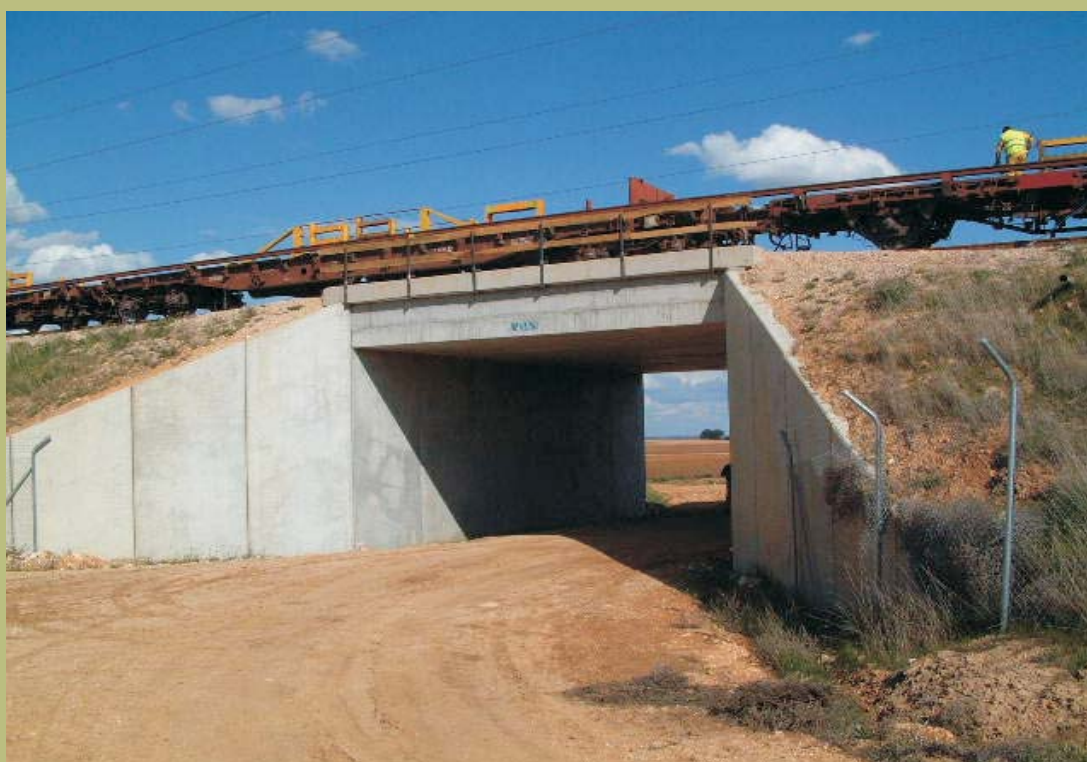


**CONTRATO DE CONSULTORÍA Y ASISTENCIA  
PARA LA REALIZACIÓN DE PRUEBAS DE CARGA  
PARA LA RECEPCIÓN DE PUENTES DE LA  
LÍNEA DE ALTA VELOCIDAD  
MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA.  
TRAMO: POZO DE GUADALAJARA-ALCOLEA DEL PINAR.  
BASE DE BRIHUEGA.**



**INFORME DE PRUEBA DE CARGA**

**SUBTRAMO V- $\alpha$   
P.I.  
06PI04**

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## **1.- INTRODUCCIÓN.**

### **1.1.- INTRODUCCIÓN.**

A instancias del ente público Gestor de Infraestructuras Ferroviarias (GIF) se redacta el presente informe, que forma parte del conjunto de los trabajos relativos a la prestación de los servicios de Consultoría y Asistencia en la realización de las preceptivas Pruebas de Carga para la recepción de puentes en el tramo Madrid - Zaragoza, de la línea de Alta Velocidad Madrid - Zaragoza - Barcelona - Frontera Francesa, previas a la recepción y puesta en servicio de los mismos, cuyos términos se incluyen en el contrato suscrito por Tecnología e Investigación Ferroviaria, S.A. (TIFSA)

Los puentes sobre los que se ha actuado se encuentran situados en el trayecto Pozo de Guadalajara – Alcolea del Pinar de la línea, correspondientes al montaje de la vía a partir de la base de trabajo de Brihuega. Este informe en concreto se refiere al **P.I.** con identificación **06PI04** perteneciente al **Subtramo V-a.**

Para la redacción de los trabajos objeto del contrato se han tenido en cuenta todas las normas, instrucciones y recomendaciones que estableció el ente público Gestor de Infraestructuras Ferroviarias (GIF)

### **1.2.- ANTECEDENTES.**

La "Instrucción relativa a las acciones a considerar en el proyecto de puentes de ferrocarril" de fecha 25 de junio de 1975, reglamenta en su apartado 6 la metodología a realizar en las pruebas de carga de puentes, haciendo distinción entre las diferentes tipologías, metálicos y de fábrica, y teniendo en cuenta sus luces.

En dicho apartado se indica la necesidad de realizar pruebas de carga estáticas y dinámicas en la recepción de obra nueva y se prescriben las condiciones para las pruebas de carga de obra en servicio. Siguiendo la instrucción actual, se contempla la obligatoriedad de la realización de pruebas estáticas y dinámicas en puentes de nueva construcción, como el que se corresponde con el presente informe, para comprobar su comportamiento ante las cargas previstas y poder efectuar su recepción.

## **2.- OBJETO.**

El objeto del informe es presentar las actividades de prueba de carga desarrolladas en la obra de referencia, exponiendo los resultados obtenidos en la misma, al ser solicitada la estructura por un tren de cargas conocido circulando a distintas velocidades (pruebas dinámicas), así como en una posición conocida de velocidad nula (prueba estática), realizando su análisis, con el fin de emitir las conclusiones y recomendaciones oportunas, al contrastar los valores con los resultantes del cálculo teórico efectuado.

Las actividades desarrolladas consistieron en:

- Inspección preliminar de la estructura. Se realizó el día 9 de abril de 2002 con el objeto de analizar el estado actual de la estructura, y de los elementos de apoyo, en función de sus posibles defectos; así como determinar aquellas anomalías que puedan afectar al funcionamiento, durabilidad o estética de la estructura.
- Redacción del plan de pruebas. Con el objeto de definir el tren de cargas empleado y la instrumentación utilizada, así como efectuar una previsión de los resultados a obtener.
- Realización de la Prueba de Carga. Tuvo lugar el día 31 de julio de 2002.
- Análisis de Resultados y Recomendaciones. Donde se estudia la relación entre las deformaciones obtenidas y las previstas, las frecuencias de vibración, el porcentaje y rapidez de deformación; y finalmente se establece un juicio sobre el comportamiento de la obra durante la prueba.

### **3.- DESCRIPCIÓN DE LA OBRA.**

La estructura objeto de la Prueba de Carga forma parte de las obras de construcción de la Línea de Alta Velocidad Madrid-Barcelona-Frontera Francesa, y pertenece al Subtramo V-a del tramo Pozo de Guadalajara-Alcolea del Pinar y se encuentra situada en el PK 513+360.

Se trata de un marco cerrado de hormigón armado de 9,00 m de longitud y una anchura de 13,951 m con una luz libre inferior de 8,00 m.

La estructura está compuesta por una losa inferior de 0,95 m de espesor hormigonada in situ sobre la que se montan los hastiales formados por paneles prefabricados de 0,50 m de espesor hasta completar la anchura del puente. La altura de coronación de los hastiales así formados es de 4,90 m sobre la losa inferior. La distancia entre sus ejes es de 8,50 m. prolongándose mediante aletas a ambos lados que forman 30° con el eje transversal del puente.

El tablero descansa sobre los hastiales y está formado por una capa inferior de piezas prefabricadas de hormigón armado de 0,40 m de espesor y una capa superior de compresión hormigonada in situ de 0,55 m de espesor alcanzando el canto total del tablero 0,95 m.

La documentación facilitada es el Proyecto Construido del Subtramo V-a del tramo Pozo de Guadalajara-Alcolea del Pinar de la línea de Alta Velocidad Madrid-Zaragoza-Barcelona-Frontera Francesa, disponiéndose tanto de Planos como del Anejo de Cálculo correspondiente.

En el Anejo 2A contenido dentro del ANEJO 2 - Proyecto de Prueba de Carga, se incluye copia de algunos de los planos facilitados.

#### **4.- INSPECCIÓN PRELIMINAR.**

Durante los trabajos de Inspección Preliminar llevados a cabo el día 9 de abril de 2002, en la obra **P.I. (06PI04)** previos a la ejecución de la Prueba de Carga se comprobaron los distintos elementos estructurales del Paso Inferior que nos ocupa sin detectar daños o defectos de importancia en la estructura.

Cabe indicar que en el momento de la inspección las barandillas laterales colocadas en el tablero eran provisionales.

En el ANEJO 7 - Ficha de Seguimiento (Revisión 0), del presente informe pueden seguirse las fichas detalladas con indicación de los distintos defectos e incidencias observadas durante la inspección. Es preciso reseñar que el estado de la estructura antes y después de la prueba de carga sigue siendo el mismo, es decir, que no ha aparecido ningún defecto adicional.

#### **5.- ANÁLISIS DEL PROYECTO DE LA ESTRUCTURA.**

La documentación facilitada es el Proyecto Construido, disponiéndose tanto de Planos como del Anejo de Cálculo correspondiente.

##### ***5.1.- Definición completa de elementos.***

Se trata de un marco cerrado de hormigón armado de 9,00 m de longitud y una anchura de 13,951 m con una luz libre inferior de 8,00 m.

La estructura está compuesta por una losa inferior de 0,95 m de espesor hormigonada in situ sobre la que se montan los hastiales formados por paneles prefabricados de 0,50 m de espesor hasta completar la anchura del puente. La altura de coronación de los hastiales así formados es de 4,90 m sobre la losa inferior. La distancia entre sus ejes es de 8,50 m. prolongándose mediante aletas a ambos lados que forman 30° con el eje transversal del puente.

El tablero descansa sobre los hastiales y está formado por una capa inferior de piezas prefabricadas de hormigón armado de 0,40 m de espesor y una capa superior de compresión hormigonada in situ de 0,55 m de espesor alcanzando el canto total del tablero 0,95 m.

### **5.2.- Acciones consideradas.**

Acciones consideradas actuantes sobre la estructura:

1) Según IPF-75:

- 1.- Peso Propio del marco
- 2.- Cargas permanentes (Conjunto plataforma de vía).
  - Balasto
  - Vías y traviesas
  - Arquetas
  - Hormigón de forma
- 3.- Empuje de relleno de tierras sobre hastiales
- 4.- Relleno superior de tierras
- 5.- Sobrecarga uniforme de  $3 \text{ t/m}^2$

Para acciones 3, 4 y 5:

$$\gamma_{\text{terreno}} = 2,0 \text{ t/m}^3$$

$$\text{Coeficiente de empuje al reposo } K_r = 1 - \sin(\phi)$$

- 6.- Tren RENFE tipo A (coeficiente de impacto según IPF-75)
- 7.- Tren RENFE tipo B (coeficiente de impacto según IPF-75)

2) Según EC-1:

1.- Peso propio del marco

2.- Cargas permanentes

- Balasto

- Vías y traviesas

- Arquetas

- Hormigón de forma

3.- Empuje de relleno de tierras sobre hastiales

4.- Relleno superior de tierras

5.- Sobrecarga uniforme de 3 t/m<sup>2</sup>

Para acciones 3, 4 y 5:

$$\gamma_{\text{terreno}} = 2,0 \text{ t/m}^3$$

$$\text{Coeficiente de empuje al reposo } K_r = 1 - \sin(\phi)$$

6.- Tren UIC tipo SW2 (coeficiente de impacto según EC-1)

7.- Tren UIC tipo LM71 (coeficiente de impacto según EC-1)

### **5.3.- Modelización empleada.**

Para la comprobación del presente Paso Inferior se ha empleado un programa de cálculo matricial que permite realizar el cálculo integral de marcos de hormigón armado bajo seis hipótesis de carga distintas, formadas por distintas combinaciones de un total de ocho casos de carga, proporcionando los valores de los esfuerzos axiles, cortantes y flectores para cada hipótesis además de las armaduras de flexión y cortante necesarias en cada sección del marco.

El programa resuelve el cálculo de los esfuerzos en un marco de hormigón armado aplicando el método directo de la rigidez a una modelización plana de la estructura mediante barras que representan un metro de la profundidad del marco.

Para cada barra se proporcionan resultados en once puntos equidistantes a lo largo de la longitud de la misma.

El marco se considera apoyado sobre el terreno elástico cuya rigidez es directamente proporcional al coeficiente de balasto del suelo.

Las fuerzas de empotramiento que actúan sobre cada nudo se calculan aplicando la teoría de cálculo elástico de Euler-Bernoulli-Navier a una barra biempotrada sometida a las cargas contempladas en las distintas hipótesis.

#### **5.4.- Materiales y coeficientes de cálculo.**

De acuerdo con los niveles de control de calidad definidos, se adoptan los siguientes coeficientes de seguridad:

- Estados límites últimos:

1.- Elementos prefabricados:

a) Coeficientes de minoración de resistencias:

- Acero pasivo (B-500-S):  $\gamma_s = 1,10$

- Hormigón (H-300):  $\gamma_c = 1,40$

b) Coeficientes de ponderación de acciones:  $\gamma_f = 1,50$

2.- Obra in situ:

a) Coeficientes de minoración de resistencias:

- Acero pasivo (B-500-S):  $\gamma_s = 1,15$

- Hormigón (H-250):  $\gamma_c = 1,50$

b) Coeficientes de ponderación de acciones:  $\gamma_f = 1,60$

#### **5.5.- Evaluación de la situación estructural.**

El cálculo de la estructura es correcto y acorde a la normativa vigente en el momento de su cálculo.

## **6.- PLAN DE PRUEBAS.**

No se tiene constancia de que, con anterioridad a la de este informe, se efectuara otra prueba de carga con camiones con objeto de realizar una recepción provisional de la obra y un primer análisis de la respuesta de la estructura frente a acciones estáticas y dinámicas, cuando la vía no estaba colocada.

La prueba de carga de la que es objeto el presente informe se realizó, por el contrario, con trenes, según se comenta en los siguientes apartados, en los que se hablará de acciones reproducidas, puntos de medida y equipos utilizados.

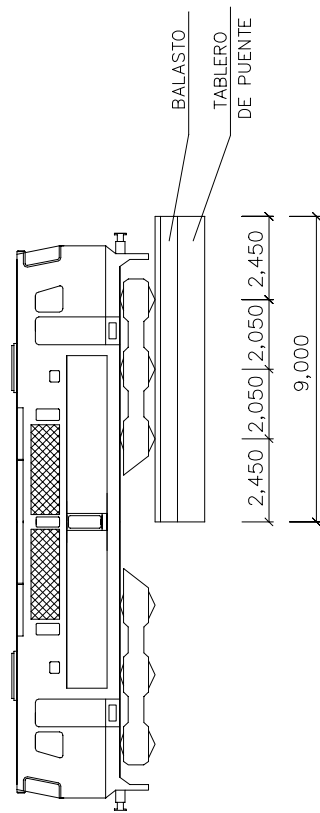
### ***6.1.-ACCIONES REPRODUCIDAS.***

La prueba de carga contempla tanto acciones estáticas como dinámicas, con el fin de reproducir en la misma todo el abanico de posibles solicitaciones a las que pueda estar sometido el puente a lo largo del tiempo.

El tren de cargas empleado consistió en una locomotora serie 060, estando su peso total en 120 t, repartido uniformemente entre sus respectivos ejes (seis por cada máquina) de 20 t.

Las acciones que se pretenden reproducir, como se ha indicado anteriormente, son aquellas propias de la utilización de la obra y consisten en una posición de carga estática y tres pruebas dinámicas a 5 km/h, 40 km/h y 80 km/h, así como una de frenado a 80 km/h.

Se incluye a continuación, un croquis de la disposición de los trenes de cargas para la prueba estática.



PASO INFERIOR TRAMO Va  
P.K. 513+360

POSICIÓN DE LOS TRENES DE CARGA  
SOBRE EL TABLERO

## **6.2.- PUNTOS DE MEDIDA.**

El programa de instrumentación que se define recoge todas aquellas secciones en las que se ha considerado necesario conocer las tensiones y deformaciones producidas por las cargas actuantes.

Los puntos de medida se sitúan en los elementos y secciones fundamentales del tablero que compone la obra. En el ANEJO 3 - Esquema de Instrumentación y Tren de Cargas, se señalan todos los puntos instrumentados, diferenciándolos según se trate de transductores de desplazamiento, galgas extensométricas o acelerómetros.

Con esta instrumentación se han buscado las medidas siguientes:

- Descensos verticales del tablero en distintos puntos a la mitad de su luz.
- Deformaciones en la cara inferior del tablero en puntos a mitad de la luz, y en dos puntos próximos a los hastiales.
- Aceleraciones del tablero al paso del tren de carga, mediante un acelerómetro.

Por lo tanto, como resumen, cabe señalar que se han dispuesto: cinco transductores para medida de desplazamientos verticales a mitad de la luz; cuatro galgas extensométricas para medida de deformaciones (dos a mitad de luz y dos junto a los hastiales), y un acelerómetro. El número total de puntos instrumentados en el puente es de 10.

### **6.3.- EQUIPOS UTILIZADOS.**

Para la realización de pruebas de carga, el conjunto de los equipos de campo embarcados en furgonetas laboratorio, utilizados por TIFSA para la toma de datos experimentales en cada puente ó estructura, está constituido por los elementos que se relacionan a continuación, pudiéndose ver detalle de los equipos utilizados en campo, así como de los medios auxiliares empleados en la instrumentación en las fotografías finales que se presentan.

Debemos indicar que todos los equipos que se relacionan se encuentran en periodo vigente de verificación y/o calibración.

Comenzando por los elementos sensores, se utilizan galgas extensométricas para medida de deformaciones unitarias, transductores de desplazamiento para flechas y corrimientos en apoyos y acelerómetros para obtención de acelerogramas, con las siguientes características:

- GALGAS EXTENSOMÉTRICAS (TML). Resistencia nominal 120 ohmios y factor de galga 2,13. Longitud activa de 3 y 6 mm en estructuras metálicas y de 30 a 120 mm. en estructuras de hormigón, para medida de deformaciones unitarias y, por lo tanto, de tensiones.
- TRANSDUCTORES DE DESPLAZAMIENTO (RDP Electronics, ACT2000/C – TIPO inductivo): Recorrido 100 mm. Resolución virtualmente infinita. Linealidad +/- 0,1%.
- TRANSDUCTORES DE DESPLAZAMIENTO (Penny & Giles L C P U – TIPO potenciométrico): Recorrido 50 y 100 mm. Resolución virtualmente infinita. Linealidad +/- 0,5%.
- TRANSDUCTORES DE DESPLAZAMIENTO (Penny & Giles HLP190 - TIPO potenciométrico): Recorridos 100 mm (SA1100/4k); 50 mm (SA150/2k) y 25 mm (SA125/1k). Resolución virtualmente infinita. Linealidad de 0.05 % para los de 100 y +/- 0,075% para el resto.

- TRANSDUCTORES DE DESPLAZAMIENTO (SAN-EI E08-D3-30 Y E08-D3-50 - TIPO extensométrico). Recorridos de 30 y 50 mm. Resolución virtualmente infinita. Linealidad +/- 0,2%.
- TRANSDUCTORES DE DESPLAZAMIENTO (APEK HLS 10 - TIPO extensométrico): Recorrido de 10 mm. Resolución virtualmente infinita. Linealidad +/- 0,05%.
- ACELEROMETROS PIEZORRESISTIVOS (SENSOTEC JTF-AG111): Rango 10/50 g, sensibilidad 10 mV/g, linealidad +/- 1% de F.S. Respuesta en frecuencia desde DC a 250 Hz. Alimentación a 2,5 V. (rms).
- ACELEROMETROS CAPACITIVOS (PCB PIEZOTRONICS 3701): Rango 20 g, sensibilidad 100 mV/g, linealidad +/- 1% de F.S. Respuesta en frecuencia DC a 500 Hz. Alimentación 5 A 30 VDC.

El sistema de medida continúa con los acondicionadores de señal, que realizan el tratamiento y amplificación de las señales obtenidas en los diferentes sensores, generando salidas normalizadas para su registro posterior. El equipamiento utilizado es el siguiente:

- ACONDICIONADORES DE SEÑAL (SAN-EI 6 M 47-8): Excitación del puente 2,5 V., 5 K Hz. Salida  $\pm 2V$ . Balanceo automático de puente. Relación señal ruido 50 dB (rms). Filtro pasabajos de tres polos. Corriente de alimentación 12 V. DC. Frecuencia de respuesta desde DC a 2 KHz. Realizan el acondicionamiento preciso para galgas extensométricas y transductores basados en extensometría.
- ACONDICIONADORES DE SEÑAL (SAN-EI AH 1108): Excitación del puente 2 V (rms), 5 K Hz. Salida +/- 5 V. Balanceo automático de puente. Relación señal ruido 58 dB (rms). Filtro pasabajos de tres polos. Alimentación AC/DC. Frecuencia de respuesta desde DC a 2 KHz. Acondicionamiento extensométrico.

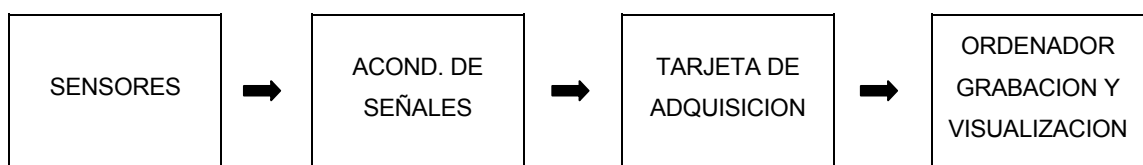
- ACONDICIONADORES DE SEÑAL (KINOSSEL KI5000): Linealidad 0,1%. Estabilidad mayor que  $0,05 \% ^\circ C^{-1}$ . Filtros 10, 100 y 1000 Hz. Balanceo automático. Salida +/- 5 V. Alimentación en AC/DC. Acondicionamiento potenciométrico.
- ACONDICIONADORES DE SEÑAL (RDP Electronics, modular 600): Rack multicanal con, 12 tarjetas bicanal. Alimentación en AC, excitación configurable hasta 15 V DC. Display 5 dígitos, selector individual de los 24 canales, exactitud 0.1% F.S., linealidad +/- 0.05% F.S. Implementación de 11 tarjetas 611, STRAIN GAUGE & DC/DC (transductores potenciométricos y de tipo general con electrónica incorporada y extensométricos, mediante doble electrónica): 10 Rangos de señal de entrada 5mV a 10V; Salida +/- 10 V.; Ganancia x0.5 a x2000; Balanceo manual; Frecuencia de respuesta desde DC a 200 Hz. Se complementa con 1 tarjeta 621, LVDT & INDUCTIVE TRANSDUCER (Transductores de tipo general LVDT): 8 rangos de señal 12 mV a 4 V; salida +/- 10 V; Ganancia x1 a x2000; Balanceo manual; Frecuencia de respuesta desde DC a 500 Hz. Flat. Temperatura de compensación en todos los canales inferior a 0.005 % FS/ $^\circ C$ .

Una vez realizado el tratamiento y amplificación de las señales obtenidas en los diferentes sensores, se realiza su control y registro mediante el siguiente equipamiento:

- ORDENADORES DE CONTROL:
  - Microprocesadores Pentium II/III a distintas velocidades. Bus PCI (5 Zoc. PCI, 3 ISA, Green PC)
  - Memoria RAM mínima de 64 Mb.
  - Unidad de disco flexible de 3 ½
  - Discos duro fijo primario superior 2 Gb. Controladora PCI-IDE.
  - Unidad CD-ROM 24X (Mín). Controladora PCI-IDE.
  - Monitor Super VGA COLOR. Tarjeta 2 Mb. PCI (1280-1024).
  - Disco secundario removible superior a 2,01 Gb. (PCI-IDE).

- Tarjeta de red.
- TARJETAS DE ADQUISICIÓN DE DATOS (National Instruments):
  - Multifunción de alta velocidad AT-MIO-64 F-5 (2 Ud), con 64 canales de entrada analógica simple o 32 diferenciales.
  - Velocidad máxima de muestreo de 200.000 muestras/seg.
  - 8 líneas digitales I/O y tres relojes contadores.
  - 2 canales de transferencia DMA.
  - Ganancia programable: 0.5, 1, 2, 5,10, 20, 50,100.
  - Convertidor A/D de 12 bits.
  - Ocupación de un Slot ISA en ordenador de control.
- TARJETAS DE ADQUISICIÓN DE DATOS (National Instruments):
  - Multifunción de alta velocidad AT-MIO-64 E-3 (1 Ud), con 64 canales de entrada analógica simple o 32 diferenciales.
  - Resto de características igual que las anteriores pero con una Velocidad máxima de muestreo de 300.000 muestras/seg.

Como síntesis del sistema conjunto se puede presentar el siguiente esquema funcional explicativo:



La señal producida en cada punto instrumentado, galga extensométrica, transductor de desplazamiento o acelerómetro, es filtrada y amplificada por los acondicionadores de señal.

La estabilidad de las medidas con galgas extensométricas a largo plazo está asegurada por la disposición de puentes de Wheatstone completos en cada punto de medida, evitando así la aparición de todo problema de deriva.

Las señales amplificadas, analógicas, son captadas por las tarjetas de adquisición de datos e introducidas en el ordenador de control, que realiza registro de las mismas, así como el tratamiento y presentación de datos para la visualización y seguimiento de las pruebas realizadas.

Comentar por último que durante las pruebas se efectúa el control continuo de las condiciones de temperatura y humedad ambientales.

El software de presentación de datos en campo permite la visualización de las medidas netas correspondientes a cada punto de medida en unidades físicas escaladas, numérica y gráficamente, siendo en tiempo real para las pruebas estáticas e inmediatamente tras su finalización en las de carácter dinámico.

En gabinete, una vez recopilados los registros de calidad de los ensayos, se comprueban sobre los formularios todos los datos, identificando los puntos de medida, los traductores empleados, las calibraciones, los parámetros de adquisición (frecuencia de muestreo y filtro), etc. Una vez realizado esto, en primer lugar las señales obtenidas mediante grabación digital en el ordenador de control son traducidas a magnitudes físicas y tiempos, y se prevvisualizan debidamente escaladas.

Posteriormente se hace el tratamiento y procesado completo hasta permitir dibujar en papel los registros escalados en coordenadas tiempo-magnitud para posibilitar su análisis e incorporación a los informes correspondientes.

