02
92	.317E+04	-.599E+01	-.495E+04	-.207E+03	-.239E+04	-.723E+01	-.317E+04	.599E+01	.495E+04	.207E+03	.860E+04	-.241E+00
93	.929E+04	-.171E+02	.754E+03	.433E-04	-.771E+04	-.156E+03	-.929E+04	.171E+02	-.754E+03	-.433E-04	.167E+03	-.155E+02
94	.310E+04	-.529E+01	.272E+03	.242E-04	-.315E+04	-.548E+02	-.310E+04	.529E+01	-.272E+03	-.242E-04	.430E+03	.185E+01
95	.925E+04	.188E+01	.324E+02	.378E-04	-.167E+03	.155E+02	-.925E+04	-.188E+01	-.324E+02	-.378E-04	-.158E+03	.333E+01
96	.560E+04	-.103E+00	.321E+02	.392E-04	-.430E+03	-.185E+01	-.560E+04	.103E+00	-.321E+02	-.392E-04	.109E+03	.812E+00
97	.921E+04	-.307E+00	.170E+02	-.541E-05	.158E+03	-.333E+01	-.921E+04	.307E+00	-.170E+02	.541E-05	-.328E+03	.267E+00
98	.738E+04	-.104E+00	-.625E+01	.627E-05	-.109E+03	-.812E+00	-.738E+04	.104E+00	.625E+01	-.627E-05	.171E+03	-.224E+00
99	.810E+04	-.267E-01	-.328E+02	-.450E-05	.328E+03	-.267E+00	-.810E+04	.267E-01	.328E+02	.450E-05	.134E-02	-.216E-05
100	.712E+04	.224E-01	.171E+02	-.683E-06	-.171E+03	.224E+00	-.712E+04	-.224E-01	-.171E+02	.683E-06	.867E-03	.553E-05

DEVELOPED FORCES AND MOMENTS PER FOOT OF ABUTMENT
FOR AXIAL THRUST TENSION IS POSITIVE
FOR BENDING MOMENT TENSION ON THE BACKFILL SIDE IS POSITIVE