Hay que señalar que se dispone de software específico para dicho tratamiento así como hojas de cálculo gráficas, tales como DADISP, o más generales como MATLAB.

Para tablas de presentación y como soporte informático de transmisión de resultados se utiliza un programa convencional con formato estándar de hoja de cálculo, por ejemplo como EXCEL.

En el caso de las medidas de aceleraciones se realiza además su estudio en frecuencias para la obtención de los modos fundamentales de vibración de la estructura, analizando los espectros obtenidos en cada prueba mediante la aplicación anterior.

Como equipos auxiliares se encuentran grupos electrógenos portátiles, 6.500 m de línea en bobinas de 25, 50 y 100 m de longitud, maquinaria portátil de limpieza, pulido y soldadura y pequeño herramental.

Hay que comentar que en el momento actual TIFSA dispone de la capacidad de hacer funcionar simultáneamente tres equipos de grabación (incluido personal técnico) con las tarjetas de adquisición anteriormente mencionadas, junto con un total de canales de 96, distribuidos entre 56 extensométricos, 16 potenciométricos y 22 mixtos.

El número total de transductores disponibles es de 78, de los cuales 64 son de desplazamiento (10, 25, 30, 50 y 100 mm), y 14 de aceleración (10, 20 y 50 Gs). Con ello la posibilidad de acometer pruebas de carga “especiales” por elevado número de puntos, o pruebas habituales simultáneas, vendrá en general limitada por la disponibilidad de trenes de ensayo en lugar de por el equipamiento disponible.

En las diversas fotografías incluidas en el ANEJO 5 - Reportaje Fotográfico, del presente informe pueden observarse los equipos utilizados en campo y la disposición de bandas extensométricas y transductores de desplazamiento en distintos puntos del puente ensayado.

#### **6.4.- RESULTADOS PREVISTOS.**

En el ANEJO 2 - Proyecto de Prueba de Carga, figura la relación de las flechas y microdeformaciones que cabe esperar durante los ensayos estáticos, así como la estimación de la frecuencia fundamental de oscilación de la estructura.

A continuación se expone el resumen de los valores calculados para las características de los materiales definidos en proyecto. Se muestran sólo los valores del cálculo resultantes de considerar un módulo de balasto de  $5 \text{ Kg/cm}^3$  que son los que más se ajustan a los registros obtenidos en los ensayos de carga.

| <b>PRUEBA ESTÁTICA</b>                           |                    |                 |
|--------------------------------------------------|--------------------|-----------------|
| <b>(LOCOMOTORA SERIE 060 EN AMBAS VÍAS)</b>      |                    |                 |
| <b>POSICIÓN</b>                                  | <b>FLECHA (mm)</b> | <b>DEF (μE)</b> |
| L / 2 (a 2 m del carril exterior de la vía der.) | -0,55              | -               |
| L / 2 (vía derecha, bajo carril exterior)        | -0,61              | -               |
| L / 2 (centro del tablero)                       | -0,64              | -               |
| L / 2 (vía izquierda, bajo carril exterior)      | -0,59              | -               |
| L / 2 (a 2 m del carril exterior de la vía izq.) | -0,52              | -               |
| L / 2 (vía derecha, bajo carril interior)        | -                  | 28              |
| L / 2 (vía izquierda, bajo carril interior)      | -                  | 28              |
| HASTIAL 1 (50 cm-vía izq., bajo carril int.)     | -                  | -6              |
| HASTIAL 2 (50 cm-vía der., bajo carril int.)     | -                  | -6              |

Los valores estimados para las frecuencias de oscilación correspondientes a los primeros modos de oscilación son los siguientes:

| <b>MODO</b> | <b>PERIODO (sg)</b> | <b>FRECUENCIA (Hz)</b> |
|-------------|---------------------|------------------------|
| 1           | 0,081               | 12,32                  |
| 2           | 0,067               | 15,00                  |
| 3           | 0,052               | 19,09                  |
| 4           | 0,027               | 37,73                  |
| 5           | 0,026               | 38,06                  |

## **7.- PRUEBA DE CARGA.**

Previamente a la ejecución de la prueba de carga, se realizaron los trabajos previos de instrumentación del puente de acuerdo con el programa ya fijado al que nos hemos referido en apartados anteriores.

Finalizada la instrumentación se procedió a la verificación de todas las conexiones, comprobación del perfecto funcionamiento de los equipos de amplificación y registro y, por último, prueba del conjunto completo de instrumentos mediante la grabación de las señales producidas por la calibración automática de los equipos.

### ***7.1.-DESCRIPCIÓN.***

La prueba de carga del puente se realizó el día 31 de julio de 2002 bajo la supervisión de D. Justo Carretero Pérez, Jefe de Instrumentación de la empresa TIFSA, adjudicataria de los trabajos, y de D. Ramiro Martínez-Llop Gutiérrez, como representante del GIF.

Los trenes de carga empleados consistieron en una locomotora serie 060, estando su peso total en 120 t, repartido uniformemente entre sus respectivos ejes (seis por cada máquina) de 20 t. El plan de pruebas se desarrolló según el siguiente esquema:

1. Prueba estática N°1 con los trenes de carga situados en ambas vías (ESTÁTICA 01) en la posición definida por el croquis contenido en el apartado 6.1.
2. Prueba dinámica a 5 km/h, también denominada cuasiestática con los trenes de carga circulando por ambas vías, (DINÁMICA 01).
3. Prueba dinámica a 5 km/h con uno de los trenes de cargas circulando por la vía 2 (DINÁMICA 21).
4. Prueba dinámica a 40 km/h con el tren de cargas circulando por la vía 2, (DINÁMICA 22).

5. Prueba dinámica a 80 km/h con el tren de cargas circulando por la vía 2, (DINÁMICA 23).
6. Prueba de frenado a 80 km/h con el tren de cargas circulando por la vía 2, (DINÁMICA 24).

Después de cada prueba dinámica se dejaba un tiempo mínimo de dos minutos para asegurar la recuperación total de la estructura y aprovechar para realizar un chequeo rápido de las medidas obtenidas, procediéndose antes y después a calibrar los aparatos de medida para obtener una perfecta correlación entre la señal producida y el fenómeno físico que la origina.

En las pruebas estáticas, el tiempo aproximado de puesta en carga de los tableros es de 12 minutos y el tiempo de grabación de la recuperación en torno a los 2 minutos. El tiempo total de grabación es del orden de 15 minutos.

Las pruebas, llevadas a cabo durante el día 31 de julio de 2002, comenzaron a las 15 h 03 min, finalizando a las 15 h 29 min, con una duración aproximada de 25 minutos. La temperatura medida durante la prueba fue de unos 25° C, mientras que la humedad se encontraba en torno al 40 %.

Por último, cabe señalar que al finalizar el ensayo se procedió a visualizar gráficamente los resultados para garantizar su correcta ejecución y comprobar si existía alguna anomalía en el funcionamiento resistente de la estructura.

## **7.2.- RESULTADOS OBTENIDOS.**

En el ANEJO 4 - Registro de Medidas, se adjuntan los gráficos correspondientes a todos los puntos de medida definidos de acuerdo con la numeración establecida en los planos de instrumentación.

Los resultados correspondientes a la prueba estática y cuasiestática con los dos trenes de carga circulando por ambas vías se agrupan en una primera hoja, las dos pruebas cuasiestáticas (la anterior y la correspondiente al tren de cargas circulando por la vía 2, respectivamente) se agrupan en una segunda hoja, mientras que las cuatro pruebas dinámicas correspondientes al paso de uno solo de los trenes de carga por la vía 2 se agrupan, a continuación, en la siguiente hoja. Todo esto se realiza de este modo para cada punto, habiéndose elegido este sistema de representación, al objeto de poder comparar mejor las medidas en cada una de las pruebas, facilitándose de esta forma la comprensión y el análisis comparativo entre los valores de cada una.

En cuanto a los registros de los acelerómetros se ha optado, también para su mejor comprensión, por agrupar en una primera página los resultados de las dos pruebas cuasiestáticas efectuadas, y en una segunda, las cuatro dinámicas con el tren circulando por la vía 2, colocando tras ellas el espectro de frecuencias que se obtiene en gabinete, como representativo del tablero, seleccionado de la prueba en la que se consigue mejor excitación, una vez estudiados el conjunto de registros mediante el análisis individual de cada uno de sus espectros de frecuencias. Las señales son grabadas en soporte digital e introducidas en un ordenador y una vez procesadas, se dibujan en coordenadas de tiempo y unidades del fenómeno físico medido.

En las tablas siguientes se recogen los valores medidos por los transductores de desplazamiento y las bandas extensométricas. En los ensayos dinámicos se recogen los valores máximos absolutos y en las pruebas estáticas aparecen los valores estabilizados. Los registros pueden consultarse en el ANEJO 4 - Registros de Medidas; mientras que en el ANEJO 3 - Esquema de Instrumentación y Tren de Cargas, se recoge un croquis con todos los puntos instrumentados.

### A) Resultados de las pruebas estáticas.

| Punto | Sección | UD | Valor Esper. | Valor Obten. | % Valor Alcanz. | Valor Reman. | % Valor Recup. |
|-------|---------|----|--------------|--------------|-----------------|--------------|----------------|
| P-11  | L/2     | mm | -0,55        | -0,23        | 41,8            | -0,03        | 87,0           |
| P-12  | L/2     | mm | -0,61        | -0,31        | 50,8            | -0,04        | 87,1           |
| P-13  | L/2     | mm | -0,64        | -0,29        | 45,3            | -0,03        | 89,7           |
| P-14  | L/2     | mm | -0,59        | -0,29        | 49,2            | -0,02        | 93,1           |
| P-15  | L/2     | mm | -0,52        | -0,24        | 46,2            | -0,02        | 91,7           |
| G-11  | L/2     | μE | 28           | 3,05         | 10,9            | -0,37        | >100,0         |
| G-12  | L/2     | μE | 28           | 3,91         | 14,0            | -0,05        | >100,0         |
| G-13  | Hastial | μE | -6           | -3,94        | 65,7            | -0,66        | 83,2           |
| G-14  | Hastial | μE | -6           | -3,35        | 55,8            | -0,27        | 91,9           |

Dentro de la columna de los valores esperados, se incluyen aquellos obtenidos del cálculo teórico, teniendo en cuenta el módulo de elasticidad estático. Se presenta una columna complementaria de porcentajes alcanzados respecto a los esperados. También se añaden los valores no recuperados (valores remanentes) medidos tras las pruebas así como los porcentajes finales de recuperación de flechas y deformaciones de bandas extensométricas.

### **B) Resultados de las pruebas dinámicas.**

En el siguiente cuadro se recogen los valores obtenidos durante las pruebas dinámicas, para los que se han tenido en cuenta, como se ha citado anteriormente los valores máximos.

#### **MEDIDAS EN ENSAYOS DINÁMICOS**

| Punto | Sección | UD | VALORES MÁXIMOS |       |       |       |       |
|-------|---------|----|-----------------|-------|-------|-------|-------|
|       |         |    | DIN01           | DIN21 | DIN22 | DIN23 | DIN24 |
| P-11  | L / 2   | mm | -0,19           | -0,01 | -0,02 | 0,02  | -0,03 |
| P-12  | L / 2   | mm | -0,25           | -0,05 | -0,07 | -0,07 | -0,05 |
| P-13  | L / 2   | mm | -0,27           | -0,06 | -0,07 | -0,07 | -0,06 |
| P-14  | L / 2   | mm | -0,28           | -0,06 | -0,07 | -0,07 | -0,06 |
| P-15  | L / 2   | mm | -0,19           | -0,17 | -0,17 | -0,18 | -0,16 |
| G-11  | L / 2   | μE | 3,82            | 1,75  | 2,04  | 1,83  | 1,93  |
| G-12  | L / 2   | μE | 4,20            | 1,50  | 1,55  | 1,35  | 1,54  |
| G-13  | Hastial | μE | -5,26           | -2,45 | -2,16 | -2,12 | -2,43 |
| G-14  | Hastial | μE | -3,35           | -1,98 | -1,88 | -1,94 | -1,82 |

Como se puede ver, las lecturas en la prueba cuasiestática con los trenes de carga circulando por ambas vías (DIN01) se obtienen valores del mismo orden que los de la prueba estática.

Tomando como referencia la prueba cuasiestática con el tren de cargas circulando por la vía 2 (DIN21) se obtienen los coeficientes de impacto a las distintas velocidades ensayadas. En este caso, y dado que se ha ensayado sólo la vía 2, los coeficientes de impacto se han calculado a partir de los valores medidos directamente de los puntos instrumentados bajo esa vía:

| COEFICIENTES DE IMPACTO |        |         |       |          |
|-------------------------|--------|---------|-------|----------|
| Punto                   | 5 km/h | 40 Km/h | 80K/h | F80 Km/h |
| P-11                    | 1,00   | -       | -     | -        |
| P-12                    | 1,00   | -       | -     | -        |
| P-13                    | 1,00   | 1,17    | 1,17  | 1,00     |
| P-14                    | 1,00   | 1,17    | 1,17  | 1,00     |
| P-15                    | 1,00   | 1,00    | 1,06  | 0,94     |
| G-11                    | 1,00   | -       | -     | -        |
| G-12                    | 1,00   | 1,03    | 0,90  | 1,03     |
| G-13                    | 1,00   | -       | -     | -        |
| G-14                    | 1,00   | 0,95    | 0,98  | 0,92     |

### **B) Frecuencia propia de vibración.**

Los valores estimados para las frecuencias de oscilación correspondientes a los tres primeros modos de oscilación son: 12,31; 15,00; 19,09 Hz obtenidas éstas en función del módulo de elasticidad estático del hormigón. La frecuencia obtenida del espectro del acelerómetro arroja, para la de mayor amplitud, un valor de 28,14 Hz (punto A11). En este espectro, podemos apreciar que el valor de la frecuencia es superior a la obtenida teóricamente para el primer modo de vibración de la estructura.

La zona temporal de análisis se corresponde con la de vibración residual libre de la estructura, una vez abandonada ésta por el tren de cargas y tomando siempre la parte final de la señal del acelerómetro.

Respecto al amortiguamiento de la estructura, señalar que se calculan en el mismo periodo temporal en el que se obtienen los espectros ya comentados para cálculo de las frecuencias. Se calculan directamente por el software utilizado para cálculo del espectro utilizando el método del ancho de banda. El valor deducido es de 1,40 %, para el punto A11, valor reducido para este tipo de estructuras.

Indicamos que los valores de amplitud que aparecen en los gráficos de los espectros, no tienen un significado físico o ingenieril, ya que corresponden solamente a los coeficientes de peso de los términos del desarrollo en serie de Fourier (FFT).

Los registros de las frecuencias propias de vibración son aceptables y coherentes con los menores valores obtenidos para flechas, que detectan una mayor rigidez en los tableros que la contemplada de forma teórica en los cálculos.

## **8.- ANÁLISIS DE LOS RESULTADOS.**

A la vista de los resultados obtenidos en la prueba de carga llevada a cabo, podemos realizar el siguiente análisis.

### **8.1.- PRUEBA ESTÁTICA.**

Las flechas obtenidas durante la prueba de carga son inferiores a los valores esperados. El porcentaje máximo obtenido en el tablero ha sido de 50,8 en el punto P-12. Los porcentajes de recuperación obtenidos son siempre correctos resultando superiores en todos los casos al 87 %.

La máxima flecha neta alcanzada, que coincide con la lectura de campo, ha sido 0,31 mm en el punto P-12 (carril exterior de la vía 1), lo que supone un valor respecto de la luz de cálculo de:

$$f_{\text{máx}} = 0,31 \text{ mm} \triangleleft L / 27419.$$

Todos los valores alcanzados, en lo referente a las flechas, son del orden de los habituales para este tipo de puentes y pueden considerarse correctos.

En cuanto a las deformaciones unitarias, los resultados obtenidos a la mitad de la luz son inferiores a los previstos según el modelo teórico, considerándose igualmente admisibles. Los porcentajes de recuperación de estos puntos han sido del 100,0 %.

Los valores de las deformaciones unitarias medidos junto a los hastiales han resultado, de igual modo, inferiores a los teóricos, siendo el máximo porcentaje alcanzado de 65,7 % (punto G-13). Las recuperaciones son también correctas y superiores al 83,0 %.

## **8.2.- PRUEBAS DINÁMICAS.**

El efecto dinámico que ha producido el paso del tren de cargas empleado circulando a 40 y 80 km/h, respecto de los valores obtenidos en la prueba cuasiestática con el tren de cargas tipo circulando por la vía 2 ha sido pequeño.

Definiendo el Coeficiente de Impacto como la relación entre las lecturas de cada punto a 40 y 80 km/h y la medida de la prueba cuasiestática se tienen los siguientes resultados para flechas y galgas:

El valor máximo para el coeficiente de impacto a 40 km/h en flechas es 1,17 alcanzándose en los puntos P-13 y P-14 instrumentados en el centro del tablero.

El valor máximo con el tren de cargas tipo circulando a 80 km/h que se obtiene para el coeficiente de impacto es, como en el caso anterior, 1,17 en los puntos P-13 y P-14.

Finalmente, el máximo coeficiente de impacto obtenido en la prueba de frenado a 80 km/h es la unidad, valor medido también en los puntos P-13 y P-14.

Los valores máximos de los coeficientes de impacto relativos a galgas fueron de 1,03 (punto G-12) en la prueba dinámica a 40 km/h, 0,98 (punto G-14) en la prueba dinámica a 80 km/h y 1,03 (punto G-12) en la prueba de frenado a 80 km/h, valores todos ellos muy próximos a la unidad.

Posteriormente, como resultado del análisis del espectro de frecuencia por el método del ancho eficaz de banda, se estiman los siguientes valores de decremento logarítmico y amortiguación. Asimismo se aplica de forma automatizada por el programa de dibujo de espectros, utilizando el método del Ancho de Banda, donde se sustituye la

excitación armónica de la estructura por la originada por el tren de cargas en la prueba analizada.

Estudiando las vibraciones residuales libres instrumentados, una vez abandonados éstos por el tren de cargas, se han obtenido valores medios del decremento logarítmico de 0,09 según el acelerómetro instrumentado en el punto A11. Se ha estimado un porcentaje medio de un 1,40 % en dicho acelerómetro, respecto del amortiguamiento crítico, siendo este un valor normal en este tipo de estructuras.

En los registros no se observa ningún comportamiento que pueda considerarse anormal desde el punto de vista de los fenómenos de amplificación dinámica.

## **9.- CONCLUSIONES Y RECOMENDACIONES.**

De acuerdo con lo expuesto en los apartados precedentes, podemos llegar a las siguientes conclusiones:

- a) Los valores máximos de las flechas alcanzadas en el centro del vano tanto en las pruebas dinámicas como en la estática han sido en todos los casos inferiores a los esperados de acuerdo con el Proyecto de Prueba de Carga, y por tanto admisibles. El porcentaje máximo obtenido respecto de los valores teóricos ha sido del 50,8 %.
- b) Las medidas registradas en las galgas del centro del tablero así como las correspondientes a las galgas instrumentadas cerca de los hastiales han resultado inferiores a los valores teóricos.
- c) Las recuperaciones en el caso de las flechas medidas fueron en todos los casos superiores al 87 %, mientras que en galgas se alcanzaron valores siempre por encima del 83 %. Todas ellas se realizaron de forma prácticamente instantánea por lo que puede considerarse que el comportamiento de la estructura ha sido elástico.
- d) Los valores de los coeficientes de impacto en flechas han sido cercanos a la unidad con máximos de 1,17, 1,17 y 1,00 en las pruebas a 40, 80 km/h y frenado, respectivamente. Estos valores se consideran admisibles. Los coeficientes de impacto calculados en galgas han dado como resultado máximos de 1,03, 0,98 y 1,03 para las pruebas dinámicas a 40 km/h, 80 km/h y la prueba de frenado, respectivamente, en todos los casos en torno a la unidad.
- e) La frecuencia propia de vibración obtenida de los datos de los ensayos es superior a la teórica, resultando estos registros aceptables y coherentes con los menores valores medidos para flechas, que detectan una mayor rigidez en el tablero que la contemplada de forma teórica en los cálculos.

- f) Las lecturas recogidas en la prueba cuasiestática con los trenes de carga tipo circulando por ambas vías al mismo tiempo (DIN-01) son del mismo orden que las medidas de la prueba estática con lo que se deduce que el comportamiento del tablero y las medidas de los puntos instrumentados son correctos.
- g) Durante la inspección preliminar y la inspección en la fecha de los ensayos no se detectaron daños que pudieran afectar a la capacidad portante de la estructura.

Por todos estos motivos puede considerarse que el comportamiento de la obra durante la realización de los ensayos de carga ha sido correcto.

Madrid, diciembre de 2002

EL JEFE DE INSTRUMENTACIÓN      INGENIERO AUTOR DEL INFORME

Fdo.: Justo Carretero Pérez

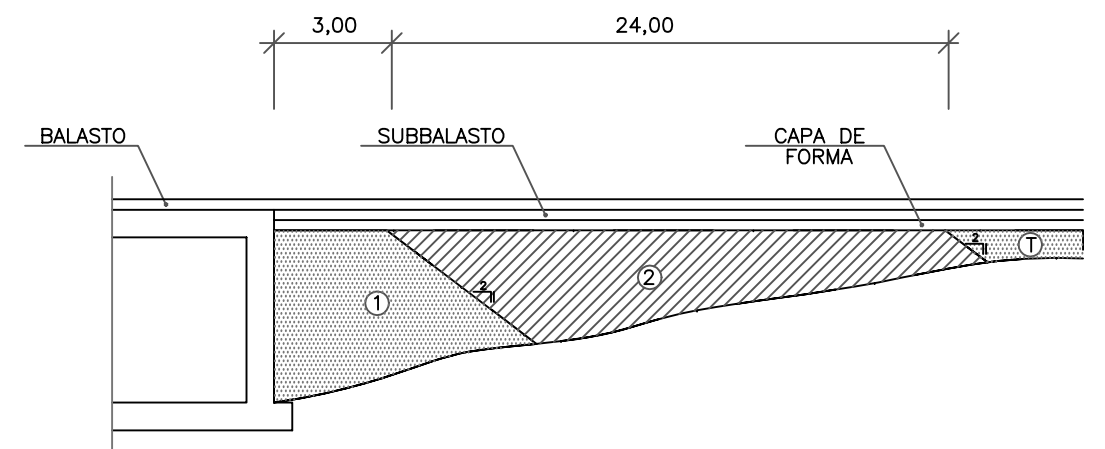
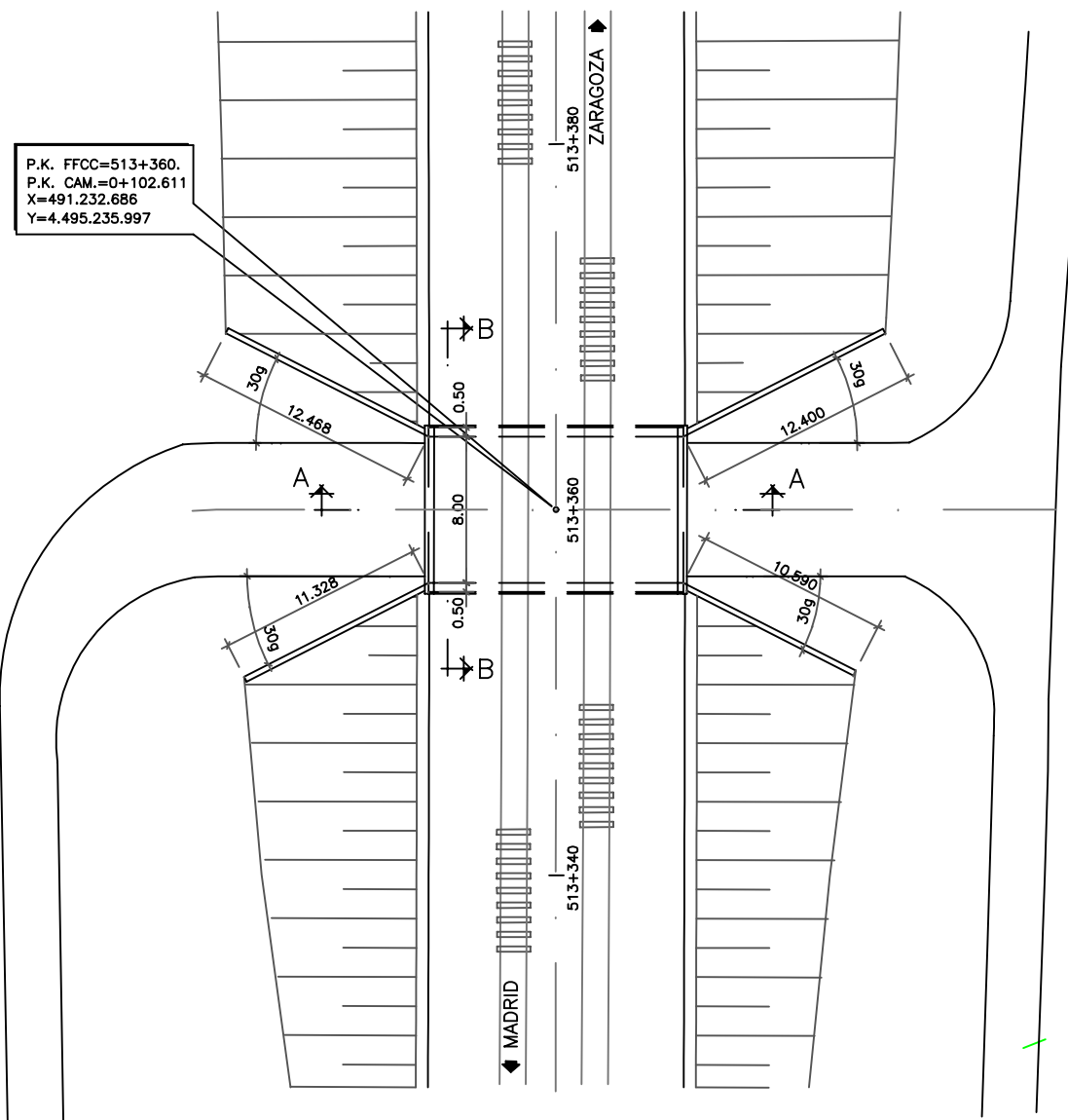
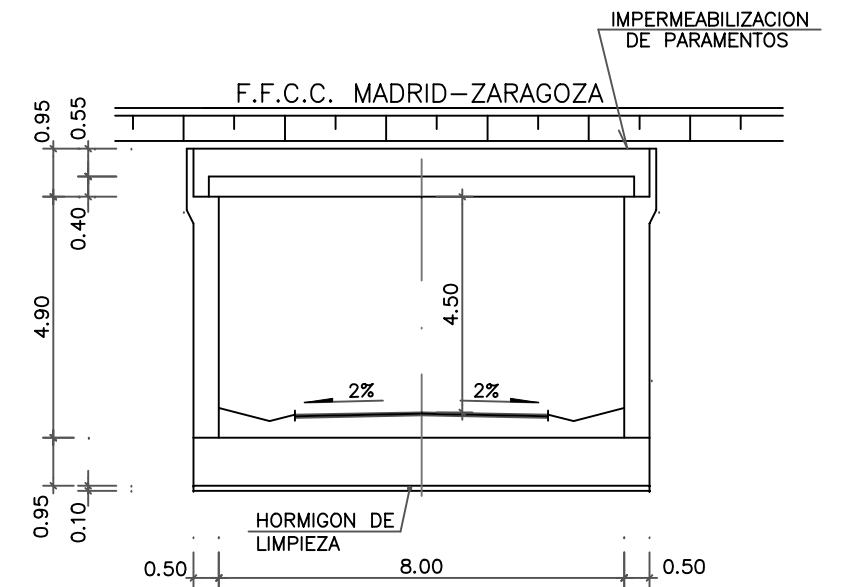
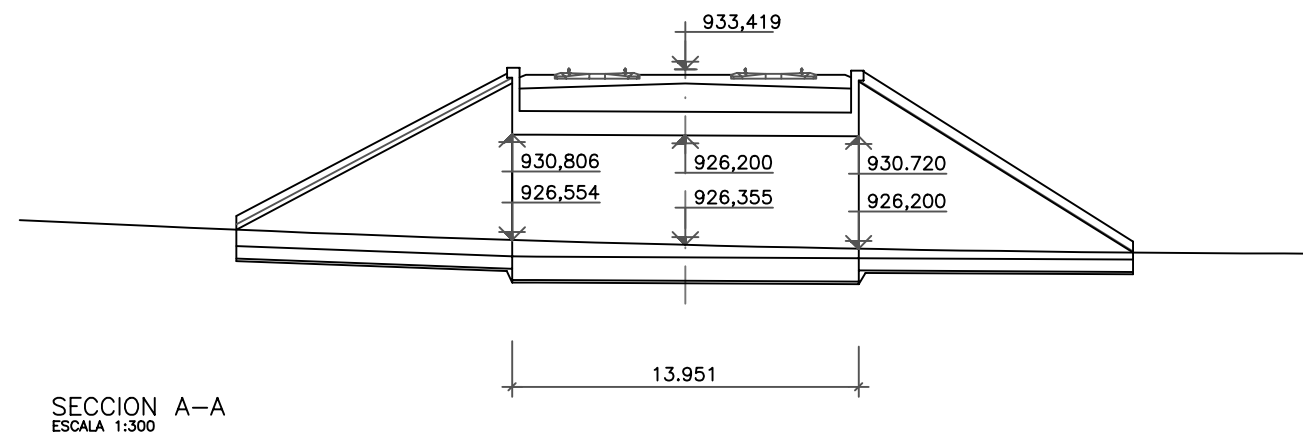
Fdo.: Daniel Cabello Moreno

EL DIRECTOR DE LA U.N.E. DE  
ESTRUCTURAS

Fdo.: Javier Cortezo García

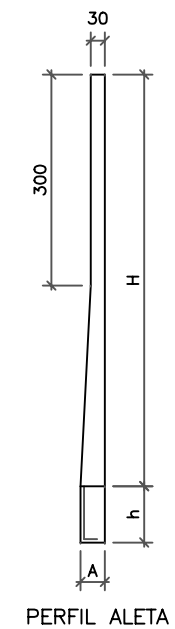
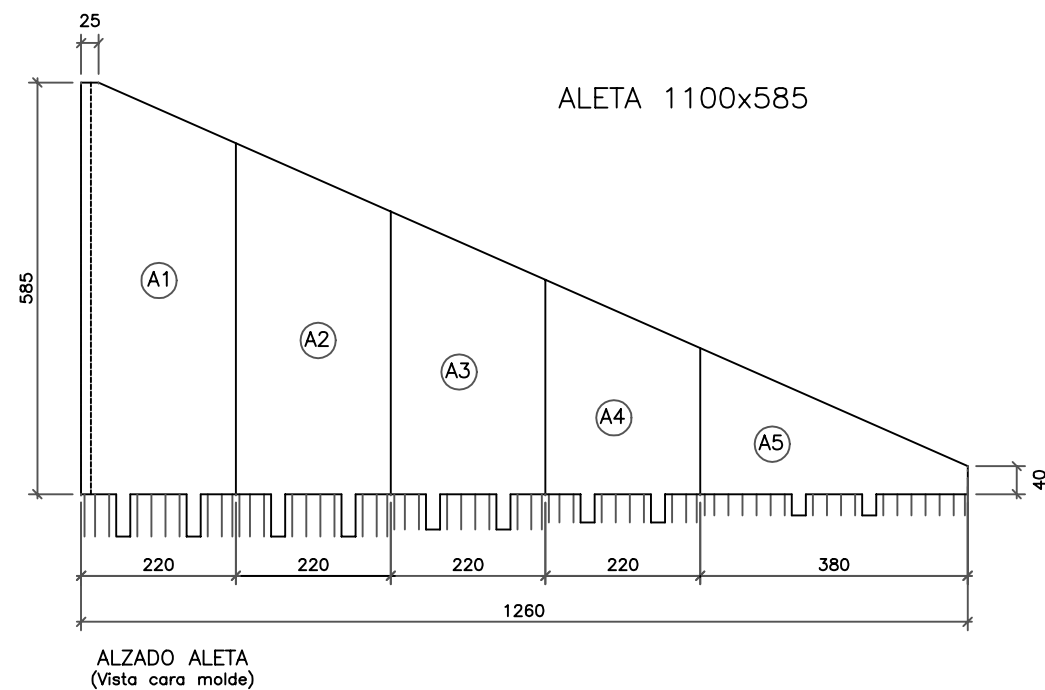
**ANEJO 1: DOCUMENTACIÓN FACILITADA POR EL GIF**

Madrid, Diciembre de 2002



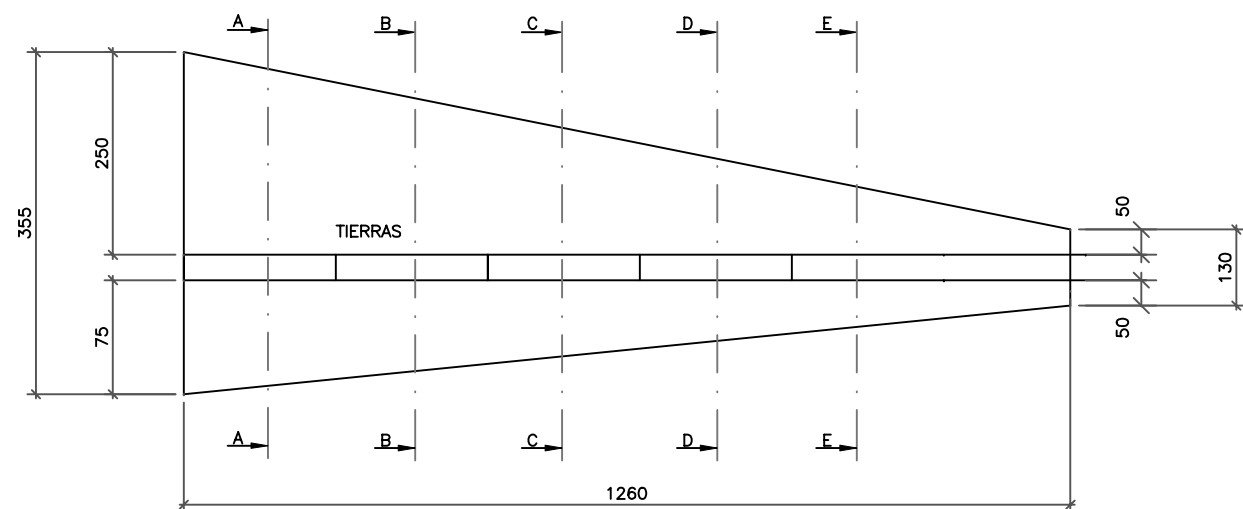
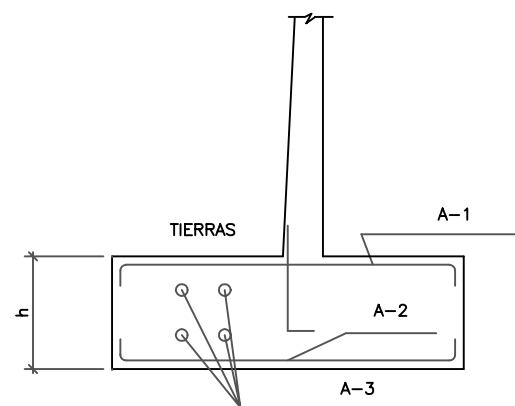
- ① SUELO ESTABILIZADO CON CEMENTO  $E_o > 16000 \text{ T/M}^2$
- ② ZAHORRAS COMPACTADAS  $E_o > 8000 \text{ T/M}^2$
- ① TERRAPLEN

$E_o$  = MODULO DE DEFORMACION EN 2º CICLO DE CARGA EN UN ENSAYO DE PLACA



| CONTROL DE CALIDAD |       |
|--------------------|-------|
| HORMIGON           | H-300 |
| ACERO              | B-500 |
| CONTROL INTENSO    |       |

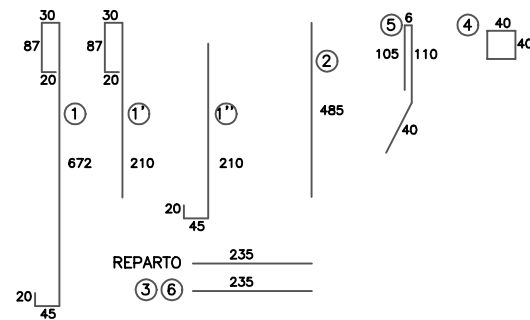
| ALETA | H   | A  | h  |
|-------|-----|----|----|
| A1    | 585 | 50 | 60 |
| A2    | 499 | 44 | 60 |
| A3    | 402 | 37 | 50 |
| A4    | 305 | 30 | 40 |
| A5    | 207 | 30 | 30 |



| CIMENTACION "IN SITU" |       |
|-----------------------|-------|
| HORMIGON              | H-200 |
| ACERO                 | B-500 |

| ARMADURA - CIMENTACIÓN |          |          |          |
|------------------------|----------|----------|----------|
| SECCION                | A-1      | A-2      | A-3      |
| A                      | Ø20 A 20 | Ø12 A 25 | Ø12 A 25 |
| B                      | Ø16 A 20 | Ø12 A 25 | Ø12 A 25 |
| C                      | Ø12 A 20 | Ø10 A 20 | Ø10 A 20 |
| D                      | Ø10 A 25 | Ø10 A 25 | Ø10 A 25 |
| E                      | Ø10 A 25 | Ø10 A 25 | Ø10 A 25 |

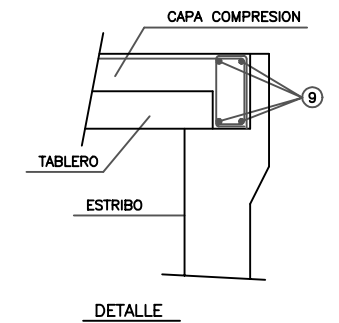
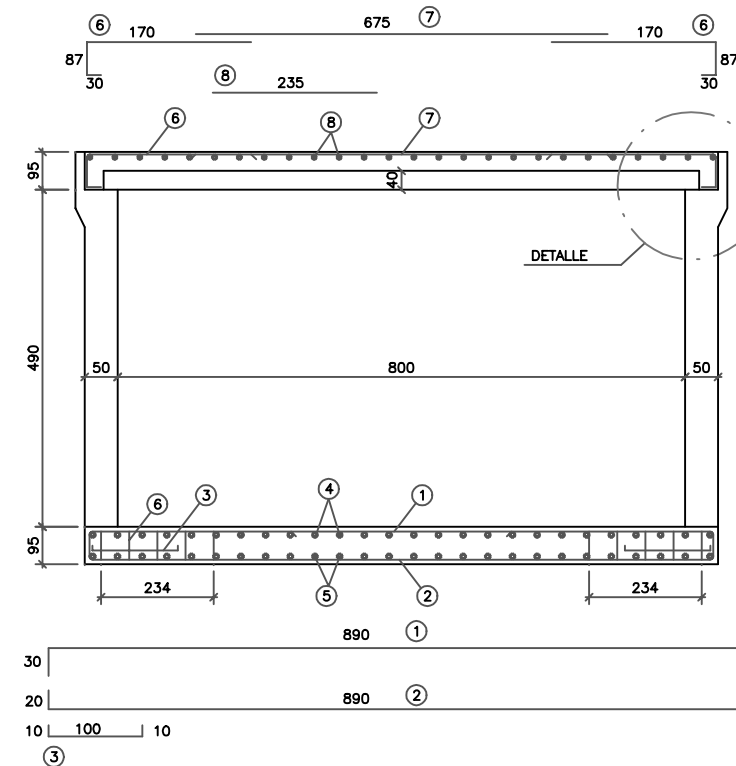
COTAS EN CM.



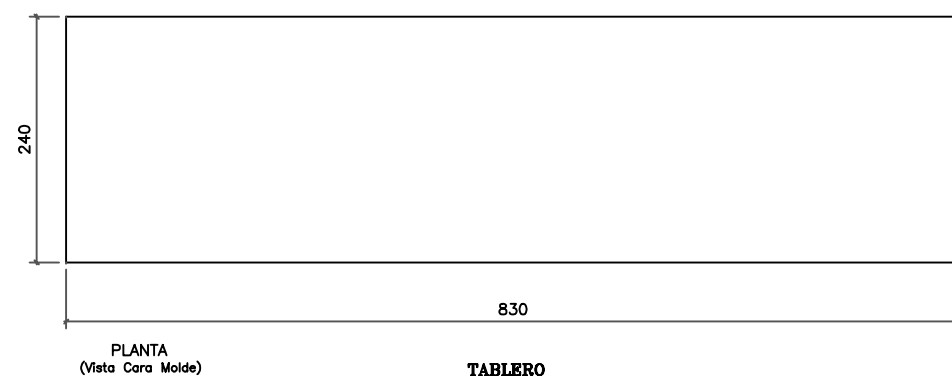
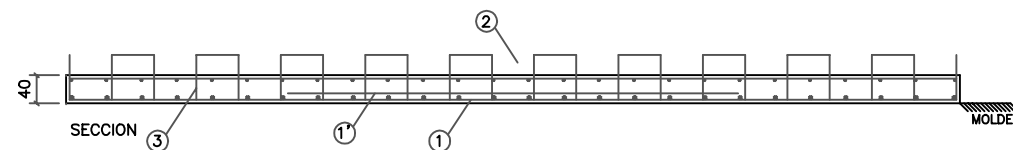
COTAS EN CM.

| CUADRO DE ARMADO |                                 |             |
|------------------|---------------------------------|-------------|
|                  | PRINCIPAL                       | REPARTO     |
| 1                | 9 Ø20                           | Ø12 /27 cm. |
| 1'               | 8 Ø20                           |             |
| 1"               | 4 Ø20+4 Ø16                     |             |
| 2                | 9 Ø12                           | Ø12 /27 cm. |
| 3                | 4 Ø16                           |             |
| 4                | Ø6 /23 cm.                      |             |
| 5                | Ø6 /17 cm.                      |             |
| 6                | 13 Ø6                           |             |
| PATAS            | 4 Ø10 (125)<br>Est. Ø 6 /17 cm. |             |

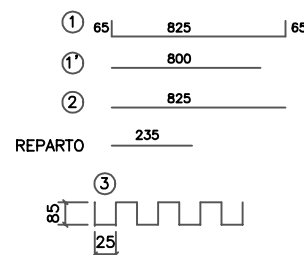
RECUBRIMIENTO: 25 mm.



**PASO 800x490**



**TABLERO  
830x240x40**



| CONTROL DE CALIDAD |       |
|--------------------|-------|
| HORMIGON           | H-300 |
| ACERO              | B-500 |

| CUADRO DE ARMADO |                                |                                |
|------------------|--------------------------------|--------------------------------|
|                  | PRINCIPAL                      | REPARTO                        |
| 1                | 14 Ø 32                        | Ø20 /25 cm. en 4 m. centrales. |
| 1'               | 5 Ø 32                         | Ø16 /25 cm. en extremos.       |
| 2                | 11 Ø 10                        | Ø 10 /25 cm.                   |
| 3                | 9 Ø8 /25cm en 250 cm extremos. |                                |
|                  | 9 Ø6 /25 cm en centro.         |                                |

RECUBRIMIENTO: 25 mm.

| CUADRO DE ARMADO |                 |
|------------------|-----------------|
| TIPO             | CAPA COMPRESION |
| 6                | Ø16 /17,5 cm.   |
| 7                | Ø16 /24 cm.     |
| 8                | Ø16 /24 cm.     |
| 9                | 4 Ø16           |

|                    |
|--------------------|
| CONTROL DE CALIDAD |
| HORMIGON: H-250    |
| ACERO: B-500       |
| CONTROL NORMAL     |

| CUADRO DE ARMADO |            |      |                 |
|------------------|------------|------|-----------------|
| TIPO             | SOLERA     | TIPO | SOLERA          |
| 1                | 8 ø25 /ml. | 4    | ø16 /26 cm.     |
| 2                | 4 ø16 /ml. | 5    | ø16 /30 cm      |
| 3                | 2 ø12 /ml. | 6    | 3 ø8 /26cm /ml. |

COTAS EN CM.

**ANEJO 2: PROYECTO DE PRUEBA DE CARGA**

Madrid, Diciembre de 2002

**CONTRATO DE CONSULTORÍA Y ASISTENCIA  
PARA LA REALIZACIÓN DE PRUEBAS DE CARGA  
PARA LA RECEPCIÓN DE PUENTES DE LA  
LÍNEA DE ALTA VELOCIDAD  
MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA.  
TRAMO: POZO DE GUADALAJARA-ALCOLEA DEL PINAR.  
BASE DE BRIHUEGA.**



**PROYECTO DE PRUEBA DE CARGA**

**SUBTRAMO V- $\alpha$   
P.I.  
06PI04**

## **ANEJO 2.- PROYECTO DE PRUEBA DE CARGA.**

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## **1.- INTRODUCCIÓN**

El presente documento tiene por objeto la especificación de la prueba de carga del **“PASO INFERIOR (P.K. 513/360) PERTENECIENTE AL SUBTRAMO Va DEL TRAMO MADRID-ZARAGOZA DE LA LÍNEA DE ALTA VELOCIDAD MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA”**.

Dicha prueba se efectúa con objeto de analizar la respuesta de la estructura frente a acciones estáticas y dinámicas, y previamente a su puesta en servicio, de acuerdo con la “Instrucción relativa a las acciones a considerar en el Proyecto de Puentes de Ferrocarril”.

## **2.- DATOS SOBRE LA ESTRUCTURA**

La estructura objeto de la Prueba de Carga forma parte de las obras de construcción del Subtramo Va pertenecientes al tramo Madrid – Zaragoza de la Línea de Alta Velocidad Madrid-Zaragoza-Barcelona-Frontera Francesa.

Se trata de un marco cerrado de hormigón armado de 9,00 m de longitud y una anchura de 13,951 m con una luz libre inferior de 8,00 m.

La estructura está compuesta por una losa inferior de 0,95 m de espesor hormigonada in situ sobre la que se montan los hastiales formados por paneles prefabricados de 0,50 m de espesor hasta completar la anchura del puente. La altura de coronación de los hastiales así formados es de 4,90 m sobre la losa inferior. La distancia entre sus ejes es de 8,50 m. prolongándose mediante aletas a ambos lados que forman 30° con el eje transversal del puente.

El tablero descansa sobre los hastiales y está formado por una capa inferior de piezas prefabricadas de hormigón armado de 0,40 m de espesor y una capa superior de compresión hormigonada in situ de 0,55 m de espesor alcanzando el canto total del tablero 0,95 m.

La documentación facilitada es el Proyecto Construido del Subtramo Va de la línea de Alta Velocidad Madrid-Zaragoza-Barcelona-Frontera Francesa. En el caso del Paso Inferior (06PI04) que nos ocupa, se dispone de los planos del proyecto construido correspondiente y del anejo de cálculo del tablero.

### **3.- JUSTIFICACIÓN DE LA CARGA DE PRUEBA**

Para la realización de la Prueba de Carga se ha solicitado al Peticionario la prestación de dos “locomotoras serie 060”. El peso total de las cargas situadas sobre el tablero durante las pruebas estáticas será de 60+60 t.

Las características de los trenes de carga en lo que a geometría y peso por eje se refiere vienen expresadas en el Anejo 2C, donde se acompañan además los croquis con la disposición de cargas sobre la estructura durante las pruebas estáticas.

Las Pruebas de Carga representan frente a las cargas de proyecto los porcentajes incluidos en las siguientes tablas:

a) Dos locomotoras serie 060 por ambas vías. Módulo de Balasto 1 Kg/cm<sup>3</sup>.

| <b>PARÁMETRO DE COMPARACIÓN</b> | <b>SOBRECARGA DE DISEÑO</b> | <b>CARGAS TOTALES</b> |
|---------------------------------|-----------------------------|-----------------------|
| M. FLECTOR POSITIVO             | 63%                         | 83%                   |
| M. FLECTOR NEGATIVO             | 62%                         | 81%                   |

b) Dos locomotoras serie 060 por ambas vías. Módulo de Balasto 5 Kg/cm<sup>3</sup>.

| <b>PARÁMETRO DE COMPARACIÓN</b> | <b>SOBRECARGA DE DISEÑO</b> | <b>CARGAS TOTALES</b> |
|---------------------------------|-----------------------------|-----------------------|
| M. FLECTOR POSITIVO             | 63%                         | 83%                   |
| M. FLECTOR NEGATIVO             | 62%                         | 81%                   |

El cálculo de los valores se encuentra en el Anejo 2B del presente documento.

#### **4.- MEDIDAS A REALIZAR**

A continuación se exponen las medidas que se realizarán durante los ensayos de prueba de carga, mediante la instrumentación que se detalla en el croquis del Anejo 2C del presente documento.

##### **4.1. FLECHAS**

Los desplazamientos medidos serán los verticales, en las posiciones definidas en el Anejo 2C del presente documento.

La medida de las flechas será realizada mediante transductores de desplazamientos para la medida de desplazamientos, registrándose dichas medidas, tanto durante las pruebas estáticas como durante las dinámicas.

##### **4.2. ACELERACIONES**

Durante las pruebas dinámicas, se procederá a un registro de las aceleraciones verticales con objeto de evaluar la frecuencia fundamental de oscilación de la estructura.

La medida de las aceleraciones verticales se realizará mediante un acelerómetro piezoeléctrico o piezorresistivo integrado en la cadena de medida.

##### **4.3. OTRAS MEDIDAS**

Se procederá a un registro continuo de temperatura y humedad relativa ambiente, durante la realización de los ensayos.

## **5.- PLAN DE CARGA Y PROGRAMACIÓN DEL ENSAYO**

### **5.1. PRUEBAS ESTÁTICAS**

Para cada prueba estática se posicionarán los trenes de cargas según las disposiciones indicadas en los croquis del Anejo 2C del presente documento.

Las medidas serán realizadas de acuerdo con los escalones siguientes:

- ESCALÓN 0: Puesta a cero de los aparatos.
- ESCALÓN 1: Situación de la carga.
- ESCALÓN 2: Estabilización de las medidas. Se realizarán medidas continuas hasta comprobar la estabilización de las mismas.
- ESCALÓN 3: Descarga total y medida de la recuperación. Las lecturas se realizarán de una forma continua hasta alcanzar una recuperación del 80% en un intervalo de tiempo no superior al de mantenimiento de la carga.

### **5.2. PRUEBAS DINÁMICAS**

Para las pruebas dinámicas se hará uso del tren de cargas formado por una locomotora de la serie 060 circulando por el puente a distintas velocidades:

- Ensayo Cuasiestático: Paso de la composición por la estructura circulando a la velocidad de 5 km/h (paso de hombre). Esta prueba se realizará dos veces, una con dos trenes de carga, uno por cada vía y otra por una sola vía con un único tren de carga.
- Ensayo Dinámico Lento: Paso de la composición del ensayo anterior circulando en el mismo sentido y a una velocidad intermedia entre 5 km/h y la máxima compatible con la seguridad del tren de cargas y de la estructura.

- Ensayo Dinámico Rápido: Paso de la composición circulando en el mismo sentido que en la prueba cuasi-estática y a la máxima velocidad compatible con la seguridad del tren de cargas y de la estructura.
- Ensayo de Frenado: Paso de la composición circulando a la máxima velocidad posible y frenado justo sobre la estructura.

Las pruebas se realizarán normalmente en el siguiente orden:

- ESTÁTICA
- CUASIESTÁTICA
- DINÁMICA LENTA
- DINÁMICA RÁPIDA
- FRENADO

## **6.- PREVISIÓN DE RESULTADOS**

En el Anejo 2B del presente documento figura la relación de las flechas que cabe esperar durante los ensayos estáticos, así como la estimación de la frecuencia fundamental de oscilación.

A continuación se expone el resumen de los valores calculados para las características de los materiales definidos en proyecto.

Como criterio de signo se adopta que los descensos verticales son negativos y las deformaciones de tracción son positivas.

**VALORES PARA UN MÓDULO DE BALASTO DE 1 Kg/cm<sup>3</sup>**

**ESTÁTICA N°1. (locomotoras 060 en ambas vías)**

| PUNTO | TRAMO | POSICION                                                   | UD. | PRUEBA | VALOR ESPERADO |
|-------|-------|------------------------------------------------------------|-----|--------|----------------|
| P-11  | 1     | L / 2 (a 2 metros del carril exterior de la vía Derecha)   | mm  | E-1    | -0,59          |
| P-12  | 1     | L / 2 (vía Derecha, bajo carril exterior)                  | mm  | E-1    | -0,65          |
| P-13  | 1     | L / 2 (centro del tablero)                                 | mm  | E-1    | -0,68          |
| P-14  | 1     | L / 2 (vía Izquierda, bajo carril exterior)                | mm  | E-1    | -0,64          |
| P-15  | 1     | L / 2 (a 2 metros del carril exterior de la vía Izquierda) | mm  | E-1    | -0,57          |
| G-11  | 1     | L / 2 (vía Derecha, bajo carril interior)                  | μE  | E-1    | 28             |
| G-12  | 1     | L / 2 (vía Izquierda, bajo carril interior)                | μE  | E-1    | 28             |
| G-13  | 1     | ESTRIBO 2 (50 cm-vía Der., bajo carril interior)           | μE  | E-1    | -6             |
| G-14  | 1     | ESTRIBO 1 (50 cm-vía Izq., bajo carril interior )          | μE  | E-1    | -6             |

El valor estimado para la frecuencia fundamental de flexión del tablero es de **7,74 Hz**.