TIE-ROD LEVEL AXIAL THRUST OF ABUT STEM -.646E+03 LB/FT
SHEAR FORCE .133E+04 LB/FT
BENDING MOMENT .149E+04 FT-LB/FT

AT THE BOTTOM OF ABUT STEM AXIAL THRUST -.770E+03 LB/FT
SHEAR FORCE .210E+04 LB/FT
BENDING MOMENT .859E+04 FT-LB/FT

66	CEN	-.119E-02	-.222E-02	-.585E-01	.446E-03	-.237E-03	-.314E+03	-.340E-04	-.340E-04	-.585E-03	.446E-05	-.237E-05
	I-J	-.119E-02	-.222E-02	-.551E-01	.123E-02	-.237E-03	-.315E+03	-.341E-04	-.341E-04	-.551E-03	.123E-04	-.237E-05
	J-K	-.119E-02	-.443E-02	-.585E-01	.446E-03	-.755E-03	-.314E+03	-.562E-04	-.562E-04	-.585E-03	.446E-05	-.755E-05
	K-L	-.118E-02	-.222E-02	-.618E-01	-.341E-03	-.237E-03	-.313E+03	-.340E-04	-.340E-04	-.618E-03	-.341E-05	-.237E-05
	L-I	-.119E-02	-.920E-06	-.585E-01	.446E-03	.282E-03	-.314E+03	-.119E-04	-.119E-04	-.585E-03	.446E-05	.282E-05
67	CEN	.840E-03	-.332E-02	-.230E-02	-.655E-03	-.273E-03	-.485E+03	-.102E+04	-.593E+03	-.147E+03	-.419E+02	-.175E+02
	I-J	.105E-02	-.332E-02	-.259E-02	-.784E-03	-.273E-03	-.409E+03	-.968E+03	-.543E+03	-.166E+03	-.502E+02	-.175E+02
	J-K	.840E-03	-.221E-02	-.307E-02	-.655E-03	.210E-03	-.220E+03	-.611E+03	-.328E+03	-.197E+03	-.419E+02	.134E+02
	K-L	.633E-03	-.332E-02	-.200E-02	-.526E-03	-.273E-03	-.561E+03	-.107E+04	-.642E+03	-.128E+03	-.336E+02	-.175E+02
	L-I	.840E-03	-.443E-02	-.152E-02	-.655E-03	-.755E-03	-.750E+03	-.142E+04	-.857E+03	-.976E+02	-.419E+02	-.484E+02
68	CEN	.259E-04	-.251E-02	-.105E-02	-.202E-03	.228E-03	-.599E+03	-.101E+04	-.603E+03	-.859E+02	-.166E+02	.187E+02
	I-J	.322E-03	-.251E-02	-.979E-03	-.206E-03	.228E-03	-.478E+03	-.942E+03	-.531E+03	-.804E+02	-.169E+02	.187E+02
	J-K	.259E-04	-.280E-02	-.235E-02	-.202E-03	.246E-03	-.670E+03	-.113E+04	-.675E+03	-.193E+03	-.166E+02	.202E+02
	K-L	-.270E-03	-.251E-02	-.111E-02	-.198E-03	.228E-03	-.719E+03	-.109E+04	-.675E+03	-.914E+02	-.163E+02	.187E+02
	L-I	.259E-04	-.221E-02	.256E-03	-.202E-03	.210E-03	-.527E+03	-.894E+03	-.531E+03	.210E+02	-.166E+02	.172E+02
69	CEN	-.852E-03	-.142E-02	.480E-02	.442E-03	.179E-03	-.404E+03	-.458E+03	-.323E+03	.226E+03	.208E+02	.844E+01
	I-J	-.603E-03	-.142E-02	.448E-02	.457E-03	.179E-03	-.345E+03	-.422E+03	-.288E+03	.212E+03	.216E+02	.844E+01
	J-K	-.852E-03	-.399E-04	.370E-02	.442E-03	.112E-03	-.207E+03	-.131E+03	-.127E+03	.175E+03	.208E+02	.529E+01
	K-L	-.110E-02	-.142E-02	.511E-02	.427E-03	.179E-03	-.463E+03	-.493E+03	-.359E+03	.241E+03	.201E+02	.844E+01
	L-I	-.852E-03	-.280E-02	.589E-02	.442E-03	.246E-03	-.600E+03	-.784E+03	-.520E+03	.278E+03	.208E+02	.116E+02
70	CEN	.129E-03	-.200E-04	.122E-01	-.538E-04	.561E-04	.197E+02	.192E+02	.193E+02	.218E+02	-.964E-01	.100E+00
	I-J	-.973E-05	-.200E-04	.122E-01	-.453E-04	.561E-04	-.530E+01	-.533E+01	-.526E+01	.218E+02	-.812E-01	.100E+00
	J-K	.129E-03	.000E+00	.131E-01	-.538E-04	.000E+00	.233E+02	.228E+02	.228E+02	.234E+02	-.964E-01	.000E+00
	K-L	.267E-03	-.200E-04	.122E-01	-.623E-04	.561E-04	.448E+02	.438E+02	.438E+02	.218E+02	-.112E+00	.100E+00