**VALORES PARA UN MÓDULO DE BALASTO DE 5 Kg/cm<sup>3</sup>**

**ESTÁTICA N°1. (locomotoras 060 en ambas vías)**

| PUNTO | TRAMO | POSICION                                                   | UD. | PRUEBA | VALOR ESPERADO |
|-------|-------|------------------------------------------------------------|-----|--------|----------------|
| P-11  | 1     | L / 2 (a 2 metros del carril exterior de la vía Derecha)   | mm  | E-1    | -0,55          |
| P-12  | 1     | L / 2 (vía Derecha, bajo carril exterior)                  | mm  | E-1    | -0,61          |
| P-13  | 1     | L / 2 (centro del tablero)                                 | mm  | E-1    | -0,64          |
| P-14  | 1     | L / 2 (vía Izquierda, bajo carril exterior)                | mm  | E-1    | -0,59          |
| P-15  | 1     | L / 2 (a 2 metros del carril exterior de la vía Izquierda) | mm  | E-1    | -0,52          |
| G-11  | 1     | L / 2 (vía Derecha, bajo carril interior)                  | μE  | E-1    | 28             |
| G-12  | 1     | L / 2 (vía Izquierda, bajo carril interior)                | μE  | E-1    | 28             |
| G-13  | 1     | ESTRIBO 2 (50 cm-vía Der., bajo carril interior)           | μE  | E-1    | -6             |
| G-14  | 1     | ESTRIBO 1 (50 cm-vía Izq., bajo carril interior )          | μE  | E-1    | -6             |

El valor estimado para la frecuencia fundamental de flexión del tablero es de **12,32 Hz**.

Madrid, junio de 2002

EL JEFE DE INSTRUMENTACIÓN

INGENIERO AUTOR DEL  
PROYECTO

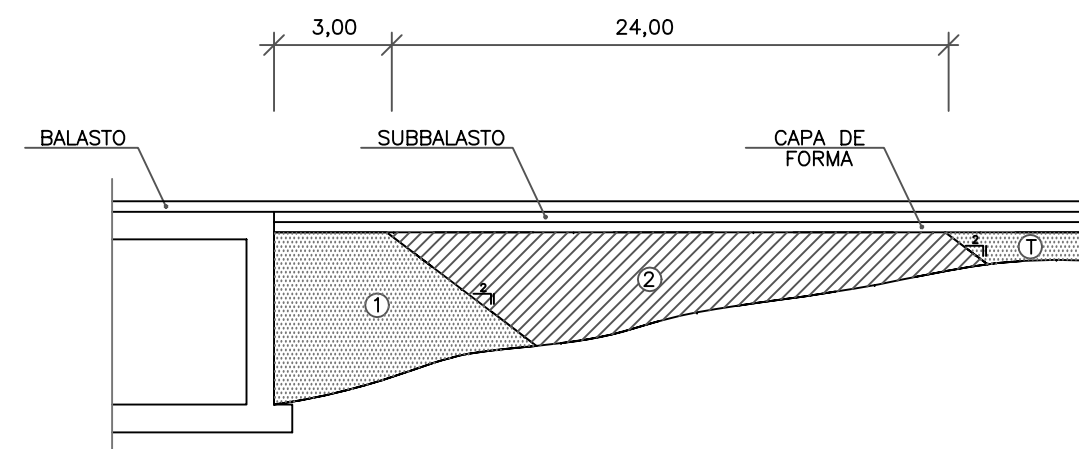
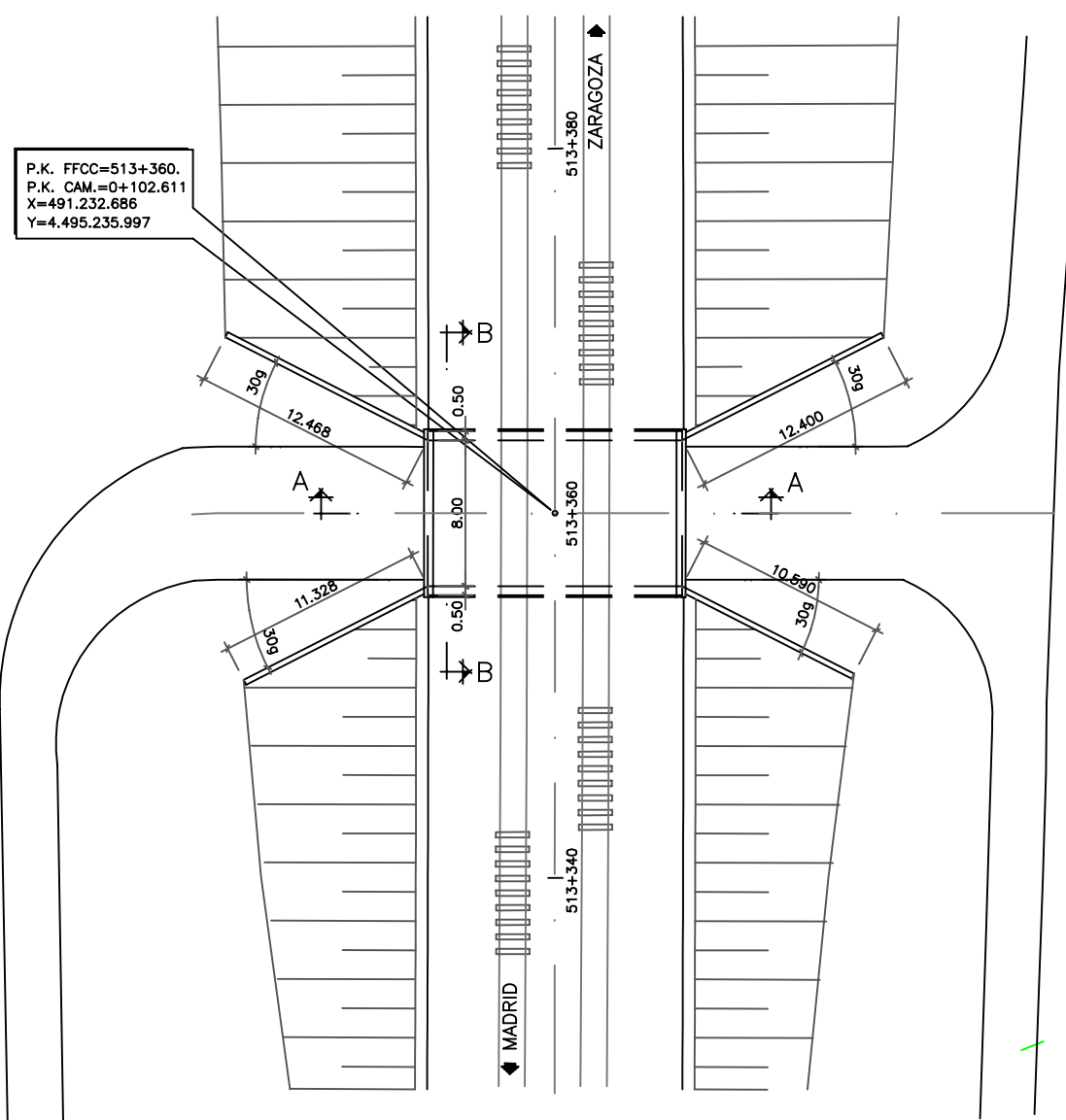
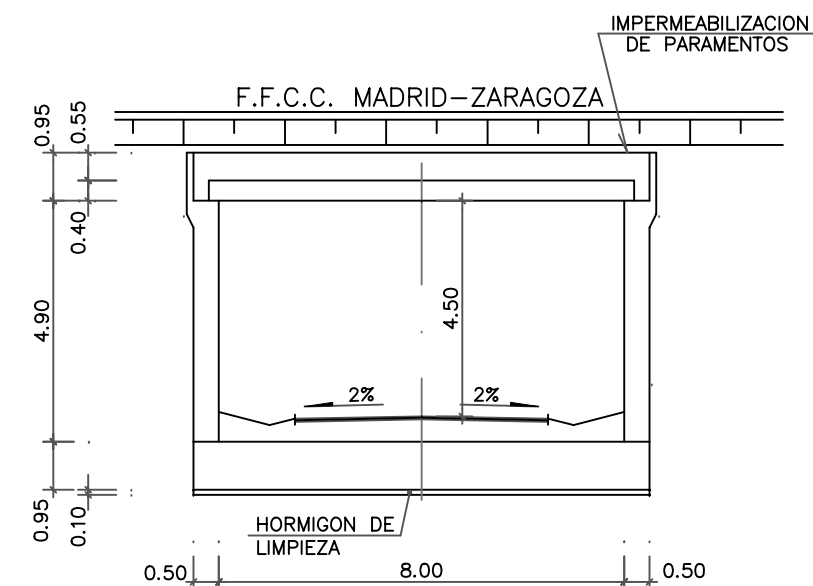
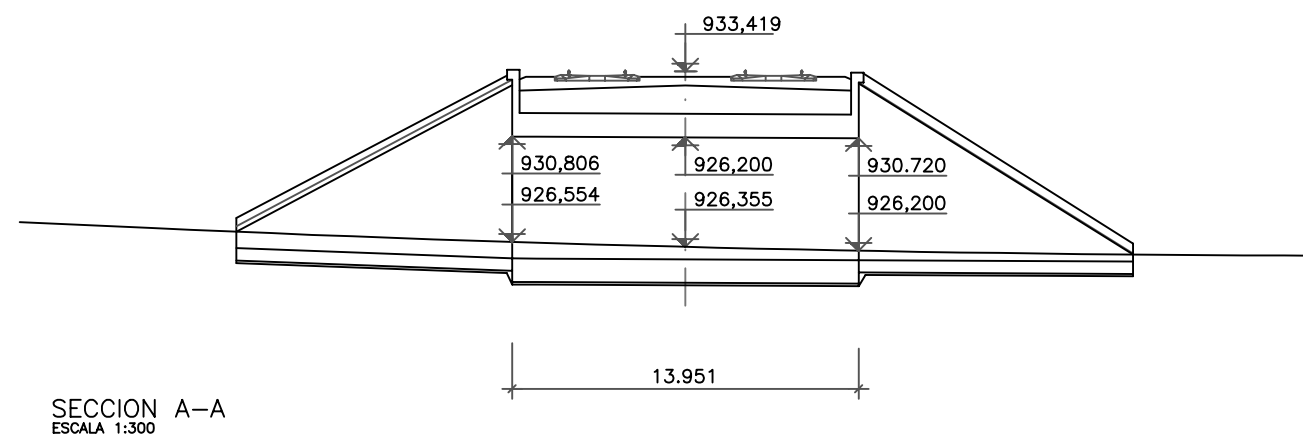
Fdo.: Justo Carretero Pérez

Fdo.: Daniel Cabello Moreno

EL DIRECTOR DE LA U.N.E. DE  
ESTRUCTURAS

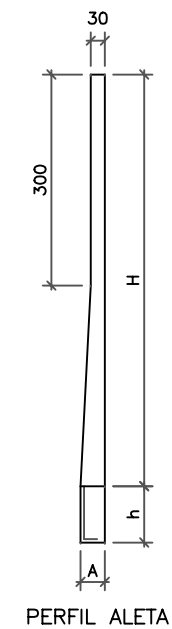
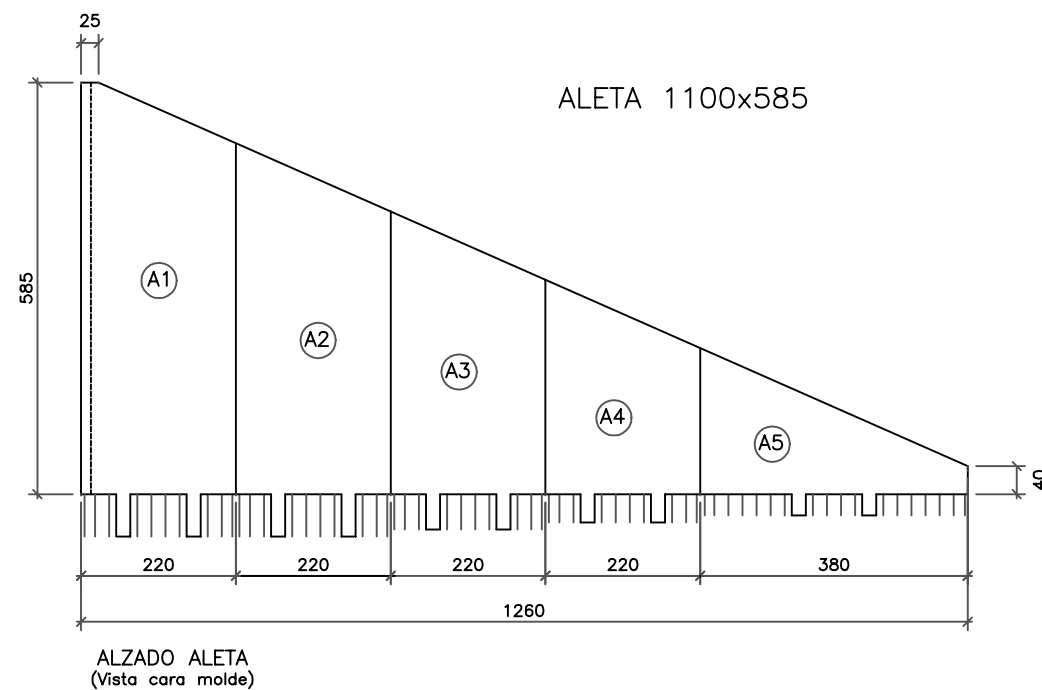
Fdo.: Javier Cortezo García

***ANEJO 2A: DOCUMENTACIÓN GRÁFICA UTILIZADA***



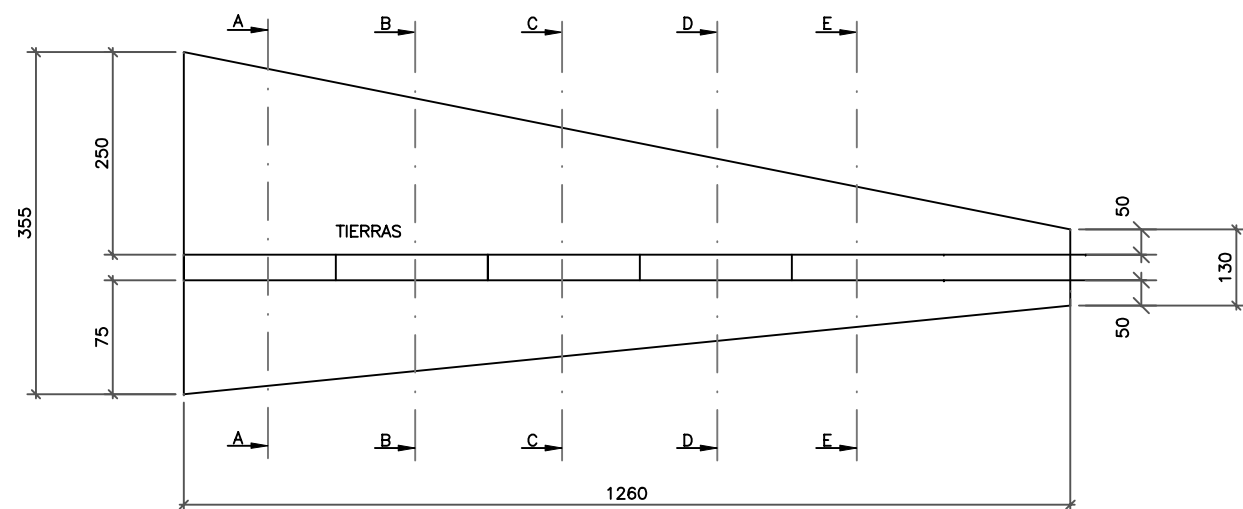
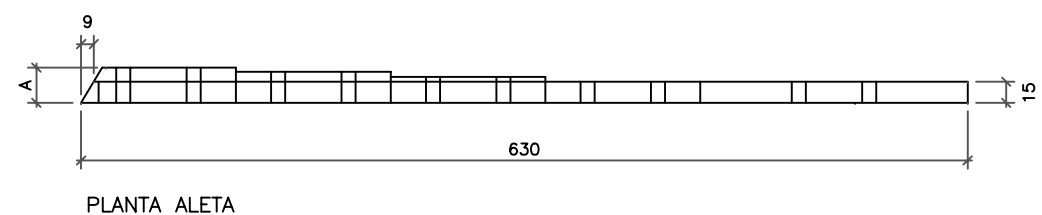
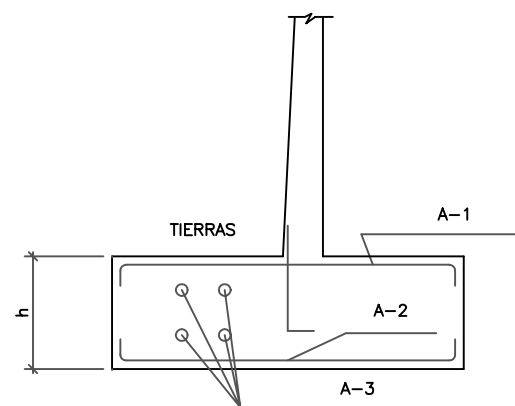
- ① SUELO ESTABILIZADO CON CEMENTO  $E_o > 16000 \text{ T/M}^2$
- ② ZAHORRAS COMPACTADAS  $E_o > 8000 \text{ T/M}^2$
- ① TERRAPLEN

$E_o$  = MODULO DE DEFORMACION EN 2º CICLO DE CARGA EN UN ENSAYO DE PLACA



| CONTROL DE CALIDAD |       |
|--------------------|-------|
| HORMIGON           | H-300 |
| ACERO              | B-500 |
| CONTROL INTENSO    |       |

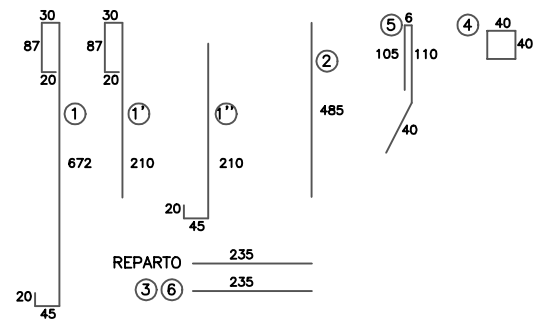
| ALETA | H   | A  | h  |
|-------|-----|----|----|
| A1    | 585 | 50 | 60 |
| A2    | 499 | 44 | 60 |
| A3    | 402 | 37 | 50 |
| A4    | 305 | 30 | 40 |
| A5    | 207 | 30 | 30 |



| CIMENTACION "IN SITU" |       |
|-----------------------|-------|
| HORMIGON              | H-200 |
| ACERO                 | B-500 |

| ARMADURA - CIMENTACIÓN |          |          |          |
|------------------------|----------|----------|----------|
| SECCION                | A-1      | A-2      | A-3      |
| A                      | Ø20 A 20 | Ø12 A 25 | Ø12 A 25 |
| B                      | Ø16 A 20 | Ø12 A 25 | Ø12 A 25 |
| C                      | Ø12 A 20 | Ø10 A 20 | Ø10 A 20 |
| D                      | Ø10 A 25 | Ø10 A 25 | Ø10 A 25 |
| E                      | Ø10 A 25 | Ø10 A 25 | Ø10 A 25 |

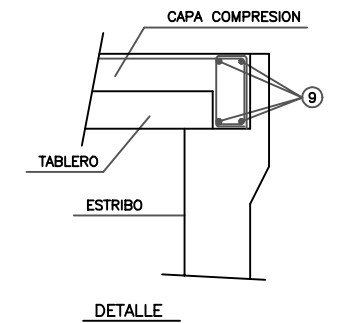
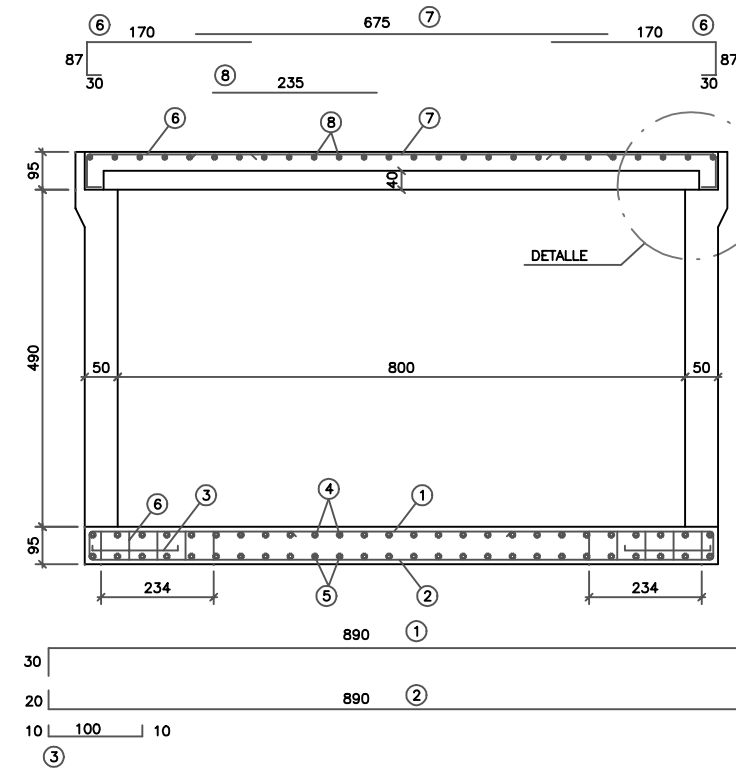
COTAS EN CM.



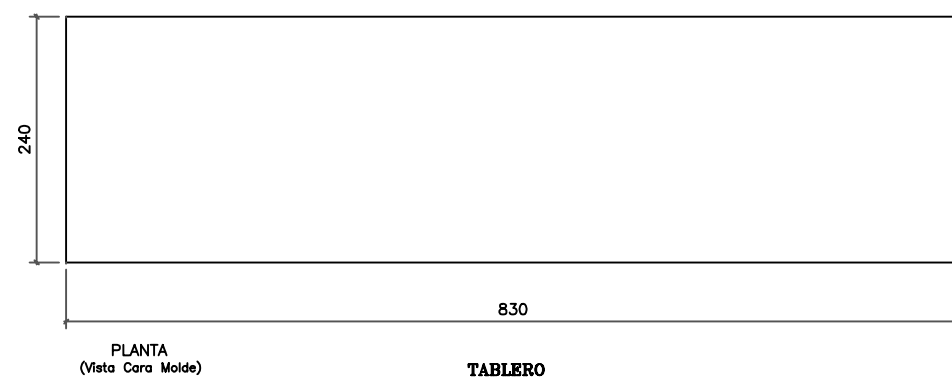
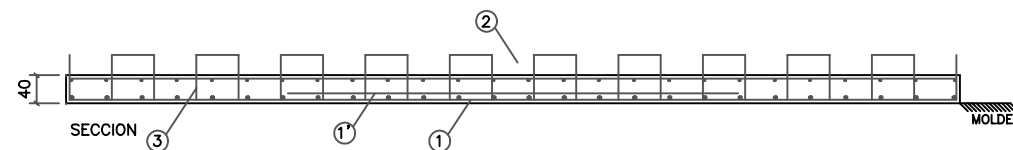
COTAS EN CM.

| CUADRO DE ARMADO |                  |             |
|------------------|------------------|-------------|
|                  | PRINCIPAL        | REPARTO     |
| 1                | 9 Ø20            | Ø12 /27 cm. |
| 1'               | 8 Ø20            |             |
| 1"               | 4 Ø20+4 Ø16      |             |
| 2                | 9 Ø12            | Ø12 /27 cm. |
| 3                | 4 Ø16            |             |
| 4                | Ø6 /23 cm.       |             |
| 5                | Ø6 /17 cm.       |             |
| 6                | 13 Ø6            |             |
| PATAS            | 4 Ø10 (125)      |             |
|                  | Est. Ø 6 /17 cm. |             |

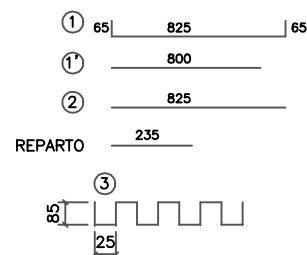
RECUBRIMIENTO: 25 mm.



**PASO 800x490**



**TABLERO  
830x240x40**



|                    |       |
|--------------------|-------|
| CONTROL DE CALIDAD |       |
| HORMIGON           | H-300 |
| ACERO              | B-500 |

| CUADRO DE ARMADO |             |                                |
|------------------|-------------|--------------------------------|
|                  | PRINCIPAL   | REPARTO                        |
| 1                | 14 ø 32     | ø20 /25 cm. en 4 m. centrales. |
| 1'               | 5 ø 32      | ø16 /25 cm. en extremos.       |
| 2                | 11 ø 10     | ø 10 /25 cm.                   |
| 3                | 9 ø8 /25cm  | en 250 cm extremos.            |
|                  | 9 ø6 /25 cm | en centro.                     |

RECUBRIMIENTO: 25 mm.

| CUADRO DE ARMADO |                 |
|------------------|-----------------|
| TIPO             | CAPA COMPRESION |
| 6                | Ø16 /17,5 cm.   |
| 7                | Ø16 /24 cm.     |
| 8                | Ø16 /24 cm.     |
| 9                | 4 Ø16           |

|                    |
|--------------------|
| CONTROL DE CALIDAD |
| HORMIGON: H-250    |
| ACERO: B-500       |
| CONTROL NORMAL     |

| CUADRO DE ARMADO |            |      |                 |
|------------------|------------|------|-----------------|
| TIPO             | SOLERA     | TIPO | SOLERA          |
| 1                | 8 ø25 /ml. | 4    | ø16 /26 cm.     |
| 2                | 4 ø16 /ml. | 5    | ø16 /30 cm      |
| 3                | 2 ø12 /ml. | 6    | 3 ø8 /26cm /ml. |

COTAS EN CM.

## ***ANEJO 2B: EVALUACIÓN DE FLECHAS***

# MODELO DE CÁLCULO

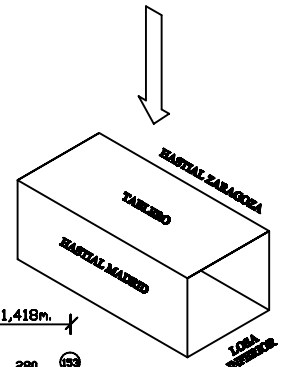
## HOJA 1 DE 2

### TABLERO

### HASTIAL ZARAGOZA

|   |     |    |     |         |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |          |     |         |     |     |     |     |
|---|-----|----|-----|---------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|---------|-----|-----|-----|-----|
|   |     |    |     | 1,618m. |     | 0,7760m. |     | 0,7760m. |     | 0,7760m. |     | 0,7760m. |     | 0,7760m. |     | 0,7760m. |     | 0,7760m. |     | 0,7760m. |     | 0,7760m. |     | 0,7760m. |     | 0,7760m. |     | 1,418m. |     |     |     |     |
| 9 | 265 | 19 | 266 | 27      | 267 | 36       | 268 | 45       | 269 | 54       | 270 | 63       | 271 | 72       | 81  | 273      | 90  | 274      | 99  | 275      | 108 | 276      | 117 | 277      | 126 | 278      | 135 | 279     | 144 | 280 | 153 |     |
| 8 |     | 16 | 24  | 32      | 40  | 48       | 56  | 64       | 72  | 80       | 88  | 96       | 104 | 112      | 120 | 128      | 136 |          |     |          |     |          |     |          |     |          |     |         |     |     |     |     |
| 8 | 249 | 17 | 250 | 26      | 251 | 35       | 252 | 44       | 253 | 53       | 254 | 62       | 255 | 71       | 256 | 80       | 257 | 89       | 258 | 98       | 259 | 107      | 260 | 116      | 261 | 125      | 262 | 134     | 263 | 143 | 264 | 152 |
| 7 |     | 15 | 23  | 31      | 39  | 47       | 55  | 63       | 71  | 79       | 87  | 95       | 103 | 111      | 119 | 127      | 135 |          |     |          |     |          |     |          |     |          |     |         |     |     |     |     |
| 7 | 233 | 16 | 234 | 25      | 235 | 34       | 236 | 43       | 237 | 52       | 238 | 61       | 239 | 70       | 240 | 79       | 241 | 88       | 242 | 97       | 243 | 106      | 244 | 115      | 245 | 124      | 246 | 133     | 247 | 142 | 248 | 151 |
| 6 |     | 14 | 22  | 30      | 38  | 46       | 54  | 62       | 70  | 78       | 86  | 94       | 102 | 110      | 118 | 126      | 134 |          |     |          |     |          |     |          |     |          |     |         |     |     |     |     |
| 6 | 217 | 15 | 218 | 24      | 219 | 33       | 220 | 42       | 221 | 51       | 222 | 60       | 223 | 69       | 224 | 78       | 225 | 87       | 226 | 96       | 227 | 105      | 228 | 114      | 229 | 123      | 230 | 132     | 231 | 141 | 232 | 150 |
| 5 |     | 13 | 21  | 29      | 37  | 45       | 53  | 61       | 69  | 77       | 85  | 93       | 101 | 109      | 117 | 125      | 133 |          |     |          |     |          |     |          |     |          |     |         |     |     |     |     |
| 5 | 201 | 14 | 202 | 23      | 203 | 32       | 204 | 41       | 205 | 50       | 206 | 59       | 207 | 68       | 208 | 77       | 209 | 86       | 210 | 95       | 211 | 104      | 212 | 113      | 213 | 122      | 214 | 131     | 215 | 140 | 216 | 149 |
| 4 |     | 12 | 20  | 28      | 36  | 44       | 52  | 60       | 68  | 76       | 84  | 92       | 100 | 108      | 116 | 124      | 132 |          |     |          |     |          |     |          |     |          |     |         |     |     |     |     |
| 4 | 185 | 13 | 186 | 22      | 187 | 31       | 188 | 40       | 189 | 49       | 190 | 58       | 191 | 67       | 192 | 76       | 193 | 85       | 194 | 94       | 195 | 103      | 196 | 112      | 197 | 121      | 198 | 130     | 199 | 148 | 200 | 147 |
| 3 |     | 11 | 19  | 27      | 35  | 43       | 51  | 59       | 67  | 75       | 83  | 91       | 99  | 107      | 115 | 123      | 131 |          |     |          |     |          |     |          |     |          |     |         |     |     |     |     |
| 3 | 169 | 12 | 170 | 21      | 171 | 30       | 172 | 39       | 173 | 48       | 174 | 57       | 175 | 66       | 176 | 75       | 177 | 84       | 178 | 93       | 179 | 102      | 180 | 111      | 181 | 120      | 182 | 129     | 183 | 138 | 184 | 145 |
| 2 |     | 10 | 18  | 26      | 34  | 42       | 50  | 58       | 66  | 74       | 82  | 90       | 98  | 106      | 114 | 122      | 130 |          |     |          |     |          |     |          |     |          |     |         |     |     |     |     |
| 2 | 153 | 11 | 154 | 20      | 155 | 29       | 156 | 38       | 157 | 47       | 158 | 56       | 159 | 65       | 160 | 74       | 161 | 83       | 162 | 92       | 163 | 101      | 164 | 110      | 165 | 119      | 166 | 128     | 167 | 137 | 168 | 146 |
| 1 |     | 9  | 17  | 25      | 33  | 41       | 49  | 57       | 65  | 73       | 81  | 89       | 97  | 105      | 113 | 121      | 129 |          |     |          |     |          |     |          |     |          |     |         |     |     |     |     |
| 1 | 137 | 10 | 138 | 19      | 139 | 28       | 140 | 37       | 141 | 46       | 142 | 55       | 143 | 64       | 144 | 73       | 145 | 82       | 146 | 91       | 147 | 100      | 148 | 109      | 149 | 118      | 150 | 127     | 151 | 136 | 149 | 152 |
|   |     |    |     |         |     |          |     |          |     |          |     |          |     | 13,90m.  |     |          |     |          |     |          |     |          |     |          |     |          |     |         |     |     |     |     |

### HASTIAL MADRID

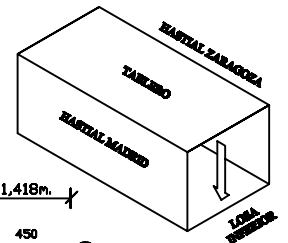


### LOSA INFERIOR

### HASTIAL ZARAGOZA

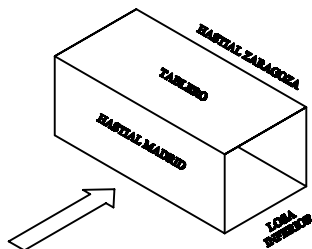
|     |     |         |         |         |         |         |         |         |         |         |         |         |     |
|-----|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----|
|     |     | 1,618m. | 1,552m. | 1,552m. | 1,552m. | 1,552m. | 1,552m. | 1,552m. | 1,552m. | 1,552m. | 1,552m. | 1,418m. |     |
| 480 | 438 | 439     | 440     | 441     | 442     | 443     | 444     | 445     | 446     | 447     | 448     | 449     | 450 |
| 482 | 490 | 498     | 506     | 514     | 522     | 530     | 538     | 546     | 554     |         |         |         |     |
| 481 | 609 | 610     | 611     | 612     | 613     | 614     | 615     | 616     | 617     |         |         |         |     |
| 481 | 489 | 497     | 505     | 513     | 521     | 529     | 537     | 545     | 553     |         |         |         |     |
| 480 | 600 | 601     | 602     | 603     | 604     | 605     | 606     | 607     | 608     |         |         |         |     |
| 480 | 488 | 496     | 504     | 512     | 520     | 528     | 536     | 544     | 552     |         |         |         |     |
| 479 | 591 | 592     | 593     | 594     | 595     | 596     | 597     | 598     | 599     |         |         |         |     |
| 479 | 487 | 495     | 503     | 511     | 519     | 527     | 535     | 543     | 551     |         |         |         |     |
| 478 | 582 | 583     | 584     | 585     | 586     | 587     | 588     | 589     | 590     |         |         |         |     |
| 478 | 486 | 494     | 502     | 510     | 518     | 526     | 534     | 542     | 550     |         |         |         |     |
| 477 | 573 | 574     | 575     | 576     | 577     | 578     | 579     | 580     | 581     |         |         |         |     |
| 477 | 485 | 493     | 501     | 509     | 517     | 525     | 533     | 541     | 549     |         |         |         |     |
| 476 | 564 | 565     | 566     | 567     | 568     | 569     | 570     | 571     | 572     |         |         |         |     |
| 476 | 484 | 492     | 500     | 508     | 516     | 524     | 532     | 540     | 548     |         |         |         |     |
| 475 | 555 | 556     | 557     | 558     | 559     | 560     | 561     | 562     | 563     |         |         |         |     |
| 475 | 483 | 491     | 499     | 507     | 515     | 523     | 531     | 539     | 547     |         |         |         |     |
|     | 341 | 342     | 343     | 344     | 345     | 346     | 347     | 348     | 349     | 350     | 351     | 352     | 353 |

### HASTIAL MADRID



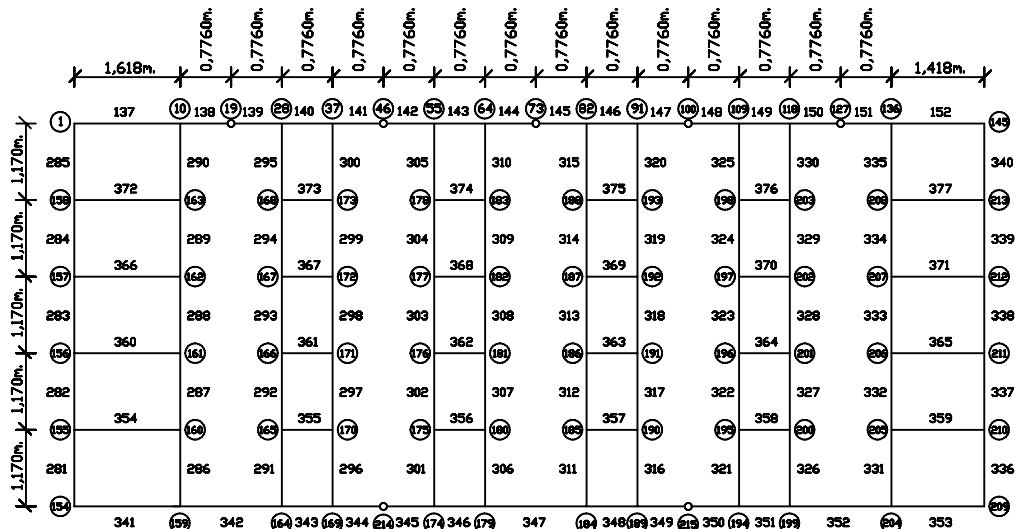
MODELO DE CÁLCULO

HOJA 2 DE 2

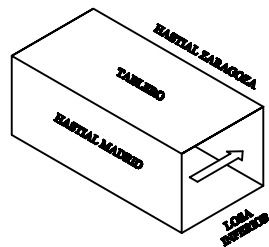


**HASTIAL MADRID**

**TABLERO**

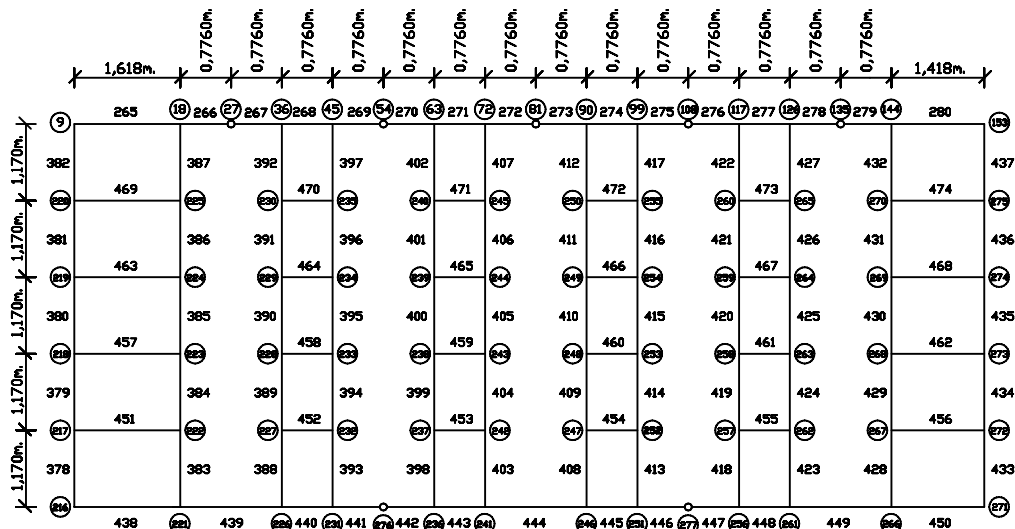


**LOSA INFERIOR**



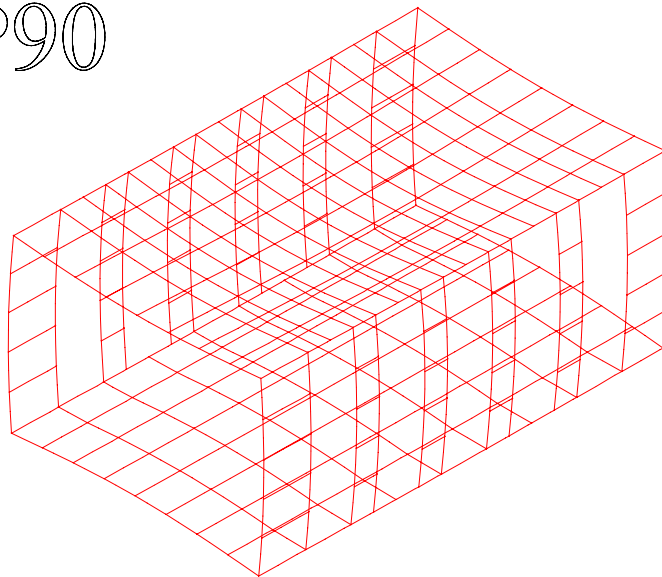
**HASTIAL ZARAGOZA**

**TABLERO**



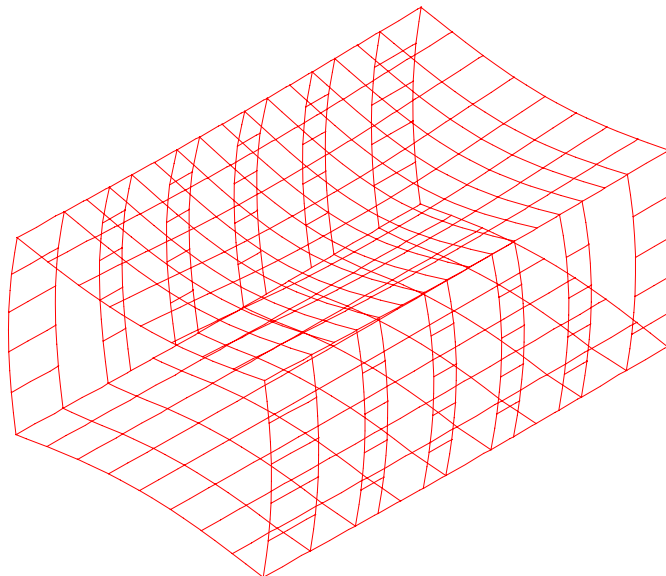
**LOSA INFERIOR**

# SAP90



**Flecha máxima vertical  
-1.620 mm**

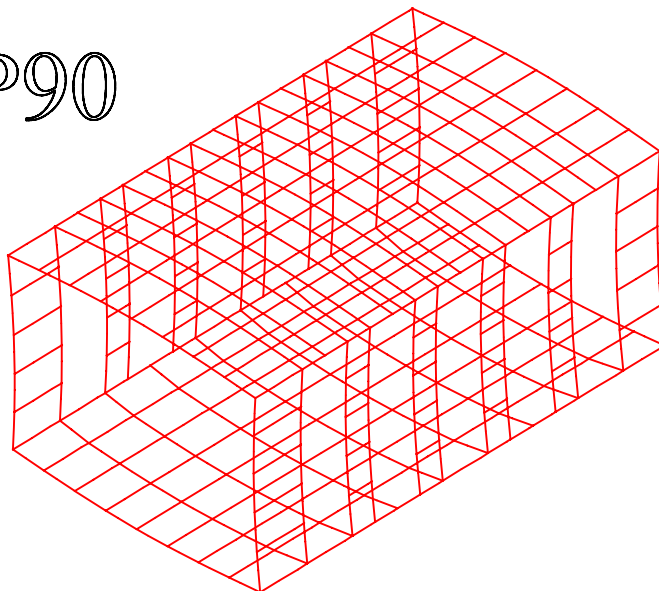
**1.1. Estática 1. Deformada producida por una locomotora serie 060 en el vano 1 por ambas vías  
Hipótesis con un módulo de balasto para el terreno de 0,001 t/cm<sup>3</sup>**



**Flecha máxima vertical  
-0.770 mm**

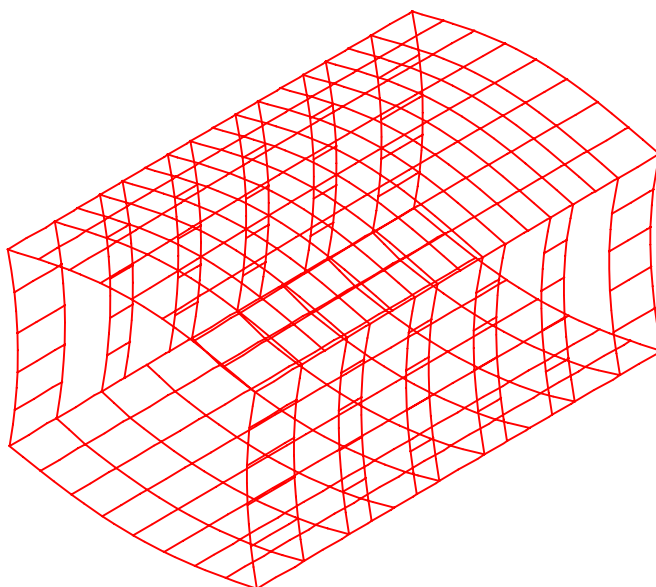
**1.2. Estática 1. Deformada producida por una locomotora serie 060 en el vano 1 por ambas vías  
Hipótesis con un módulo de balasto para el terreno de 0,005 t/cm<sup>3</sup>**

# SAP90



**Flecha máxima vertical**  
**19.880 mm**

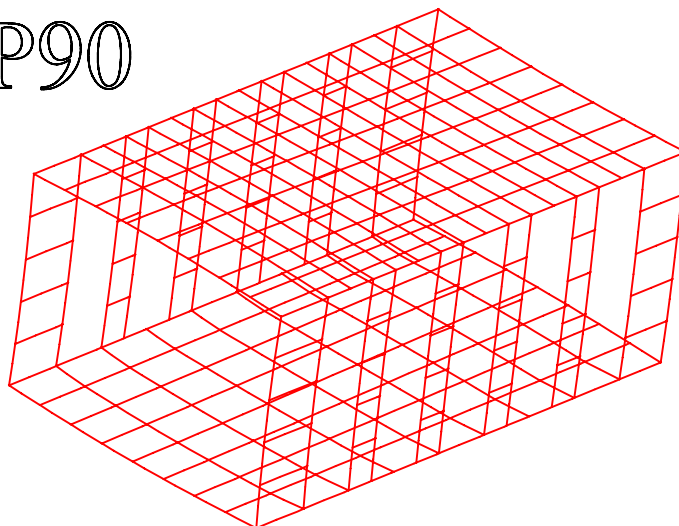
**1.1. Deformada del primer modo de vibración de la estructura**  
**Hipótesis con un módulo de balasto para el terreno de 0,001 t/cm<sup>2</sup>**



**Flecha máxima vertical**  
**20.020 mm**

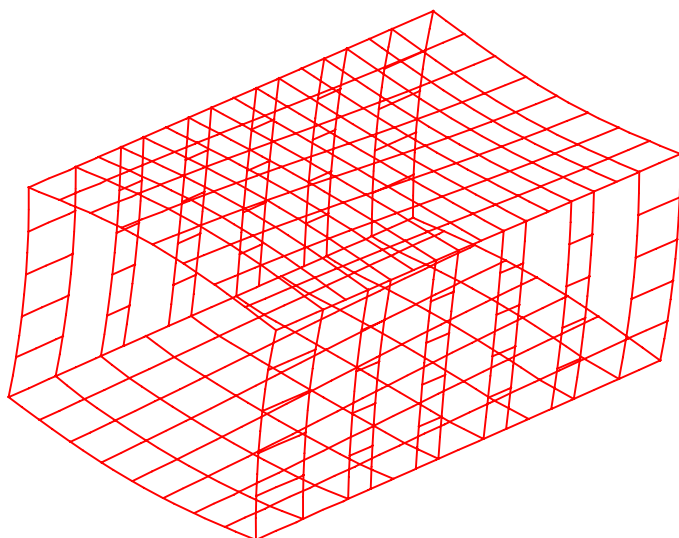
**1.2. Deformada del primer modo de vibración de la estructura**  
**Hipótesis con un módulo de balasto para el terreno de 0,005 t/cm<sup>2</sup>**

# SAP90



**Flecha máxima vertical**  
**-29.460 mm**

**1.1. Deformada del segundo modo de vibración de la estructura**  
**Hipótesis con un módulo de balasto para el terreno de 0,001 t/cm<sup>2</sup>**



**Flecha máxima vertical**  
**-32.150 mm**

**1.2. Deformada del segundo modo de vibración de la estructura**  
**Hipótesis con un módulo de balasto para el terreno de 0,005 t/cm<sup>2</sup>**

***HIPÓTESIS CON MÓDULO DE BALASTO PARA EL TERRENO IGUAL A  $1 \text{ kg/cm}^3$***

## Listado Input

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EDWARD L. WILSON  
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# S Y S T E M   D A T A

EXECUTION CODE - - - - - 0

NUMBER OF LOAD CONDITIONS - - - - - 3

STEADY STATE LOAD FREQUENCY - - - - - .0000E+00

NUMBER OF EIGENVALUES - - - - - 7

EIGEN CONVERGENCE TOLERANCE - - - - - .1000E-03

EIGEN CUTOFF TIME PERIOD - - - - - .0000E+00

## G E N E R A T E D   J O I N T   C O O R D I N A T E S

| JOINT | X       | Y       | Z       |
|-------|---------|---------|---------|
| 1     | .000    | .000    | 585.000 |
| 2     | .000    | 106.250 | 585.000 |
| 3     | .000    | 212.500 | 585.000 |
| 4     | .000    | 318.750 | 585.000 |
| 5     | .000    | 425.000 | 585.000 |
| 6     | .000    | 531.250 | 585.000 |
| 7     | .000    | 637.500 | 585.000 |
| 8     | .000    | 743.750 | 585.000 |
| 9     | .000    | 850.000 | 585.000 |
| 10    | 161.800 | .000    | 585.000 |
| 11    | 161.800 | 106.250 | 585.000 |
| 12    | 161.800 | 212.500 | 585.000 |
| 13    | 161.800 | 318.750 | 585.000 |
| 14    | 161.800 | 425.000 | 585.000 |
| 15    | 161.800 | 531.250 | 585.000 |
| 16    | 161.800 | 637.500 | 585.000 |
| 17    | 161.800 | 743.750 | 585.000 |
| 18    | 161.800 | 850.000 | 585.000 |
| 19    | 239.400 | .000    | 585.000 |
| 20    | 239.400 | 106.250 | 585.000 |
| 21    | 239.400 | 212.500 | 585.000 |
| 22    | 239.400 | 318.750 | 585.000 |
| 23    | 239.400 | 425.000 | 585.000 |
| 24    | 239.400 | 531.250 | 585.000 |
| 25    | 239.400 | 637.500 | 585.000 |
| 26    | 239.400 | 743.750 | 585.000 |
| 27    | 239.400 | 850.000 | 585.000 |
| 28    | 317.000 | .000    | 585.000 |
| 29    | 317.000 | 106.250 | 585.000 |
| 30    | 317.000 | 212.500 | 585.000 |
| 31    | 317.000 | 318.750 | 585.000 |
| 32    | 317.000 | 425.000 | 585.000 |
| 33    | 317.000 | 531.250 | 585.000 |
| 34    | 317.000 | 637.500 | 585.000 |
| 35    | 317.000 | 743.750 | 585.000 |
| 36    | 317.000 | 850.000 | 585.000 |
| 37    | 394.600 | .000    | 585.000 |
| 38    | 394.600 | 106.250 | 585.000 |
| 39    | 394.600 | 212.500 | 585.000 |
| 40    | 394.600 | 318.750 | 585.000 |
| 41    | 394.600 | 425.000 | 585.000 |
| 42    | 394.600 | 531.250 | 585.000 |
| 43    | 394.600 | 637.500 | 585.000 |
| 44    | 394.600 | 743.750 | 585.000 |
| 45    | 394.600 | 850.000 | 585.000 |
| 46    | 472.200 | .000    | 585.000 |
| 47    | 472.200 | 106.250 | 585.000 |
| 48    | 472.200 | 212.500 | 585.000 |
| 49    | 472.200 | 318.750 | 585.000 |
| 50    | 472.200 | 425.000 | 585.000 |
| 51    | 472.200 | 531.250 | 585.000 |
| 52    | 472.200 | 637.500 | 585.000 |
| 53    | 472.200 | 743.750 | 585.000 |
| 54    | 472.200 | 850.000 | 585.000 |
| 55    | 549.800 | .000    | 585.000 |
| 56    | 549.800 | 106.250 | 585.000 |
| 57    | 549.800 | 212.500 | 585.000 |
| 58    | 549.800 | 318.750 | 585.000 |
| 59    | 549.800 | 425.000 | 585.000 |
| 60    | 549.800 | 531.250 | 585.000 |
| 61    | 549.800 | 637.500 | 585.000 |
| 62    | 549.800 | 743.750 | 585.000 |