	L-I	.129E-03	-.399E-04	.113E-01	-.538E-04	.112E-03	.162E+02	.156E+02	.157E+02	.202E+02	-.964E-01	.201E+00
71	CEN	-.825E-03	-.168E-02	-.642E-01	-.722E-03	.308E-04	-.232E+03	-.251E-04	-.251E-04	-.642E-03	-.722E-05	.308E-06
	I-J	-.118E-02	-.168E-02	-.616E-01	-.341E-03	.308E-04	-.332E+03	-.287E-04	-.287E-04	-.616E-03	-.341E-05	.308E-06
	J-K	-.825E-03	-.337E-02	-.639E-01	-.722E-03	-.221E-03	-.232E+03	-.419E-04	-.419E-04	-.639E-03	-.722E-05	-.221E-05
	K-L	-.468E-03	-.168E-02	-.667E-01	-.110E-02	.308E-04	-.132E+03	-.215E-04	-.215E-04	-.667E-03	-.110E-04	.308E-06
	L-I	-.825E-03	-.734E-06	-.644E-01	-.722E-03	.282E-03	-.232E+03	-.826E-05	-.826E-05	-.644E-03	-.722E-05	.282E-05
72	CEN	.538E-03	-.245E-02	-.889E-03	-.488E-03	-.806E-04	-.378E+03	-.773E+03	-.449E+03	-.588E+02	-.323E+02	-.534E+01
	I-J	.633E-03	-.245E-02	-.114E-02	-.526E-03	-.806E-04	-.343E+03	-.750E+03	-.426E+03	-.752E+02	-.348E+02	-.534E+01
	J-K	.538E-03	-.152E-02	-.124E-02	-.488E-03	.595E-04	-.161E+03	-.434E+03	-.232E+03	-.823E+02	-.323E+02	.394E+01
	K-L	.444E-03	-.245E-02	-.642E-03	-.451E-03	-.806E-04	-.412E+03	-.795E+03	-.471E+03	-.425E+02	-.298E+02	-.534E+01
	L-I	.538E-03	-.337E-02	-.534E-03	-.488E-03	-.221E-03	-.594E+03	-.111E+04	-.666E+03	-.354E+02	-.323E+02	-.146E+02
73	CEN	-.945E-03	-.143E-02	-.147E-02	-.198E-03	.603E-04	-.729E+03	-.813E+03	-.566E+03	-.127E+03	-.171E+02	.521E+01
	I-J	-.270E-03	-.143E-02	-.149E-02	-.198E-03	.603E-04	-.452E+03	-.652E+03	-.405E+03	-.129E+03	-.171E+02	.521E+01
	J-K	-.945E-03	-.133E-02	-.444E-02	-.198E-03	.612E-04	-.706E+03	-.772E+03	-.543E+03	-.383E+03	-.171E+02	.528E+01
	K-L	-.162E-02	-.143E-02	-.145E-02	-.198E-03	.603E-04	-.101E+04	-.973E+03	-.727E+03	-.125E+03	-.171E+02	.521E+01
	L-I	-.945E-03	-.152E-02	.149E-02	-.198E-03	.595E-04	-.753E+03	-.853E+03	-.589E+03	.129E+03	-.171E+02	.513E+01
74	CEN	-.112E-02	-.679E-03	.423E-02	.432E-03	.857E-04	-.569E+03	-.513E+03	-.427E+03	.268E+03	.274E+02	.542E+01
	I-J	-.110E-02	-.679E-03	.408E-02	.427E-03	.857E-04	-.562E+03	-.508E+03	-.422E+03	.258E+03	.270E+02	.542E+01
	J-K	-.112E-02	-.281E-04	.415E-02	.432E-03	.110E-03	-.414E+03	-.276E+03	-.272E+03	.263E+03	.274E+02	.697E+01
	K-L	-.114E-02	-.679E-03	.438E-02	.438E-03	.857E-04	-.575E+03	-.517E+03	-.431E+03	.277E+03	.277E+02	.542E+01
	L-I	-.112E-02	-.133E-02	.431E-02	.432E-03	.612E-04	-.723E+03	-.749E+03	-.581E+03	.273E+03	.274E+02	.387E+01
75	CEN	.407E-03	-.141E-04	.122E-01	-.707E-04	.551E-04	.728E+02	.712E+02	.713E+02	.223E+02	-.130E+00	.101E+00
	I-J	.267E-03	-.141E-04	.122E-01	-.623E-04	.551E-04	.469E+02	.459E+02	.460E+02	.223E+02	-.114E+00	.101E+00
	J-K	.407E-03	.000E+00	.131E-01	-.707E-04	.000E+00	.753E+02	.739E+02	.739E+02	.240E+02	-.130E+00	.000E+00
	K-L	.546E-03	-.141E-04	.122E-01	-.790E-04	.551E-04	.986E+02	.966E+02	.966E+02	.223E+02	-.145E+00	.101E+00
	L-I	.407E-03	-.281E-04	.113E-01	-.707E-04	.110E-03	.702E+02	.686E+02	.687E+02	.207E+02	-.130E+00	.202E+00