|     |          |         |         |
|-----|----------|---------|---------|
| 63  | 549.800  | 850.000 | 585.000 |
| 64  | 627.400  | .000    | 585.000 |
| 65  | 627.400  | 106.250 | 585.000 |
| 66  | 627.400  | 212.500 | 585.000 |
| 67  | 627.400  | 318.750 | 585.000 |
| 68  | 627.400  | 425.000 | 585.000 |
| 69  | 627.400  | 531.250 | 585.000 |
| 70  | 627.400  | 637.500 | 585.000 |
| 71  | 627.400  | 743.750 | 585.000 |
| 72  | 627.400  | 850.000 | 585.000 |
| 73  | 705.000  | .000    | 585.000 |
| 74  | 705.000  | 106.250 | 585.000 |
| 75  | 705.000  | 212.500 | 585.000 |
| 76  | 705.000  | 318.750 | 585.000 |
| 77  | 705.000  | 425.000 | 585.000 |
| 78  | 705.000  | 531.250 | 585.000 |
| 79  | 705.000  | 637.500 | 585.000 |
| 80  | 705.000  | 743.750 | 585.000 |
| 81  | 705.000  | 850.000 | 585.000 |
| 82  | 782.600  | .000    | 585.000 |
| 83  | 782.600  | 106.250 | 585.000 |
| 84  | 782.600  | 212.500 | 585.000 |
| 85  | 782.600  | 318.750 | 585.000 |
| 86  | 782.600  | 425.000 | 585.000 |
| 87  | 782.600  | 531.250 | 585.000 |
| 88  | 782.600  | 637.500 | 585.000 |
| 89  | 782.600  | 743.750 | 585.000 |
| 90  | 782.600  | 850.000 | 585.000 |
| 91  | 860.200  | .000    | 585.000 |
| 92  | 860.200  | 106.250 | 585.000 |
| 93  | 860.200  | 212.500 | 585.000 |
| 94  | 860.200  | 318.750 | 585.000 |
| 95  | 860.200  | 425.000 | 585.000 |
| 96  | 860.200  | 531.250 | 585.000 |
| 97  | 860.200  | 637.500 | 585.000 |
| 98  | 860.200  | 743.750 | 585.000 |
| 99  | 860.200  | 850.000 | 585.000 |
| 100 | 937.800  | .000    | 585.000 |
| 101 | 937.800  | 106.250 | 585.000 |
| 102 | 937.800  | 212.500 | 585.000 |
| 103 | 937.800  | 318.750 | 585.000 |
| 104 | 937.800  | 425.000 | 585.000 |
| 105 | 937.800  | 531.250 | 585.000 |
| 106 | 937.800  | 637.500 | 585.000 |
| 107 | 937.800  | 743.750 | 585.000 |
| 108 | 937.800  | 850.000 | 585.000 |
| 109 | 1015.400 | .000    | 585.000 |
| 110 | 1015.400 | 106.250 | 585.000 |
| 111 | 1015.400 | 212.500 | 585.000 |
| 112 | 1015.400 | 318.750 | 585.000 |
| 113 | 1015.400 | 425.000 | 585.000 |
| 114 | 1015.400 | 531.250 | 585.000 |
| 115 | 1015.400 | 637.500 | 585.000 |
| 116 | 1015.400 | 743.750 | 585.000 |
| 117 | 1015.400 | 850.000 | 585.000 |
| 118 | 1093.000 | .000    | 585.000 |
| 119 | 1093.000 | 106.250 | 585.000 |
| 120 | 1093.000 | 212.500 | 585.000 |
| 121 | 1093.000 | 318.750 | 585.000 |
| 122 | 1093.000 | 425.000 | 585.000 |
| 123 | 1093.000 | 531.250 | 585.000 |
| 124 | 1093.000 | 637.500 | 585.000 |
| 125 | 1093.000 | 743.750 | 585.000 |
| 126 | 1093.000 | 850.000 | 585.000 |
| 127 | 1170.600 | .000    | 585.000 |
| 128 | 1170.600 | 106.250 | 585.000 |
| 129 | 1170.600 | 212.500 | 585.000 |
| 130 | 1170.600 | 318.750 | 585.000 |
| 131 | 1170.600 | 425.000 | 585.000 |
| 132 | 1170.600 | 531.250 | 585.000 |
| 133 | 1170.600 | 637.500 | 585.000 |
| 134 | 1170.600 | 743.750 | 585.000 |
| 135 | 1170.600 | 850.000 | 585.000 |
| 136 | 1248.200 | .000    | 585.000 |
| 137 | 1248.200 | 106.250 | 585.000 |
| 138 | 1248.200 | 212.500 | 585.000 |
| 139 | 1248.200 | 318.750 | 585.000 |
| 140 | 1248.200 | 425.000 | 585.000 |
| 141 | 1248.200 | 531.250 | 585.000 |
| 142 | 1248.200 | 637.500 | 585.000 |

|     |          |         |         |
|-----|----------|---------|---------|
| 143 | 1248.200 | 743.750 | 585.000 |
| 144 | 1248.200 | 850.000 | 585.000 |
| 145 | 1390.000 | .000    | 585.000 |
| 146 | 1390.000 | 106.250 | 585.000 |
| 147 | 1390.000 | 212.500 | 585.000 |
| 148 | 1390.000 | 318.750 | 585.000 |
| 149 | 1390.000 | 425.000 | 585.000 |
| 150 | 1390.000 | 531.250 | 585.000 |
| 151 | 1390.000 | 637.500 | 585.000 |
| 152 | 1390.000 | 743.750 | 585.000 |
| 153 | 1390.000 | 850.000 | 585.000 |
| 154 | .000     | .000    | .000    |
| 155 | .000     | .000    | 117.000 |
| 156 | .000     | .000    | 234.000 |
| 157 | .000     | .000    | 351.000 |
| 158 | .000     | .000    | 468.000 |
| 159 | 161.800  | .000    | .000    |
| 160 | 161.800  | .000    | 117.000 |
| 161 | 161.800  | .000    | 234.000 |
| 162 | 161.800  | .000    | 351.000 |
| 163 | 161.800  | .000    | 468.000 |
| 164 | 317.000  | .000    | .000    |
| 165 | 317.000  | .000    | 117.000 |
| 166 | 317.000  | .000    | 234.000 |
| 167 | 317.000  | .000    | 351.000 |
| 168 | 317.000  | .000    | 468.000 |
| 169 | 394.600  | .000    | .000    |
| 170 | 394.600  | .000    | 117.000 |
| 171 | 394.600  | .000    | 234.000 |
| 172 | 394.600  | .000    | 351.000 |
| 173 | 394.600  | .000    | 468.000 |
| 174 | 549.800  | .000    | .000    |
| 175 | 549.800  | .000    | 117.000 |
| 176 | 549.800  | .000    | 234.000 |
| 177 | 549.800  | .000    | 351.000 |
| 178 | 549.800  | .000    | 468.000 |
| 179 | 627.400  | .000    | .000    |
| 180 | 627.400  | .000    | 117.000 |
| 181 | 627.400  | .000    | 234.000 |
| 182 | 627.400  | .000    | 351.000 |
| 183 | 627.400  | .000    | 468.000 |
| 184 | 782.600  | .000    | .000    |
| 185 | 782.600  | .000    | 117.000 |
| 186 | 782.600  | .000    | 234.000 |
| 187 | 782.600  | .000    | 351.000 |
| 188 | 782.600  | .000    | 468.000 |
| 189 | 860.200  | .000    | .000    |
| 190 | 860.200  | .000    | 117.000 |
| 191 | 860.200  | .000    | 234.000 |
| 192 | 860.200  | .000    | 351.000 |
| 193 | 860.200  | .000    | 468.000 |
| 194 | 1015.400 | .000    | .000    |
| 195 | 1015.400 | .000    | 117.000 |
| 196 | 1015.400 | .000    | 234.000 |
| 197 | 1015.400 | .000    | 351.000 |
| 198 | 1015.400 | .000    | 468.000 |
| 199 | 1093.000 | .000    | .000    |
| 200 | 1093.000 | .000    | 117.000 |
| 201 | 1093.000 | .000    | 234.000 |
| 202 | 1093.000 | .000    | 351.000 |
| 203 | 1093.000 | .000    | 468.000 |
| 204 | 1248.200 | .000    | .000    |
| 205 | 1248.200 | .000    | 117.000 |
| 206 | 1248.200 | .000    | 234.000 |
| 207 | 1248.200 | .000    | 351.000 |
| 208 | 1248.200 | .000    | 468.000 |
| 209 | 1390.000 | .000    | .000    |
| 210 | 1390.000 | .000    | 117.000 |
| 211 | 1390.000 | .000    | 234.000 |
| 212 | 1390.000 | .000    | 351.000 |
| 213 | 1390.000 | .000    | 468.000 |
| 214 | 472.200  | .000    | .000    |
| 215 | 937.800  | .000    | .000    |
| 216 | .000     | 850.000 | .000    |
| 217 | .000     | 850.000 | 117.000 |
| 218 | .000     | 850.000 | 234.000 |
| 219 | .000     | 850.000 | 351.000 |
| 220 | .000     | 850.000 | 468.000 |
| 221 | 161.800  | 850.000 | .000    |
| 222 | 161.800  | 850.000 | 117.000 |

|     |          |         |         |
|-----|----------|---------|---------|
| 223 | 161.800  | 850.000 | 234.000 |
| 224 | 161.800  | 850.000 | 351.000 |
| 225 | 161.800  | 850.000 | 468.000 |
| 226 | 317.000  | 850.000 | .000    |
| 227 | 317.000  | 850.000 | 117.000 |
| 228 | 317.000  | 850.000 | 234.000 |
| 229 | 317.000  | 850.000 | 351.000 |
| 230 | 317.000  | 850.000 | 468.000 |
| 231 | 394.600  | 850.000 | .000    |
| 232 | 394.600  | 850.000 | 117.000 |
| 233 | 394.600  | 850.000 | 234.000 |
| 234 | 394.600  | 850.000 | 351.000 |
| 235 | 394.600  | 850.000 | 468.000 |
| 236 | 549.800  | 850.000 | .000    |
| 237 | 549.800  | 850.000 | 117.000 |
| 238 | 549.800  | 850.000 | 234.000 |
| 239 | 549.800  | 850.000 | 351.000 |
| 240 | 549.800  | 850.000 | 468.000 |
| 241 | 627.400  | 850.000 | .000    |
| 242 | 627.400  | 850.000 | 117.000 |
| 243 | 627.400  | 850.000 | 234.000 |
| 244 | 627.400  | 850.000 | 351.000 |
| 245 | 627.400  | 850.000 | 468.000 |
| 246 | 782.600  | 850.000 | .000    |
| 247 | 782.600  | 850.000 | 117.000 |
| 248 | 782.600  | 850.000 | 234.000 |
| 249 | 782.600  | 850.000 | 351.000 |
| 250 | 782.600  | 850.000 | 468.000 |
| 251 | 860.200  | 850.000 | .000    |
| 252 | 860.200  | 850.000 | 117.000 |
| 253 | 860.200  | 850.000 | 234.000 |
| 254 | 860.200  | 850.000 | 351.000 |
| 255 | 860.200  | 850.000 | 468.000 |
| 256 | 1015.400 | 850.000 | .000    |
| 257 | 1015.400 | 850.000 | 117.000 |
| 258 | 1015.400 | 850.000 | 234.000 |
| 259 | 1015.400 | 850.000 | 351.000 |
| 260 | 1015.400 | 850.000 | 468.000 |
| 261 | 1093.000 | 850.000 | .000    |
| 262 | 1093.000 | 850.000 | 117.000 |
| 263 | 1093.000 | 850.000 | 234.000 |
| 264 | 1093.000 | 850.000 | 351.000 |
| 265 | 1093.000 | 850.000 | 468.000 |
| 266 | 1248.200 | 850.000 | .000    |
| 267 | 1248.200 | 850.000 | 117.000 |
| 268 | 1248.200 | 850.000 | 234.000 |
| 269 | 1248.200 | 850.000 | 351.000 |
| 270 | 1248.200 | 850.000 | 468.000 |
| 271 | 1390.000 | 850.000 | .000    |
| 272 | 1390.000 | 850.000 | 117.000 |
| 273 | 1390.000 | 850.000 | 234.000 |
| 274 | 1390.000 | 850.000 | 351.000 |
| 275 | 1390.000 | 850.000 | 468.000 |
| 276 | 472.200  | 850.000 | .000    |
| 277 | 937.800  | 850.000 | .000    |
| 278 | .000     | 106.250 | .000    |
| 279 | .000     | 212.500 | .000    |
| 280 | .000     | 318.750 | .000    |
| 281 | .000     | 425.000 | .000    |
| 282 | .000     | 531.250 | .000    |
| 283 | .000     | 637.500 | .000    |
| 284 | .000     | 743.750 | .000    |
| 285 | 154.444  | 106.250 | .000    |
| 286 | 154.444  | 212.500 | .000    |
| 287 | 154.444  | 318.750 | .000    |
| 288 | 154.444  | 425.000 | .000    |
| 289 | 154.444  | 531.250 | .000    |
| 290 | 154.444  | 637.500 | .000    |
| 291 | 154.444  | 743.750 | .000    |
| 292 | 308.889  | 106.250 | .000    |
| 293 | 308.889  | 212.500 | .000    |
| 294 | 308.889  | 318.750 | .000    |
| 295 | 308.889  | 425.000 | .000    |
| 296 | 308.889  | 531.250 | .000    |
| 297 | 308.889  | 637.500 | .000    |
| 298 | 308.889  | 743.750 | .000    |
| 299 | 463.333  | 106.250 | .000    |
| 300 | 463.333  | 212.500 | .000    |
| 301 | 463.333  | 318.750 | .000    |
| 302 | 463.333  | 425.000 | .000    |

|     |          |         |      |
|-----|----------|---------|------|
| 303 | 463.333  | 531.250 | .000 |
| 304 | 463.333  | 637.500 | .000 |
| 305 | 463.333  | 743.750 | .000 |
| 306 | 617.778  | 106.250 | .000 |
| 307 | 617.778  | 212.500 | .000 |
| 308 | 617.778  | 318.750 | .000 |
| 309 | 617.778  | 425.000 | .000 |
| 310 | 617.778  | 531.250 | .000 |
| 311 | 617.778  | 637.500 | .000 |
| 312 | 617.778  | 743.750 | .000 |
| 313 | 772.222  | 106.250 | .000 |
| 314 | 772.222  | 212.500 | .000 |
| 315 | 772.222  | 318.750 | .000 |
| 316 | 772.222  | 425.000 | .000 |
| 317 | 772.222  | 531.250 | .000 |
| 318 | 772.222  | 637.500 | .000 |
| 319 | 772.222  | 743.750 | .000 |
| 320 | 926.667  | 106.250 | .000 |
| 321 | 926.667  | 212.500 | .000 |
| 322 | 926.667  | 318.750 | .000 |
| 323 | 926.667  | 425.000 | .000 |
| 324 | 926.667  | 531.250 | .000 |
| 325 | 926.667  | 637.500 | .000 |
| 326 | 926.667  | 743.750 | .000 |
| 327 | 1081.111 | 106.250 | .000 |
| 328 | 1081.111 | 212.500 | .000 |
| 329 | 1081.111 | 318.750 | .000 |
| 330 | 1081.111 | 425.000 | .000 |
| 331 | 1081.111 | 531.250 | .000 |
| 332 | 1081.111 | 637.500 | .000 |
| 333 | 1081.111 | 743.750 | .000 |
| 334 | 1235.556 | 106.250 | .000 |
| 335 | 1235.556 | 212.500 | .000 |
| 336 | 1235.556 | 318.750 | .000 |
| 337 | 1235.556 | 425.000 | .000 |
| 338 | 1235.556 | 531.250 | .000 |
| 339 | 1235.556 | 637.500 | .000 |
| 340 | 1235.556 | 743.750 | .000 |
| 341 | 1390.000 | 106.250 | .000 |
| 342 | 1390.000 | 212.500 | .000 |
| 343 | 1390.000 | 318.750 | .000 |
| 344 | 1390.000 | 425.000 | .000 |
| 345 | 1390.000 | 531.250 | .000 |
| 346 | 1390.000 | 637.500 | .000 |
| 347 | 1390.000 | 743.750 | .000 |

# R E S T R A I N T   D A T A

| JOINT | RX | RY | RZ | RXX | RYY | RZZ |
|-------|----|----|----|-----|-----|-----|
| 154   | 1  | 1  | 0  | 0   | 0   | 0   |
| 209   | 1  | 1  | 0  | 0   | 0   | 0   |
| 216   | 1  | 1  | 0  | 0   | 0   | 0   |
| 271   | 1  | 1  | 0  | 0   | 0   | 0   |

# S P R I N G   D A T A

| JOINT | KX       | KY       | KZ       | KRX      | KRY      | KRZ      |
|-------|----------|----------|----------|----------|----------|----------|
| 154   | .000E+00 | .000E+00 | .430E+01 | .000E+00 | .000E+00 | .000E+00 |
| 216   | .000E+00 | .000E+00 | .430E+01 | .000E+00 | .000E+00 | .000E+00 |
| 278   | .000E+00 | .000E+00 | .860E+01 | .000E+00 | .000E+00 | .000E+00 |
| 279   | .000E+00 | .000E+00 | .860E+01 | .000E+00 | .000E+00 | .000E+00 |
| 280   | .000E+00 | .000E+00 | .860E+01 | .000E+00 | .000E+00 | .000E+00 |
| 281   | .000E+00 | .000E+00 | .860E+01 | .000E+00 | .000E+00 | .000E+00 |
| 282   | .000E+00 | .000E+00 | .860E+01 | .000E+00 | .000E+00 | .000E+00 |
| 283   | .000E+00 | .000E+00 | .860E+01 | .000E+00 | .000E+00 | .000E+00 |
| 284   | .000E+00 | .000E+00 | .860E+01 | .000E+00 | .000E+00 | .000E+00 |
| 209   | .000E+00 | .000E+00 | .380E+01 | .000E+00 | .000E+00 | .000E+00 |
| 271   | .000E+00 | .000E+00 | .380E+01 | .000E+00 | .000E+00 | .000E+00 |
| 341   | .000E+00 | .000E+00 | .760E+01 | .000E+00 | .000E+00 | .000E+00 |
| 342   | .000E+00 | .000E+00 | .760E+01 | .000E+00 | .000E+00 | .000E+00 |
| 343   | .000E+00 | .000E+00 | .760E+01 | .000E+00 | .000E+00 | .000E+00 |
| 344   | .000E+00 | .000E+00 | .760E+01 | .000E+00 | .000E+00 | .000E+00 |
| 345   | .000E+00 | .000E+00 | .760E+01 | .000E+00 | .000E+00 | .000E+00 |
| 346   | .000E+00 | .000E+00 | .760E+01 | .000E+00 | .000E+00 | .000E+00 |
| 347   | .000E+00 | .000E+00 | .760E+01 | .000E+00 | .000E+00 | .000E+00 |
| 159   | .000E+00 | .000E+00 | .840E+01 | .000E+00 | .000E+00 | .000E+00 |
| 221   | .000E+00 | .000E+00 | .840E+01 | .000E+00 | .000E+00 | .000E+00 |
| 285   | .000E+00 | .000E+00 | .168E+02 | .000E+00 | .000E+00 | .000E+00 |
| 286   | .000E+00 | .000E+00 | .168E+02 | .000E+00 | .000E+00 | .000E+00 |
| 287   | .000E+00 | .000E+00 | .168E+02 | .000E+00 | .000E+00 | .000E+00 |



[illegible]

|     |          |          |          |          |          |          |
|-----|----------|----------|----------|----------|----------|----------|
| 46  | .000E+00 | .000E+00 | .155E-02 | .000E+00 | .000E+00 | .000E+00 |
| 54  | .000E+00 | .000E+00 | .155E-02 | .000E+00 | .000E+00 | .000E+00 |
| 100 | .000E+00 | .000E+00 | .155E-02 | .000E+00 | .000E+00 | .000E+00 |
| 108 | .000E+00 | .000E+00 | .155E-02 | .000E+00 | .000E+00 | .000E+00 |
| 38  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 39  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 40  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 41  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 42  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 43  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 44  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 56  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 57  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 58  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 59  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 60  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 61  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 62  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 92  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 93  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 94  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 95  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 96  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 97  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 98  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 110 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 111 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 112 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 113 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 114 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 115 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 116 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 47  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 48  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 49  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 50  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 51  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 52  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 53  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 101 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 102 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 103 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 104 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 105 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 106 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 107 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 136 | .000E+00 | .000E+00 | .141E-02 | .000E+00 | .000E+00 | .000E+00 |
| 144 | .000E+00 | .000E+00 | .141E-02 | .000E+00 | .000E+00 | .000E+00 |
| 137 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 138 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 139 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 140 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 141 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 142 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 143 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 145 | .000E+00 | .000E+00 | .912E-03 | .000E+00 | .000E+00 | .000E+00 |
| 153 | .000E+00 | .000E+00 | .912E-03 | .000E+00 | .000E+00 | .000E+00 |
| 146 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |
| 147 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |
| 148 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |
| 149 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |
| 150 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |
| 151 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |
| 152 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |

# FRAME CONTROL DATA

|                                     |    |
|-------------------------------------|----|
| NUMBER OF MEMBER SECTION PROPERTIES | 20 |
| NUMBER OF SPAN LOADING PATTERNS     | 0  |

| LOAD | GRAVITATIONAL MULTIPLIERS |      |      | TEMPERATURE | PRESTRESS   |
|------|---------------------------|------|------|-------------|-------------|
| COND | X                         | Y    | Z    | MULTIPLIERS | MULTIPLIERS |
| 1    | .000                      | .000 | .000 | .000        | .000        |
| 2    | .000                      | .000 | .000 | .000        | .000        |
| 3    | .000                      | .000 | .000 | .000        | .000        |

# SECTION PROPERTY DATA

| PROP | AREA | TORSIONAL | MOMENTS OF INERTIA |     | SHEAR AREAS |    |
|------|------|-----------|--------------------|-----|-------------|----|
| ID   |      | INERTIA   | I33                | I22 | A2          | A3 |

|    |          |            |            |            |          |          |
|----|----------|------------|------------|------------|----------|----------|
| 1  | .742E+04 | .16800E+08 | .15070E+08 | .56000E+07 | .000E+00 | .000E+00 |
| 2  | .110E+05 | .16620E+08 | .17210E+08 | .83100E+07 | .000E+00 | .000E+00 |
| 3  | .712E+04 | .10760E+08 | .33400E+07 | .53800E+07 | .000E+00 | .000E+00 |
| 4  | .101E+05 | .15180E+08 | .12000E+08 | .75900E+07 | .000E+00 | .000E+00 |
| 5  | .652E+04 | .14760E+08 | .10260E+08 | .49200E+07 | .000E+00 | .000E+00 |
| 6  | .774E+04 | .21000E+08 | .47600E+07 | .70000E+07 | .000E+00 | .000E+00 |
| 7  | .975E+04 | .14720E+08 | .85800E+07 | .73600E+07 | .000E+00 | .000E+00 |
| 8  | .405E+04 | .25290E+07 | .88240E+07 | .84300E+06 | .000E+00 | .000E+00 |
| 9  | .793E+04 | .33000E+07 | .16610E+08 | .16500E+07 | .000E+00 | .000E+00 |
| 10 | .582E+04 | .24300E+07 | .87600E+07 | .12125E+07 | .000E+00 | .000E+00 |
| 11 | .743E+04 | .31000E+07 | .13980E+08 | .15500E+07 | .000E+00 | .000E+00 |
| 12 | .355E+04 | .22200E+07 | .59400E+07 | .73850E+06 | .000E+00 | .000E+00 |
| 13 | .758E+04 | .20530E+08 | .43400E+07 | .68400E+07 | .000E+00 | .000E+00 |
| 14 | .585E+04 | .13340E+08 | .12200E+07 | .66700E+07 | .000E+00 | .000E+00 |
| 15 | .722E+04 | .16200E+08 | .13900E+08 | .54000E+07 | .000E+00 | .000E+00 |
| 16 | .143E+05 | .21430E+08 | .26780E+08 | .10720E+08 | .000E+00 | .000E+00 |
| 17 | .139E+05 | .20920E+08 | .24840E+08 | .10460E+08 | .000E+00 | .000E+00 |
| 18 | .133E+05 | .20000E+08 | .21840E+08 | .10000E+08 | .000E+00 | .000E+00 |
| 19 | .637E+04 | .14360E+08 | .95200E+07 | .47900E+07 | .000E+00 | .000E+00 |
| 20 | .950E+04 | .14290E+08 | .79170E+07 | .71400E+07 | .000E+00 | .000E+00 |

# M A T E R I A L   P R O P E R T Y   D A T A

| PROP ID | MODULUS OF ELASTICITY | SHEAR MODULUS | WEIGHT PER UNIT LEN | MASS PER UNIT LEN | THERMAL EXPANSION |
|---------|-----------------------|---------------|---------------------|-------------------|-------------------|
| 1       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 2       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 3       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 4       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 5       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 6       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 7       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 8       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 9       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 10      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 11      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 12      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 13      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 14      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 15      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 16      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 17      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 18      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 19      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 20      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |

# F R A M E   E L E M E N T   D A T A

| ELT ID | JOINT END-I | JOINT END-J | LOCAL-AXIS N1 N2 |   | PROPERTY-ID END-I END-J VAR |   |   | REL CODES | REF TEMP | ELEMENT LENGTH |
|--------|-------------|-------------|------------------|---|-----------------------------|---|---|-----------|----------|----------------|
| 1      | 1           | 2           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 2      | 2           | 3           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 3      | 3           | 4           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 4      | 4           | 5           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 5      | 5           | 6           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 6      | 6           | 7           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 7      | 7           | 8           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 8      | 8           | 9           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 9      | 10          | 11          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 10     | 11          | 12          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 11     | 12          | 13          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 12     | 13          | 14          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 13     | 14          | 15          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 14     | 15          | 16          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 15     | 16          | 17          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 16     | 17          | 18          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 17     | 19          | 20          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 18     | 20          | 21          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 19     | 21          | 22          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 20     | 22          | 23          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 21     | 23          | 24          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 22     | 24          | 25          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 23     | 25          | 26          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 24     | 26          | 27          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 25     | 28          | 29          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 26     | 29          | 30          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 27     | 30          | 31          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 28     | 31          | 32          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 29     | 32          | 33          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |

|     |     |     |   |   |   |   |   |        |     |        |
|-----|-----|-----|---|---|---|---|---|--------|-----|--------|
| 30  | 33  | 34  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 31  | 34  | 35  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 32  | 35  | 36  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 33  | 37  | 38  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 34  | 38  | 39  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 35  | 39  | 40  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 36  | 40  | 41  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 37  | 41  | 42  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 38  | 42  | 43  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 39  | 43  | 44  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 40  | 44  | 45  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 41  | 46  | 47  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 42  | 47  | 48  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 43  | 48  | 49  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 44  | 49  | 50  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 45  | 50  | 51  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 46  | 51  | 52  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 47  | 52  | 53  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 48  | 53  | 54  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 49  | 55  | 56  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 50  | 56  | 57  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 51  | 57  | 58  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 52  | 58  | 59  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 53  | 59  | 60  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 54  | 60  | 61  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 55  | 61  | 62  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 56  | 62  | 63  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 57  | 64  | 65  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 58  | 65  | 66  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 59  | 66  | 67  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 60  | 67  | 68  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 61  | 68  | 69  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 62  | 69  | 70  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 63  | 70  | 71  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 64  | 71  | 72  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 65  | 73  | 74  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 66  | 74  | 75  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 67  | 75  | 76  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 68  | 76  | 77  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 69  | 77  | 78  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 70  | 78  | 79  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 71  | 79  | 80  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 72  | 80  | 81  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 73  | 82  | 83  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 74  | 83  | 84  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 75  | 84  | 85  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 76  | 85  | 86  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 77  | 86  | 87  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 78  | 87  | 88  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 79  | 88  | 89  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 80  | 89  | 90  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 81  | 91  | 92  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 82  | 92  | 93  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 83  | 93  | 94  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 84  | 94  | 95  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 85  | 95  | 96  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 86  | 96  | 97  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 87  | 97  | 98  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 88  | 98  | 99  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 89  | 100 | 101 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 90  | 101 | 102 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 91  | 102 | 103 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 92  | 103 | 104 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 93  | 104 | 105 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 94  | 105 | 106 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 95  | 106 | 107 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 96  | 107 | 108 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 97  | 109 | 110 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 98  | 110 | 111 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 99  | 111 | 112 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 100 | 112 | 113 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 101 | 113 | 114 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 102 | 114 | 115 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 103 | 115 | 116 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 104 | 116 | 117 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 105 | 118 | 119 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 106 | 119 | 120 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 107 | 120 | 121 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 108 | 121 | 122 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 109 | 122 | 123 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |

|     |     |     |   |   |   |   |   |        |     |        |
|-----|-----|-----|---|---|---|---|---|--------|-----|--------|
| 110 | 123 | 124 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 111 | 124 | 125 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 112 | 125 | 126 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 113 | 127 | 128 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 114 | 128 | 129 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 115 | 129 | 130 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 116 | 130 | 131 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 117 | 131 | 132 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 118 | 132 | 133 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 119 | 133 | 134 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 120 | 134 | 135 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 121 | 136 | 137 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 122 | 137 | 138 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 123 | 138 | 139 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 124 | 139 | 140 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 125 | 140 | 141 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 126 | 141 | 142 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 127 | 142 | 143 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 128 | 143 | 144 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 129 | 145 | 146 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 130 | 146 | 147 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 131 | 147 | 148 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 132 | 148 | 149 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 133 | 149 | 150 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 134 | 150 | 151 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 135 | 151 | 152 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 136 | 152 | 153 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 137 | 1   | 10  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 161.80 |
| 138 | 10  | 19  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 139 | 19  | 28  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 140 | 28  | 37  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 141 | 37  | 46  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 142 | 46  | 55  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 143 | 55  | 64  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 144 | 64  | 73  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 145 | 73  | 82  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 146 | 82  | 91  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 147 | 91  | 100 | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 148 | 100 | 109 | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 149 | 109 | 118 | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 150 | 118 | 127 | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 151 | 127 | 136 | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 152 | 136 | 145 | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 141.80 |
| 153 | 2   | 11  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 154 | 11  | 20  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 155 | 20  | 29  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 156 | 29  | 38  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 157 | 38  | 47  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 158 | 47  | 56  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 159 | 56  | 65  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 160 | 65  | 74  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 161 | 74  | 83  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 162 | 83  | 92  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 163 | 92  | 101 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 164 | 101 | 110 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 165 | 110 | 119 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 166 | 119 | 128 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 167 | 128 | 137 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 168 | 137 | 146 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 169 | 3   | 12  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 170 | 12  | 21  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 171 | 21  | 30  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 172 | 30  | 39  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 173 | 39  | 48  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 174 | 48  | 57  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 175 | 57  | 66  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 176 | 66  | 75  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 177 | 75  | 84  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 178 | 84  | 93  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 179 | 93  | 102 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 180 | 102 | 111 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 181 | 111 | 120 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 182 | 120 | 129 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 183 | 129 | 138 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 184 | 138 | 147 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 185 | 4   | 13  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 186 | 13  | 22  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 187 | 22  | 31  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 188 | 31  | 40  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 189 | 40  | 49  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |

|     |     |     |   |   |   |   |   |        |     |        |
|-----|-----|-----|---|---|---|---|---|--------|-----|--------|
| 190 | 49  | 58  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 191 | 58  | 67  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 192 | 67  | 76  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 193 | 76  | 85  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 194 | 85  | 94  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 195 | 94  | 103 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 196 | 103 | 112 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 197 | 112 | 121 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 198 | 121 | 130 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 199 | 130 | 139 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 200 | 139 | 148 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 201 | 5   | 14  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 202 | 14  | 23  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 203 | 23  | 32  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 204 | 32  | 41  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 205 | 41  | 50  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 206 | 50  | 59  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 207 | 59  | 68  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 208 | 68  | 77  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 209 | 77  | 86  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 210 | 86  | 95  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 211 | 95  | 104 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 212 | 104 | 113 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 213 | 113 | 122 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 214 | 122 | 131 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 215 | 131 | 140 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 216 | 140 | 149 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 217 | 6   | 15  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 218 | 15  | 24  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 219 | 24  | 33  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 220 | 33  | 42  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 221 | 42  | 51  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 222 | 51  | 60  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 223 | 60  | 69  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 224 | 69  | 78  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 225 | 78  | 87  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 226 | 87  | 96  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 227 | 96  | 105 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 228 | 105 | 114 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 229 | 114 | 123 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 230 | 123 | 132 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 231 | 132 | 141 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 232 | 141 | 150 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 233 | 7   | 16  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 234 | 16  | 25  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 235 | 25  | 34  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 236 | 34  | 43  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 237 | 43  | 52  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 238 | 52  | 61  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 239 | 61  | 70  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 240 | 70  | 79  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 241 | 79  | 88  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 242 | 88  | 97  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 243 | 97  | 106 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 244 | 106 | 115 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 245 | 115 | 124 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 246 | 124 | 133 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 247 | 133 | 142 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 248 | 142 | 151 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 249 | 8   | 17  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 250 | 17  | 26  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 251 | 26  | 35  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 252 | 35  | 44  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 253 | 44  | 53  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 254 | 53  | 62  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 255 | 62  | 71  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 256 | 71  | 80  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 257 | 80  | 89  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 258 | 89  | 98  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 259 | 98  | 107 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 260 | 107 | 116 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 261 | 116 | 125 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 262 | 125 | 134 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 263 | 134 | 143 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 264 | 143 | 152 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 265 | 9   | 18  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 161.80 |
| 266 | 18  | 27  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 267 | 27  | 36  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 268 | 36  | 45  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 269 | 45  | 54  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |

|     |     |     |    |   |    |    |   |        |     |        |
|-----|-----|-----|----|---|----|----|---|--------|-----|--------|
| 270 | 54  | 63  | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 271 | 63  | 72  | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 272 | 72  | 81  | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 273 | 81  | 90  | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 274 | 90  | 99  | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 275 | 99  | 108 | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 276 | 108 | 117 | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 277 | 117 | 126 | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 278 | 126 | 135 | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 279 | 135 | 144 | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 280 | 144 | 153 | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 141.80 |
| 281 | 154 | 155 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 282 | 155 | 156 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 283 | 156 | 157 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 284 | 157 | 158 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 285 | 158 | 1   | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 286 | 159 | 160 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 287 | 160 | 161 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 288 | 161 | 162 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 289 | 162 | 163 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 290 | 163 | 10  | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 291 | 164 | 165 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 292 | 165 | 166 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 293 | 166 | 167 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 294 | 167 | 168 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 295 | 168 | 28  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 296 | 169 | 170 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 297 | 170 | 171 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 298 | 171 | 172 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 299 | 172 | 173 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 300 | 173 | 37  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 301 | 174 | 175 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 302 | 175 | 176 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 303 | 176 | 177 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 304 | 177 | 178 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 305 | 178 | 55  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 306 | 179 | 180 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 307 | 180 | 181 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 308 | 181 | 182 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 309 | 182 | 183 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 310 | 183 | 64  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 311 | 184 | 185 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 312 | 185 | 186 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 313 | 186 | 187 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 314 | 187 | 188 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 315 | 188 | 82  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 316 | 189 | 190 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 317 | 190 | 191 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 318 | 191 | 192 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 319 | 192 | 193 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 320 | 193 | 91  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 321 | 194 | 195 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 322 | 195 | 196 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 323 | 196 | 197 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 324 | 197 | 198 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 325 | 198 | 109 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 326 | 199 | 200 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 327 | 200 | 201 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 328 | 201 | 202 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 329 | 202 | 203 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 330 | 203 | 118 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 331 | 204 | 205 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 332 | 205 | 206 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 333 | 206 | 207 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 334 | 207 | 208 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 335 | 208 | 136 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 336 | 209 | 210 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 337 | 210 | 211 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 338 | 211 | 212 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 339 | 212 | 213 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 340 | 213 | 145 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 341 | 154 | 159 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 161.80 |
| 342 | 159 | 164 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 155.20 |
| 343 | 164 | 169 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 344 | 169 | 214 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 345 | 214 | 174 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 346 | 174 | 179 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 347 | 179 | 184 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 155.20 |
| 348 | 184 | 189 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 349 | 189 | 215 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |

|     |     |     |    |   |    |    |   |        |     |        |
|-----|-----|-----|----|---|----|----|---|--------|-----|--------|
| 350 | 215 | 194 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 351 | 194 | 199 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 352 | 199 | 204 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 155.20 |
| 353 | 204 | 209 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 141.80 |
| 354 | 155 | 160 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 355 | 165 | 170 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 356 | 175 | 180 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 357 | 185 | 190 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 358 | 195 | 200 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 359 | 205 | 210 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 360 | 156 | 161 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 361 | 166 | 171 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 362 | 176 | 181 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 363 | 186 | 191 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 364 | 196 | 201 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 365 | 206 | 211 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 366 | 157 | 162 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 367 | 167 | 172 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 368 | 177 | 182 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 369 | 187 | 192 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 370 | 197 | 202 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 371 | 207 | 212 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 372 | 158 | 163 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 373 | 168 | 173 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 374 | 178 | 183 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 375 | 188 | 193 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 376 | 198 | 203 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 377 | 208 | 213 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 378 | 216 | 217 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 379 | 217 | 218 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 380 | 218 | 219 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 381 | 219 | 220 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 382 | 220 | 9   | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 383 | 221 | 222 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 384 | 222 | 223 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 385 | 223 | 224 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 386 | 224 | 225 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 387 | 225 | 18  | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 388 | 226 | 227 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 389 | 227 | 228 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 390 | 228 | 229 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 391 | 229 | 230 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 392 | 230 | 36  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 393 | 231 | 232 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 394 | 232 | 233 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 395 | 233 | 234 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 396 | 234 | 235 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 397 | 235 | 45  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 398 | 236 | 237 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 399 | 237 | 238 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 400 | 238 | 239 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 401 | 239 | 240 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 402 | 240 | 63  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 403 | 241 | 242 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 404 | 242 | 243 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 405 | 243 | 244 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 406 | 244 | 245 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 407 | 245 | 72  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 408 | 246 | 247 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 409 | 247 | 248 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 410 | 248 | 249 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 411 | 249 | 250 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 412 | 250 | 90  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 413 | 251 | 252 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 414 | 252 | 253 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 415 | 253 | 254 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 416 | 254 | 255 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 417 | 255 | 99  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 418 | 256 | 257 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 419 | 257 | 258 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 420 | 258 | 259 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 421 | 259 | 260 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 422 | 260 | 117 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 423 | 261 | 262 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 424 | 262 | 263 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 425 | 263 | 264 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 426 | 264 | 265 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 427 | 265 | 126 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 428 | 266 | 267 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 429 | 267 | 268 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |

|     |     |     |    |   |    |    |   |        |     |        |
|-----|-----|-----|----|---|----|----|---|--------|-----|--------|
| 430 | 268 | 269 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 431 | 269 | 270 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 432 | 270 | 144 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 433 | 271 | 272 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 434 | 272 | 273 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 435 | 273 | 274 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 436 | 274 | 275 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 437 | 275 | 153 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 438 | 216 | 221 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 161.80 |
| 439 | 221 | 226 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 155.20 |
| 440 | 226 | 231 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 441 | 231 | 276 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 442 | 276 | 236 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 443 | 236 | 241 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 444 | 241 | 246 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 155.20 |
| 445 | 246 | 251 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 446 | 251 | 277 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 447 | 277 | 256 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 448 | 256 | 261 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 449 | 261 | 266 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 155.20 |
| 450 | 266 | 271 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 141.80 |
| 451 | 217 | 222 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 452 | 227 | 232 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 453 | 237 | 242 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 454 | 247 | 252 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 455 | 257 | 262 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 456 | 267 | 272 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 457 | 218 | 223 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 458 | 228 | 233 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 459 | 238 | 243 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 460 | 248 | 253 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 461 | 258 | 263 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 462 | 268 | 273 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 463 | 219 | 224 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 464 | 229 | 234 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 465 | 239 | 244 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 466 | 249 | 254 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 467 | 259 | 264 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 468 | 269 | 274 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 469 | 220 | 225 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 470 | 230 | 235 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 471 | 240 | 245 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 472 | 250 | 255 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 473 | 260 | 265 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 474 | 270 | 275 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 475 | 154 | 278 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 476 | 278 | 279 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 477 | 279 | 280 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 478 | 280 | 281 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 479 | 281 | 282 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 480 | 282 | 283 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 481 | 283 | 284 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 482 | 284 | 216 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 483 | 159 | 285 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.50 |
| 484 | 285 | 286 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.25 |
| 485 | 286 | 287 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.25 |
| 486 | 287 | 288 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.25 |
| 487 | 288 | 289 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.25 |
| 488 | 289 | 290 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.25 |
| 489 | 290 | 291 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.25 |
| 490 | 291 | 221 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.50 |
| 491 | 164 | 292 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.56 |
| 499 | 214 | 299 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.62 |
| 507 | 179 | 306 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.68 |
| 515 | 184 | 313 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.76 |
| 523 | 215 | 320 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.83 |
| 531 | 199 | 327 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.91 |
| 498 | 298 | 226 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.56 |
| 506 | 305 | 276 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.62 |
| 514 | 312 | 241 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.68 |
| 522 | 319 | 246 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.76 |
| 530 | 326 | 277 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.83 |
| 538 | 333 | 261 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.91 |
| 492 | 292 | 293 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 500 | 299 | 300 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 508 | 306 | 307 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 516 | 313 | 314 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 524 | 320 | 321 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 532 | 327 | 328 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 493 | 293 | 294 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |

|     |     |     |   |   |    |    |   |        |     |        |
|-----|-----|-----|---|---|----|----|---|--------|-----|--------|
| 501 | 300 | 301 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 509 | 307 | 308 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 517 | 314 | 315 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 525 | 321 | 322 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 533 | 328 | 329 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 494 | 294 | 295 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 502 | 301 | 302 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 510 | 308 | 309 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 518 | 315 | 316 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 526 | 322 | 323 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 534 | 329 | 330 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 495 | 295 | 296 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 503 | 302 | 303 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 511 | 309 | 310 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 519 | 316 | 317 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 527 | 323 | 324 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 535 | 330 | 331 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 496 | 296 | 297 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 504 | 303 | 304 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 512 | 310 | 311 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 520 | 317 | 318 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 528 | 324 | 325 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 536 | 331 | 332 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 497 | 297 | 298 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 505 | 304 | 305 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 513 | 311 | 312 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 521 | 318 | 319 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 529 | 325 | 326 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 537 | 332 | 333 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 539 | 204 | 334 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 107.00 |
| 540 | 334 | 335 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 106.25 |
| 541 | 335 | 336 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 106.25 |
| 542 | 336 | 337 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 106.25 |
| 543 | 337 | 338 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 106.25 |
| 544 | 338 | 339 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 106.25 |
| 545 | 339 | 340 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 106.25 |
| 546 | 340 | 266 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 107.00 |
| 547 | 209 | 341 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 548 | 341 | 342 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 549 | 342 | 343 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 550 | 343 | 344 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 551 | 344 | 345 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 552 | 345 | 346 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 553 | 346 | 347 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 554 | 347 | 271 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 555 | 278 | 285 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 556 | 285 | 292 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 557 | 292 | 299 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 558 | 299 | 306 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 559 | 306 | 313 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 560 | 313 | 320 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 561 | 320 | 327 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 562 | 327 | 334 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 563 | 334 | 341 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 564 | 279 | 286 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 565 | 286 | 293 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 566 | 293 | 300 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 567 | 300 | 307 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 568 | 307 | 314 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 569 | 314 | 321 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 570 | 321 | 328 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 571 | 328 | 335 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 572 | 335 | 342 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 573 | 280 | 287 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 574 | 287 | 294 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 575 | 294 | 301 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 576 | 301 | 308 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 577 | 308 | 315 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 578 | 315 | 322 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 579 | 322 | 329 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 580 | 329 | 336 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 581 | 336 | 343 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 582 | 281 | 288 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 583 | 288 | 295 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 584 | 295 | 302 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 585 | 302 | 309 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 586 | 309 | 316 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 587 | 316 | 323 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 588 | 323 | 330 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 589 | 330 | 337 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |

|     |     |     |   |   |    |    |   |        |     |        |
|-----|-----|-----|---|---|----|----|---|--------|-----|--------|
| 590 | 337 | 344 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 591 | 282 | 289 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 592 | 289 | 296 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 593 | 296 | 303 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 594 | 303 | 310 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 595 | 310 | 317 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 596 | 317 | 324 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 597 | 324 | 331 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 598 | 331 | 338 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 599 | 338 | 345 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 600 | 283 | 290 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 601 | 290 | 297 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 602 | 297 | 304 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 603 | 304 | 311 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 604 | 311 | 318 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 605 | 318 | 325 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 606 | 325 | 332 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 607 | 332 | 339 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 608 | 339 | 346 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 609 | 284 | 291 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 610 | 291 | 298 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 611 | 298 | 305 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 612 | 305 | 312 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 613 | 312 | 319 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 614 | 319 | 326 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 615 | 326 | 333 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 616 | 333 | 340 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 617 | 340 | 347 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |

T O T A L   W E I G H T S   A N D   M A S S E S

| PROP  | WEIGHT | MASS  |
|-------|--------|-------|
| 1     | .0000  | .0000 |
| 2     | .0000  | .0000 |
| 3     | .0000  | .0000 |
| 4     | .0000  | .0000 |
| 5     | .0000  | .0000 |
| 6     | .0000  | .0000 |
| 7     | .0000  | .0000 |
| 8     | .0000  | .0000 |
| 9     | .0000  | .0000 |
| 10    | .0000  | .0000 |
| 11    | .0000  | .0000 |
| 12    | .0000  | .0000 |
| 13    | .0000  | .0000 |
| 14    | .0000  | .0000 |
| 15    | .0000  | .0000 |
| 16    | .0000  | .0000 |
| 17    | .0000  | .0000 |
| 18    | .0000  | .0000 |
| 19    | .0000  | .0000 |
| 20    | .0000  | .0000 |
| TOTAL | .0000  | .0000 |

J O I N T   L O A D S

| JOINT | LOAD | FX       | FY       | FZ        | MX       | MY       | MZ       |
|-------|------|----------|----------|-----------|----------|----------|----------|
| 1     | 1    | .000E+00 | .000E+00 | -.102E+01 | .000E+00 | .000E+00 | .000E+00 |
| 9     | 1    | .000E+00 | .000E+00 | -.102E+01 | .000E+00 | .000E+00 | .000E+00 |
| 2     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 3     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 4     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 5     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 6     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 7     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 8     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 10    | 1    | .000E+00 | .000E+00 | -.151E+01 | .000E+00 | .000E+00 | .000E+00 |
| 18    | 1    | .000E+00 | .000E+00 | -.151E+01 | .000E+00 | .000E+00 | .000E+00 |
| 11    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 12    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 13    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 14    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 15    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 16    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 17    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 19    | 1    | .000E+00 | .000E+00 | -.131E+01 | .000E+00 | .000E+00 | .000E+00 |
| 28    | 1    | .000E+00 | .000E+00 | -.131E+01 | .000E+00 | .000E+00 | .000E+00 |
| 64    | 1    | .000E+00 | .000E+00 | -.131E+01 | .000E+00 | .000E+00 | .000E+00 |
| 73    | 1    | .000E+00 | .000E+00 | -.131E+01 | .000E+00 | .000E+00 | .000E+00 |

[illegible]

[illegible]

pi513.ERR

|                             |           |
|-----------------------------|-----------|
| EQUATION NUMBERING          | pi513.EQN |
| FREQUENCIES                 | pi513.EIG |
| DISPLACEMENTS AND REACTIONS | pi513.SOL |
| FRAME ELEMENT FORCES        | pi513.F3F |

## Listado Output

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E133 (513+360) TRAMO Va

E I G E N S Y S T E M P A R A M E T E R S

|                                  |   |      |
|----------------------------------|---|------|
| NUMBER OF EQUATIONS              | = | 2074 |
| NUMBER OF MASSES                 | = | 153  |
| NUMBER OF VALUES TO BE EVALUATED | = | 7    |
| SIZE OF SUBSPACE                 | = | 8    |

E133 (513+360) TRAMO Va

E I G E N V A L U E S A N D F R E Q U E N C I E S

| MODE<br>NUMBER | EIGENVALUE<br>(RAD/SEC)**2 | CIRCULAR FREQ<br>(RAD/SEC) | FREQUENCY<br>(CYCLES/SEC) | PERIOD<br>(SEC) |
|----------------|----------------------------|----------------------------|---------------------------|-----------------|
| 1              | .236567E+04                | .486382E+02                | 7.741009                  | .129182         |
| 2              | .300525E+04                | .548202E+02                | 8.724906                  | .114614         |
| 3              | .312443E+04                | .558966E+02                | 8.896225                  | .112407         |
| 4              | .465695E+05                | .215800E+03                | 34.345589                 | .029116         |
| 5              | .565215E+05                | .237742E+03                | 37.837892                 | .026429         |
| 6              | .891129E+05                | .298518E+03                | 47.510588                 | .021048         |
| 7              | .124543E+06                | .352906E+03                | 56.166731                 | .017804         |