BENDING ELEMENT FORCES AND MOMENTS

EL.NO.	1-P1	1-P2	1-P3	1-M1	1-M2	1-M3	2-P1	2-P2	2-P3	2-M1	2-M2	2-M3
76	.426E+03	-.230E-02	.174E+03	.249E-03	.527E-01	-.173E-01	-.426E+03	.230E-02	-.174E+03	-.249E-03	-.304E+03	-.288E-01
77	.532E+03	-.145E-01	.680E+03	.108E-03	.304E+03	.144E-01	-.532E+03	.145E-01	-.680E+03	-.108E-03	-.149E+04	-.590E-01
78	.646E+03	.501E+02	.133E+04	-.574E-04	.149E+04	.520E-01	-.646E+03	-.501E+02	-.133E+04	.574E-04	-.424E+04	.104E+03
79	.770E+03	.501E+02	.210E+04	.123E-04	.424E+04	-.104E+03	-.770E+03	-.501E+02	-.210E+04	-.123E-04	-.859E+04	.207E+03
80	-.708E+02	-.612E-07	-.174E-05	-.308E-08	.231E-05	-.729E-07	.708E+02	.612E-07	.174E-05	.308E-08	.526E-06	-.270E-07
81	-.460E+03	.412E-08	.707E-07	-.308E-08	-.526E-06	.270E-07	.460E+03	-.412E-08	-.707E-07	.308E-08	-.128E-06	.111E-07
82	-.203E+03	-.172E-08	-.179E-07	-.308E-08	.128E-06	-.111E-07	.203E+03	.172E-08	.179E-07	.308E-08	.673E-07	-.765E-08
83	.255E+03	.365E-08	.111E-07	-.308E-08	-.673E-07	.765E-08	-.255E+03	-.365E-08	-.111E-07	.308E-08	-.533E-07	.321E-07
84	.625E+04	-.479E+02	.578E+03	.660E-02	-.269E-01	.238E-02	-.625E+04	.479E+02	-.578E+03	-.660E-02	-.101E+04	-.838E+02
85	.887E+04	-.956E+02	-.590E+03	-.210E-02	.101E+04	.838E+02	-.887E+04	.956E+02	.590E+03	.210E-02	.211E+02	-.251E+03
86	.105E+05	.742E+02	.859E+03	-.235E-01	-.211E+02	.251E+03	-.105E+05	-.742E+02	-.859E+03	.235E-01	-.176E+04	-.976E+02
87	.121E+05	.351E+02	-.137E+03	-.878E-03	.176E+04	.976E+02	-.121E+05	-.351E+02	.137E+03	.878E-03	-.147E+04	-.249E+02
88	.110E+05	.184E+02	-.108E+04	.232E-01	.147E+04	.249E+02	-.110E+05	-.184E+02	.108E+04	-.232E-01	-.113E+00	.143E-02
89	.562E+03	-.948E+01	.395E+03	.426E-02	-.173E+02	-.521E-01	-.562E+03	.948E+01	-.395E+03	-.426E-02	-.464E+03	-.117E+02
90	.280E+04	.574E+01	-.878E+04	-.153E+03	.815E+04	-.140E+02	-.280E+04	-.574E+01	.878E+04	.153E+03	.282E+04	.211E+02
91	.270E+04	-.390E+01	-.219E+04	-.153E+03	-.283E+04	-.211E+02	-.270E+04	.390E+01	.219E+04	.153E+03	.554E+04	.162E+02
92	.317E+04	-.599E+01	-.495E+04	-.207E+03	-.239E+04	-.723E+01	-.317E+04	.599E+01	.495E+04	.207E+03	.860E+04	-.241E+00
93	.929E+04	-.171E+02	.754E+03	.433E-04	-.771E+04	-.156E+03	-.929E+04	.171E+02	-.754E+03	-.433E-04	.167E+03	-.155E+02
94	.310E+04	-.529E+01	.272E+03	.242E-04	-.315E+04	-.548E+02	-.310E+04	.529E+01	-.272E+03	-.242E-04	.430E+03	.185E+01
95	.925E+04	.188E+01	.324E+02	.378E-04	-.167E+03	.155E+02	-.925E+04	-.188E+01	-.324E+02	-.378E-04	-.158E+03	.333E+01
96	.560E+04	-.103E+00	.321E+02	.392E-04	-.430E+03	-.185E+01	-.560E+04	.103E+00	-.321E+02	-.392E-04	.109E+03	.812E+00
97	.921E+04	-.307E+00	.170E+02	-.541E-05	.158E+03	-.333E+01	-.921E+04	.307E+00	-.170E+02	.541E-05	-.328E+03	.267E+00
98	.738E+04	-.104E+00	-.625E+01	.627E-05	-.109E+03	-.812E+00	-.738E+04	.104E+00	.625E+01	-.627E-05	.171E+03	-.224E+00
99	.810E+04	-.267E-01	-.328E+02	-.450E-05	.328E+03	-.267E+00	-.810E+04	.267E-01	.328E+02	.450E-05	.134E-02	-.216E-05
100	.712E+04	.224E-01	.171E+02	-.683E-06	-.171E+03	.224E+00	-.712E+04	-.224E-01	-.171E+02	.683E-06	.867E-03	.553E-05

DEVELOPED FORCES AND MOMENTS PER FOOT OF ABUTMENT
FOR AXIAL THRUST TENSION IS POSITIVE
FOR BENDING MOMENT TENSION ON THE BACKFILL SIDE IS POSITIVE

TIE-ROD LEVEL	AXIAL THRUST OF ABUT STEM	-.646E+03 LB/FT
	SHEAR FORCE	.133E+04 LB/FT
	BENDING MOMENT	.149E+04 FT-LB/FT

AT THE BOTTOM OF ABUT STEM	AXIAL THRUST	-.770E+03 LB/FT
	SHEAR FORCE	.210E+04 LB/FT
	BENDING MOMENT	.859E+04 FT-LB/FT

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APPENDIX

Program PLOT/PLOT2

The programs PLOT and PLOT2 have been written for the purpose of plotting the finite element grid on the monitor and obtaining a hard copy on a printer. A data file, XYDATA, is generated by the programs BULK and BART and is ready for use by the programs PLOT and PLOT2.

These programs automatically determine the graphics mode available on the computer. They can use any of the following graphics modes; CGA, OCGA, EGA, OEGA, VGA, OVGA, MCGA, and HGA. If graphics mode is not available, a message (error: can not set graphics mode) will appear and the program terminates.

The output includes dotted lines and solid lines. The former represent structural elements, whereas the latter are used for soil continuum elements. A hard copy of the grid plot may be obtained by using the 'PRINT SCREEN' key. Note that the printer must be in graphics mode for this purpose.

To use the plotting program, first copy the programs PLOT and PLOT2 to the same directory where the program BULK or BART is located. If you use a Hercules graphics mode, run the program SCRNDUMP before using the program PLOT or PLOT2.

To run the plotting program, type in 'PLOT' after you complete execution of the program BULK or BART. A finite element grid will then appear. If you use the VGA graphics mode with DOS 3.3 or earlier version, nothing will appear on the screen. In this case, try program PLOT2. Program PLOT2 simulates the VGA mode with EGA.

While you review the finite element grid, you can enter any desired node number(s) or element number(s) that you wish to locate on the grid. An option is provided so that all node and element numbers appear. However, this option is not recommended, because the numbers may overlap and therefore not all numbers will be visible. Fig-7 illustrates a typical finite element grid plot generated by the programs BULK and PLOT with several node and element numbers identified.

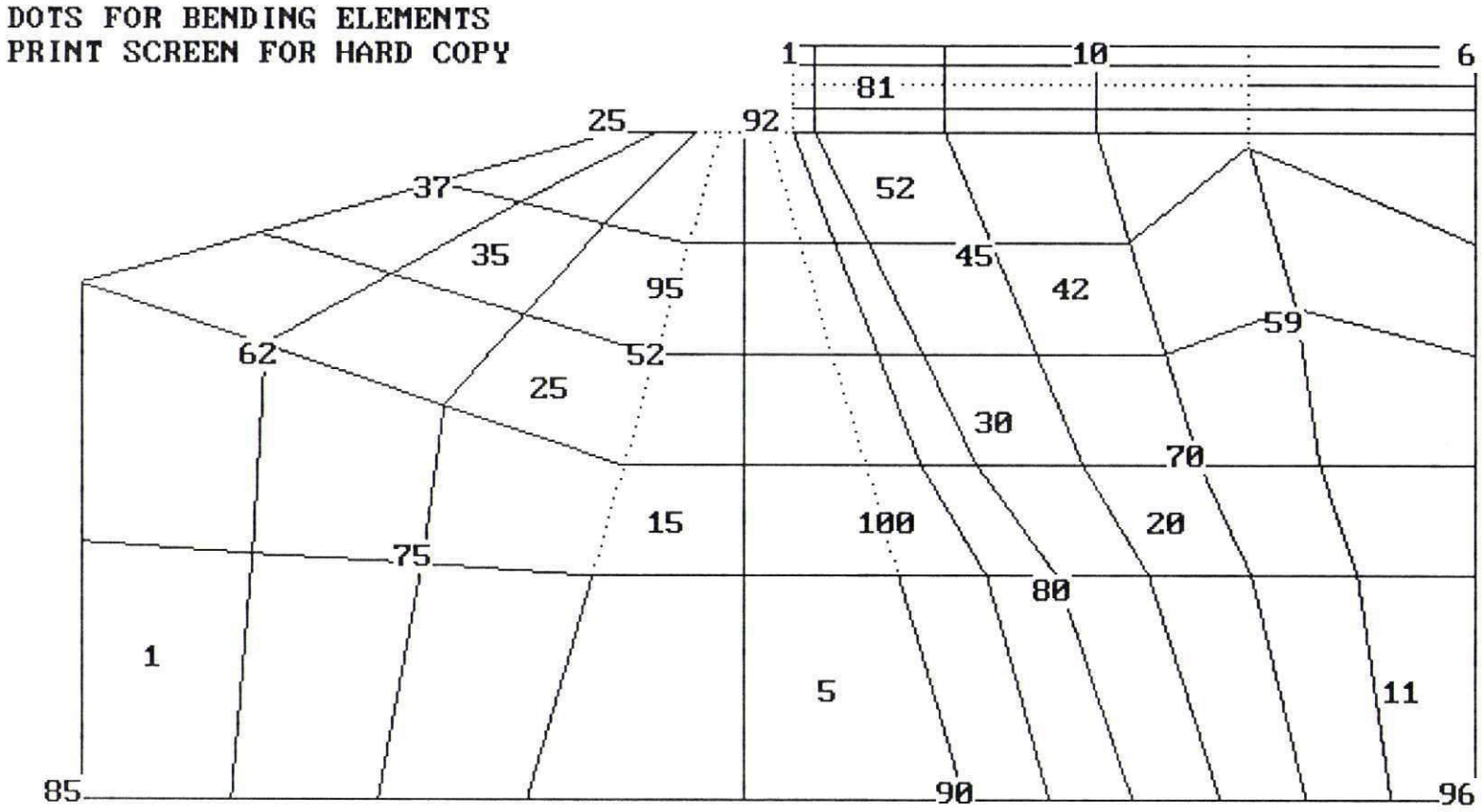

Figure 6. Finite Element Grid Plot