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| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 1 -----   |      |               |           |             |       |           |         |         |
| 1         | 1    | .00           |           |             | .20   |           |         | 92.89   |
|           |      | .00           | -.24      | 11.92       |       | 7.35      | -148.78 |         |
|           |      | 106.25        | -.24      | -13.84      |       | 7.35      | 632.67  |         |
|           |      | 106.25        |           |             | .20   |           |         | 92.89   |
| 2         | 2    | .00           |           |             | .75   |           |         | 287.04  |
|           |      | .00           | -.87      | 41.71       |       | .77       | 202.71  |         |
|           |      | 106.25        | -.87      | -50.77      |       | .77       | 284.84  |         |
|           |      | 106.25        |           |             | .75   |           |         | 287.04  |
| 3         | 3    | .00           |           |             | .34   |           |         | 185.82  |
|           |      | .00           | -.48      | 22.56       |       | -.15      | 138.48  |         |
|           |      | 106.25        | -.48      | -28.12      |       | -.15      | 122.06  |         |
|           |      | 106.25        |           |             | .34   |           |         | 185.82  |
| 4 -----   |      |               |           |             |       |           |         |         |
| 1         | 1    | .00           |           |             | .54   |           |         | 18.82   |
|           |      | .00           | -.01      | -6.08       |       | 1.12      | 1747.65 |         |
|           |      | 106.25        | -.01      | -7.51       |       | 1.12      | 1866.36 |         |
|           |      | 106.25        |           |             | .54   |           |         | 18.82   |
| 2         | 2    | .00           |           |             | 1.93  |           |         | 63.20   |
|           |      | .00           | -.05      | -20.50      |       | .29       | 1077.78 |         |
|           |      | 106.25        | -.05      | -25.68      |       | .29       | 1108.48 |         |
|           |      | 106.25        |           |             | 1.93  |           |         | 63.20   |
| 3         | 3    | .00           |           |             | .93   |           |         | 42.70   |
|           |      | .00           | -.02      | -10.81      |       | .09       | 564.77  |         |
|           |      | 106.25        | -.02      | -13.14      |       | .09       | 573.96  |         |
|           |      | 106.25        |           |             | .93   |           |         | 42.70   |
| 5 -----   |      |               |           |             |       |           |         |         |
| 1         | 1    | .00           |           |             | .54   |           |         | -18.82  |
|           |      | .00           | .01       | -7.51       |       | -1.12     | 1866.36 |         |
|           |      | 106.25        | .01       | -6.08       |       | -1.12     | 1747.65 |         |
|           |      | 106.25        |           |             | .54   |           |         | -18.82  |
| 2         | 2    | .00           |           |             | 1.93  |           |         | -63.20  |
|           |      | .00           | .05       | -25.68      |       | -.29      | 1108.48 |         |
|           |      | 106.25        | .05       | -20.50      |       | -.29      | 1077.78 |         |
|           |      | 106.25        |           |             | 1.93  |           |         | -63.20  |
| 3         | 3    | .00           |           |             | .93   |           |         | -42.70  |
|           |      | .00           | .02       | -13.14      |       | -.09      | 573.96  |         |
|           |      | 106.25        | .02       | -10.81      |       | -.09      | 564.77  |         |
|           |      | 106.25        |           |             | .93   |           |         | -42.70  |
| 8 -----   |      |               |           |             |       |           |         |         |
| 1         | 1    | .00           |           |             | .20   |           |         | -92.89  |
|           |      | .00           | .24       | -13.84      |       | -7.35     | 632.67  |         |
|           |      | 106.25        | .24       | 11.92       |       | -7.35     | -148.78 |         |
|           |      | 106.25        |           |             | .20   |           |         | -92.89  |
| 2         | 2    | .00           |           |             | .75   |           |         | -287.04 |
|           |      | .00           | .87       | -50.77      |       | -.77      | 284.84  |         |
|           |      | 106.25        | .87       | 41.71       |       | -.77      | 202.71  |         |
|           |      | 106.25        |           |             | .75   |           |         | -287.04 |
| 3         | 3    | .00           |           |             | .34   |           |         | -185.82 |
|           |      | .00           | .48       | -28.12      |       | .15       | 122.06  |         |
|           |      | 106.25        | .48       | 22.56       |       | .15       | 138.48  |         |
|           |      | 106.25        |           |             | .34   |           |         | -185.82 |
| 9 -----   |      |               |           |             |       |           |         |         |
| 1         | 1    | .00           |           |             | .02   |           |         | 99.69   |
|           |      | .00           | -.55      | 26.80       |       | 14.06     | -427.77 |         |
|           |      | 106.25        | -.55      | -32.03      |       | 14.06     | 1066.07 |         |
|           |      | 106.25        |           |             | .02   |           |         | 99.69   |
| 2         | 2    | .00           |           |             | .19   |           |         | 356.16  |
|           |      | .00           | -1.75     | 85.70       |       | 8.99      | -228.56 |         |
|           |      | 106.25        | -1.75     | -100.03     |       | 8.99      | 726.90  |         |
|           |      | 106.25        |           |             | .19   |           |         | 356.16  |
| 3         | 3    | .00           |           |             | -.04  |           |         | 229.56  |
|           |      | .00           | -.88      | 44.39       |       | 4.64      | -131.22 |         |
|           |      | 106.25        | -.88      | -49.59      |       | 4.64      | 361.65  |         |
|           |      | 106.25        |           |             | -.04  |           |         | 229.56  |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 12 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .24   |           |         | 19.47   |
|           |      | .00           | -.03      | -5.19       |       | 1.90      | 2646.58 |         |
|           |      | 106.25        | -.03      | -8.27       |       | 1.90      | 2848.90 |         |
|           |      | 106.25        |           |             | .24   |           |         | 19.47   |
| 2         |      | .00           |           |             | .97   |           |         | 68.44   |
|           |      | .00           | -.11      | -17.56      |       | 1.28      | 1782.20 |         |
|           |      | 106.25        | -.11      | -28.78      |       | 1.28      | 1918.36 |         |
|           |      | 106.25        |           |             | .97   |           |         | 68.44   |
| 3         |      | .00           |           |             | .38   |           |         | 47.55   |
|           |      | .00           | -.05      | -9.26       |       | .69       | 964.75  |         |
|           |      | 106.25        | -.05      | -14.84      |       | .69       | 1038.48 |         |
|           |      | 106.25        |           |             | .38   |           |         | 47.55   |
| 13 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .24   |           |         | -19.47  |
|           |      | .00           | .03       | -8.27       |       | -1.90     | 2848.90 |         |
|           |      | 106.25        | .03       | -5.19       |       | -1.90     | 2646.58 |         |
|           |      | 106.25        |           |             | .24   |           |         | -19.47  |
| 2         |      | .00           |           |             | .97   |           |         | -68.44  |
|           |      | .00           | .11       | -28.78      |       | -1.28     | 1918.36 |         |
|           |      | 106.25        | .11       | -17.56      |       | -1.28     | 1782.20 |         |
|           |      | 106.25        |           |             | .97   |           |         | -68.44  |
| 3         |      | .00           |           |             | .38   |           |         | -47.55  |
|           |      | .00           | .05       | -14.84      |       | -.69      | 1038.48 |         |
|           |      | 106.25        | .05       | -9.26       |       | -.69      | 964.75  |         |
|           |      | 106.25        |           |             | .38   |           |         | -47.55  |
| 16 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .02   |           |         | -99.69  |
|           |      | .00           | .55       | -32.03      |       | -14.06    | 1066.07 |         |
|           |      | 106.25        | .55       | 26.80       |       | -14.06    | -427.77 |         |
|           |      | 106.25        |           |             | .02   |           |         | -99.69  |
| 2         |      | .00           |           |             | .19   |           |         | -356.16 |
|           |      | .00           | 1.75      | -100.03     |       | -8.99     | 726.90  |         |
|           |      | 106.25        | 1.75      | 85.70       |       | -8.99     | -228.56 |         |
|           |      | 106.25        |           |             | .19   |           |         | -356.16 |
| 3         |      | .00           |           |             | -.04  |           |         | -229.56 |
|           |      | .00           | .88       | -49.59      |       | -4.64     | 361.65  |         |
|           |      | 106.25        | .88       | 44.39       |       | -4.64     | -131.22 |         |
|           |      | 106.25        |           |             | -.04  |           |         | -229.56 |
| 17 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.02  |           |         | 52.12   |
|           |      | .00           | -.22      | 11.85       |       | 7.08      | -131.89 |         |
|           |      | 106.25        | -.22      | -12.00      |       | 7.08      | 620.02  |         |
|           |      | 106.25        |           |             | -.02  |           |         | 52.12   |
| 2         |      | .00           |           |             | .01   |           |         | 181.12  |
|           |      | .00           | -.80      | 42.16       |       | 4.57      | -63.94  |         |
|           |      | 106.25        | -.80      | -42.91      |       | 4.57      | 421.45  |         |
|           |      | 106.25        |           |             | .01   |           |         | 181.12  |
| 3         |      | .00           |           |             | -.06  |           |         | 130.14  |
|           |      | .00           | -.39      | 20.80       |       | 2.38      | -46.96  |         |
|           |      | 106.25        | -.39      | -21.17      |       | 2.38      | 205.71  |         |
|           |      | 106.25        |           |             | -.06  |           |         | 130.14  |
| 20 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.00  |           |         | 12.76   |
|           |      | .00           | -.02      | .30         |       | 1.25      | 1734.57 |         |
|           |      | 106.25        | -.02      | -2.05       |       | 1.25      | 1867.53 |         |
|           |      | 106.25        |           |             | -.00  |           |         | 12.76   |
| 2         |      | .00           |           |             | .09   |           |         | 45.35   |
|           |      | .00           | -.08      | 1.19        |       | .90       | 1227.89 |         |
|           |      | 106.25        | -.08      | -7.19       |       | .90       | 1323.98 |         |
|           |      | 106.25        |           |             | .09   |           |         | 45.35   |
| 3         |      | .00           |           |             | -.04  |           |         | 33.65   |
|           |      | .00           | -.04      | .62         |       | .53       | 675.38  |         |
|           |      | 106.25        | -.04      | -3.72       |       | .53       | 731.62  |         |
|           |      | 106.25        |           |             | -.04  |           |         | 33.65   |

| F R A M E |       | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|-------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD  | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND  | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 21        | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | -.00  |           |         | -12.76  |
|           |       | .00           | .02       | -2.05       |       | -1.25     | 1867.53 |         |
|           |       | 106.25        | .02       | .30         |       | -1.25     | 1734.57 |         |
|           |       | 106.25        |           |             | -.00  |           |         | -12.76  |
| 2         |       | .00           |           |             | .09   |           |         | -45.35  |
|           |       | .00           | .08       | -7.19       |       | -.90      | 1323.98 |         |
|           |       | 106.25        | .08       | 1.19        |       | -.90      | 1227.89 |         |
|           |       | 106.25        |           |             | .09   |           |         | -45.35  |
| 3         |       | .00           |           |             | -.04  |           |         | -33.65  |
|           |       | .00           | .04       | -3.72       |       | -.53      | 731.62  |         |
|           |       | 106.25        | .04       | .62         |       | -.53      | 675.38  |         |
|           |       | 106.25        |           |             | -.04  |           |         | -33.65  |
| 24        | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | -.02  |           |         | -52.12  |
|           |       | .00           | .22       | -12.00      |       | -7.08     | 620.02  |         |
|           |       | 106.25        | .22       | 11.85       |       | -7.08     | -131.89 |         |
|           |       | 106.25        |           |             | -.02  |           |         | -52.12  |
| 2         |       | .00           |           |             | .01   |           |         | -181.12 |
|           |       | .00           | .80       | -42.91      |       | -4.57     | 421.45  |         |
|           |       | 106.25        | .80       | 42.16       |       | -4.57     | -63.94  |         |
|           |       | 106.25        |           |             | .01   |           |         | -181.12 |
| 3         |       | .00           |           |             | -.06  |           |         | -130.14 |
|           |       | .00           | .39       | -21.17      |       | -2.38     | 205.71  |         |
|           |       | 106.25        | .39       | 20.80       |       | -2.38     | -46.96  |         |
|           |       | 106.25        |           |             | -.06  |           |         | -130.14 |
| 25        | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | -.03  |           |         | 76.28   |
|           |       | .00           | -.24      | 12.48       |       | 9.56      | -309.88 |         |
|           |       | 106.25        | -.24      | -12.86      |       | 9.56      | 705.45  |         |
|           |       | 106.25        |           |             | -.03  |           |         | 76.28   |
| 2         |       | .00           |           |             | -.02  |           |         | 263.81  |
|           |       | .00           | -.98      | 51.33       |       | 6.53      | -204.80 |         |
|           |       | 106.25        | -.98      | -52.57      |       | 6.53      | 488.76  |         |
|           |       | 106.25        |           |             | -.02  |           |         | 263.81  |
| 3         |       | .00           |           |             | -.10  |           |         | 167.01  |
|           |       | .00           | -.47      | 24.67       |       | 3.47      | -139.58 |         |
|           |       | 106.25        | -.47      | -25.41      |       | 3.47      | 228.60  |         |
|           |       | 106.25        |           |             | -.10  |           |         | 167.01  |
| 28        | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | -.10  |           |         | 12.14   |
|           |       | .00           | -.03      | .76         |       | 1.27      | 1755.05 |         |
|           |       | 106.25        | -.03      | -2.02       |       | 1.27      | 1890.32 |         |
|           |       | 106.25        |           |             | -.10  |           |         | 12.14   |
| 2         |       | .00           |           |             | -.26  |           |         | 43.29   |
|           |       | .00           | -.09      | 2.70        |       | .98       | 1301.14 |         |
|           |       | 106.25        | -.09      | -7.06       |       | .98       | 1405.11 |         |
|           |       | 106.25        |           |             | -.26  |           |         | 43.29   |
| 3         |       | .00           |           |             | -.22  |           |         | 39.88   |
|           |       | .00           | -.05      | 1.41        |       | 1.06      | 702.14  |         |
|           |       | 106.25        | -.05      | -3.65       |       | 1.06      | 815.20  |         |
|           |       | 106.25        |           |             | -.22  |           |         | 39.88   |
| 29        | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | -.10  |           |         | -12.14  |
|           |       | .00           | .03       | -2.02       |       | -1.27     | 1890.32 |         |
|           |       | 106.25        | .03       | .76         |       | -1.27     | 1755.05 |         |
|           |       | 106.25        |           |             | -.10  |           |         | -12.14  |
| 2         |       | .00           |           |             | -.26  |           |         | -43.29  |
|           |       | .00           | .09       | -7.06       |       | -.98      | 1405.11 |         |
|           |       | 106.25        | .09       | 2.70        |       | -.98      | 1301.14 |         |
|           |       | 106.25        |           |             | -.26  |           |         | -43.29  |
| 3         |       | .00           |           |             | -.22  |           |         | -39.88  |
|           |       | .00           | .05       | -3.65       |       | -1.06     | 815.20  |         |
|           |       | 106.25        | .05       | 1.41        |       | -1.06     | 702.14  |         |
|           |       | 106.25        |           |             | -.22  |           |         | -39.88  |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 32 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.03  |           |         | -76.28  |
|           |      | .00           | .24       | -12.86      |       | -9.56     | 705.45  |         |
|           |      | 106.25        | .24       | 12.48       |       | -9.56     | -309.88 |         |
|           |      | 106.25        |           |             | -.03  |           |         | -76.28  |
| 2         |      | .00           |           |             | -.02  |           |         | -263.81 |
|           |      | .00           | .98       | -52.57      |       | -6.53     | 488.76  |         |
|           |      | 106.25        | .98       | 51.33       |       | -6.53     | -204.80 |         |
|           |      | 106.25        |           |             | -.02  |           |         | -263.81 |
| 3         |      | .00           |           |             | -.10  |           |         | -167.01 |
|           |      | .00           | .47       | -25.41      |       | -3.47     | 228.60  |         |
|           |      | 106.25        | .47       | 24.67       |       | -3.47     | -139.58 |         |
|           |      | 106.25        |           |             | -.10  |           |         | -167.01 |
| 33 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.10  |           |         | 48.90   |
|           |      | .00           | -.27      | 13.99       |       | 10.25     | -350.66 |         |
|           |      | 106.25        | -.27      | -14.57      |       | 10.25     | 737.92  |         |
|           |      | 106.25        |           |             | -.10  |           |         | 48.90   |
| 2         |      | .00           |           |             | -.24  |           |         | 215.20  |
|           |      | .00           | -.89      | 46.74       |       | 9.65      | -384.97 |         |
|           |      | 106.25        | -.89      | -47.76      |       | 9.65      | 640.49  |         |
|           |      | 106.25        |           |             | -.24  |           |         | 215.20  |
| 3         |      | .00           |           |             | -.22  |           |         | 134.69  |
|           |      | .00           | -.44      | 23.32       |       | 4.75      | -230.06 |         |
|           |      | 106.25        | -.44      | -23.42      |       | 4.75      | 274.19  |         |
|           |      | 106.25        |           |             | -.22  |           |         | 134.69  |
| 36 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.17  |           |         | 10.60   |
|           |      | .00           | -.02      | .88         |       | 1.29      | 1773.79 |         |
|           |      | 106.25        | -.02      | -1.77       |       | 1.29      | 1911.15 |         |
|           |      | 106.25        |           |             | -.17  |           |         | 10.60   |
| 2         |      | .00           |           |             | -.49  |           |         | 37.20   |
|           |      | .00           | -.09      | 3.02        |       | 1.04      | 1367.70 |         |
|           |      | 106.25        | -.09      | -6.18       |       | 1.04      | 1478.73 |         |
|           |      | 106.25        |           |             | -.49  |           |         | 37.20   |
| 3         |      | .00           |           |             | -.33  |           |         | 28.09   |
|           |      | .00           | -.04      | 1.54        |       | 2.16      | 694.37  |         |
|           |      | 106.25        | -.04      | -3.17       |       | 2.16      | 923.35  |         |
|           |      | 106.25        |           |             | -.33  |           |         | 28.09   |
| 37 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.17  |           |         | -10.60  |
|           |      | .00           | .02       | -1.77       |       | -1.29     | 1911.15 |         |
|           |      | 106.25        | .02       | .88         |       | -1.29     | 1773.79 |         |
|           |      | 106.25        |           |             | -.17  |           |         | -10.60  |
| 2         |      | .00           |           |             | -.49  |           |         | -37.20  |
|           |      | .00           | .09       | -6.18       |       | -1.04     | 1478.73 |         |
|           |      | 106.25        | .09       | 3.02        |       | -1.04     | 1367.70 |         |
|           |      | 106.25        |           |             | -.49  |           |         | -37.20  |
| 3         |      | .00           |           |             | -.33  |           |         | -28.09  |
|           |      | .00           | .04       | -3.17       |       | -2.16     | 923.35  |         |
|           |      | 106.25        | .04       | 1.54        |       | -2.16     | 694.37  |         |
|           |      | 106.25        |           |             | -.33  |           |         | -28.09  |
| 40 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.10  |           |         | -48.90  |
|           |      | .00           | .27       | -14.57      |       | -10.25    | 737.92  |         |
|           |      | 106.25        | .27       | 13.99       |       | -10.25    | -350.66 |         |
|           |      | 106.25        |           |             | -.10  |           |         | -48.90  |
| 2         |      | .00           |           |             | -.24  |           |         | -215.20 |
|           |      | .00           | .89       | -47.76      |       | -9.65     | 640.49  |         |
|           |      | 106.25        | .89       | 46.74       |       | -9.65     | -384.97 |         |
|           |      | 106.25        |           |             | -.24  |           |         | -215.20 |
| 3         |      | .00           |           |             | -.22  |           |         | -134.69 |
|           |      | .00           | .44       | -23.42      |       | -4.75     | 274.19  |         |
|           |      | 106.25        | .44       | 23.32       |       | -4.75     | -230.06 |         |
|           |      | 106.25        |           |             | -.22  |           |         | -134.69 |

| F R A M E |       | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|-------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD  | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND  | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 41        | ----- |               |           |             |       |           |         |         |
| 1         | 1     | .00           |           |             | -.10  |           |         | 31.98   |
|           |       | .00           | -.16      | 8.52        |       | 7.69      | -169.51 |         |
|           |       | 106.25        | -.16      | -8.54       |       | 7.69      | 648.07  |         |
|           |       | 106.25        |           |             | -.10  |           |         | 31.98   |
| 2         | 2     | .00           |           |             | -.24  |           |         | 102.87  |
|           |       | .00           | -.59      | 31.09       |       | 7.79      | -249.16 |         |
|           |       | 106.25        | -.59      | -31.23      |       | 7.79      | 578.05  |         |
|           |       | 106.25        |           |             | -.24  |           |         | 102.87  |
| 3         | 3     | .00           |           |             | -.19  |           |         | 74.30   |
|           |       | .00           | -.30      | 15.66       |       | 3.68      | -151.32 |         |
|           |       | 106.25        | -.30      | -15.76      |       | 3.68      | 239.17  |         |
|           |       | 106.25        |           |             | -.19  |           |         | 74.30   |
| 44        | ----- |               |           |             |       |           |         |         |
| 1         | 1     | .00           |           |             | -.21  |           |         | 8.41    |
|           |       | .00           | -.02      | .81         |       | 1.31      | 1789.55 |         |
|           |       | 106.25        | -.02      | -1.40       |       | 1.31      | 1928.54 |         |
|           |       | 106.25        |           |             | -.21  |           |         | 8.41    |
| 2         | 2     | .00           |           |             | -.64  |           |         | 28.05   |
|           |       | .00           | -.07      | 2.73        |       | 1.10      | 1421.61 |         |
|           |       | 106.25        | -.07      | -4.90       |       | 1.10      | 1538.40 |         |
|           |       | 106.25        |           |             | -.64  |           |         | 28.05   |
| 3         | 3     | .00           |           |             | -.41  |           |         | 19.81   |
|           |       | .00           | -.04      | 1.34        |       | 1.69      | 759.42  |         |
|           |       | 106.25        | -.04      | -2.48       |       | 1.69      | 939.02  |         |
|           |       | 106.25        |           |             | -.41  |           |         | 19.81   |
| 45        | ----- |               |           |             |       |           |         |         |
| 1         | 1     | .00           |           |             | -.21  |           |         | -8.41   |
|           |       | .00           | .02       | -1.40       |       | -1.31     | 1928.54 |         |
|           |       | 106.25        | .02       | .81         |       | -1.31     | 1789.55 |         |
|           |       | 106.25        |           |             | -.21  |           |         | -8.41   |
| 2         | 2     | .00           |           |             | -.64  |           |         | -28.05  |
|           |       | .00           | .07       | -4.90       |       | -1.10     | 1538.40 |         |
|           |       | 106.25        | .07       | 2.73        |       | -1.10     | 1421.61 |         |
|           |       | 106.25        |           |             | -.64  |           |         | -28.05  |
| 3         | 3     | .00           |           |             | -.41  |           |         | -19.81  |
|           |       | .00           | .04       | -2.48       |       | -1.69     | 939.02  |         |
|           |       | 106.25        | .04       | 1.34        |       | -1.69     | 759.42  |         |
|           |       | 106.25        |           |             | -.41  |           |         | -19.81  |
| 48        | ----- |               |           |             |       |           |         |         |
| 1         | 1     | .00           |           |             | -.10  |           |         | -31.98  |
|           |       | .00           | .16       | -8.54       |       | -7.69     | 648.07  |         |
|           |       | 106.25        | .16       | 8.52        |       | -7.69     | -169.51 |         |
|           |       | 106.25        |           |             | -.10  |           |         | -31.98  |
| 2         | 2     | .00           |           |             | -.24  |           |         | -102.87 |
|           |       | .00           | .59       | -31.23      |       | -7.79     | 578.05  |         |
|           |       | 106.25        | .59       | 31.09       |       | -7.79     | -249.16 |         |
|           |       | 106.25        |           |             | -.24  |           |         | -102.87 |
| 3         | 3     | .00           |           |             | -.19  |           |         | -74.30  |
|           |       | .00           | .30       | -15.76      |       | -3.68     | 239.17  |         |
|           |       | 106.25        | .30       | 15.66       |       | -3.68     | -151.32 |         |
|           |       | 106.25        |           |             | -.19  |           |         | -74.30  |
| 49        | ----- |               |           |             |       |           |         |         |
| 1         | 1     | .00           |           |             | -.10  |           |         | 36.90   |
|           |       | .00           | -.09      | 4.73        |       | 10.15     | -345.59 |         |
|           |       | 106.25        | -.09      | -4.34       |       | 10.15     | 732.75  |         |
|           |       | 106.25        |           |             | -.10  |           |         | 36.90   |
| 2         | 2     | .00           |           |             | -.26  |           |         | 73.57   |
|           |       | .00           | -.41      | 21.52       |       | 9.17      | -359.80 |         |
|           |       | 106.25        | -.41      | -21.55      |       | 9.17      | 615.04  |         |
|           |       | 106.25        |           |             | -.26  |           |         | 73.57   |
| 3         | 3     | .00           |           |             | -.23  |           |         | 56.31   |
|           |       | .00           | -.21      | 11.10       |       | 4.59      | -224.17 |         |
|           |       | 106.25        | -.21      | -11.57      |       | 4.59      | 263.67  |         |
|           |       | 106.25        |           |             | -.23  |           |         | 56.31   |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |        |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|--------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL  |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ   |
| 52 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.23  |           |         | 5.89   |
|           |      | .00           | -.01      | .62         |       | 1.32      | 1801.12 |        |
|           |      | 106.25        | -.01      | -.95        |       | 1.32      | 1941.69 |        |
|           |      | 106.25        |           |             | -.23  |           |         | 5.89   |
| 2         |      | .00           |           |             | -.73  |           |         | 18.13  |
|           |      | .00           | -.05      | 2.04        |       | 1.15      | 1459.13 |        |
|           |      | 106.25        | -.05      | -3.36       |       | 1.15      | 1580.85 |        |
|           |      | 106.25        |           |             | -.73  |           |         | 18.13  |
| 3         |      | .00           |           |             | -.46  |           |         | 10.95  |
|           |      | .00           | -.02      | .95         |       | 2.23      | 758.90  |        |
|           |      | 106.25        | -.02      | -1.67       |       | 2.23      | 995.50  |        |
|           |      | 106.25        |           |             | -.46  |           |         | 10.95  |
| 53 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.23  |           |         | -5.89  |
|           |      | .00           | .01       | -.95        |       | -1.32     | 1941.69 |        |
|           |      | 106.25        | .01       | .62         |       | -1.32     | 1801.12 |        |
|           |      | 106.25        |           |             | -.23  |           |         | -5.89  |
| 2         |      | .00           |           |             | -.73  |           |         | -18.13 |
|           |      | .00           | .05       | -3.36       |       | -1.15     | 1580.85 |        |
|           |      | 106.25        | .05       | 2.04        |       | -1.15     | 1459.13 |        |
|           |      | 106.25        |           |             | -.73  |           |         | -18.13 |
| 3         |      | .00           |           |             | -.46  |           |         | -10.95 |
|           |      | .00           | .02       | -1.67       |       | -2.23     | 995.50  |        |
|           |      | 106.25        | .02       | .95         |       | -2.23     | 758.90  |        |
|           |      | 106.25        |           |             | -.46  |           |         | -10.95 |
| 56 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.10  |           |         | -36.90 |
|           |      | .00           | .09       | -4.34       |       | -10.15    | 732.75  |        |
|           |      | 106.25        | .09       | 4.73        |       | -10.15    | -345.59 |        |
|           |      | 106.25        |           |             | -.10  |           |         | -36.90 |
| 2         |      | .00           |           |             | -.26  |           |         | -73.57 |
|           |      | .00           | .41       | -21.55      |       | -9.17     | 615.04  |        |
|           |      | 106.25        | .41       | 21.52       |       | -9.17     | -359.80 |        |
|           |      | 106.25        |           |             | -.26  |           |         | -73.57 |
| 3         |      | .00           |           |             | -.23  |           |         | -56.31 |
|           |      | .00           | .21       | -11.57      |       | -4.59     | 263.67  |        |
|           |      | 106.25        | .21       | 11.10       |       | -4.59     | -224.17 |        |
|           |      | 106.25        |           |             | -.23  |           |         | -56.31 |
| 57 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.09  |           |         | 5.56   |
|           |      | .00           | -.09      | 4.68        |       | 10.25     | -351.16 |        |
|           |      | 106.25        | -.09      | -4.37       |       | 10.25     | 738.42  |        |
|           |      | 106.25        |           |             | -.09  |           |         | 5.56   |
| 2         |      | .00           |           |             | -.27  |           |         | 14.75  |
|           |      | .00           | -.20      | 11.12       |       | 8.86      | -341.80 |        |
|           |      | 106.25        | -.20      | -10.51      |       | 8.86      | 599.37  |        |
|           |      | 106.25        |           |             | -.27  |           |         | 14.75  |
| 3         |      | .00           |           |             | -.26  |           |         | 16.19  |
|           |      | .00           | -.12      | 6.41        |       | 4.88      | -228.79 |        |
|           |      | 106.25        | -.12      | -5.87       |       | 4.88      | 290.01  |        |
|           |      | 106.25        |           |             | -.26  |           |         | 16.19  |
| 60 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.24  |           |         | 3.23   |
|           |      | .00           | -.01      | .33         |       | 1.33      | 1808.57 |        |
|           |      | 106.25        | -.01      | -.45        |       | 1.33      | 1950.06 |        |
|           |      | 106.25        |           |             | -.24  |           |         | 3.23   |
| 2         |      | .00           |           |             | -.77  |           |         | 9.09   |
|           |      | .00           | -.02      | 1.04        |       | 1.18      | 1480.92 |        |
|           |      | 106.25        | -.02      | -1.60       |       | 1.18      | 1605.95 |        |
|           |      | 106.25        |           |             | -.77  |           |         | 9.09   |
| 3         |      | .00           |           |             | -.49  |           |         | -2.89  |
|           |      | .00           | -.01      | .46         |       | 1.19      | 830.07  |        |
|           |      | 106.25        | -.01      | -.78        |       | 1.19      | 956.49  |        |
|           |      | 106.25        |           |             | -.49  |           |         | -2.89  |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |        |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|--------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL  |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ   |
| 61 -----  |      |               |           |             |       |           |         |        |
| 1         | .00  |               |           |             | -.24  |           |         | -3.23  |
|           |      | .00           | .01       | -.45        |       | -1.33     | 1950.06 |        |
|           |      | 106.25        | .01       | .33         |       | -1.33     | 1808.57 |        |
|           |      | 106.25        |           |             | -.24  |           |         | -3.23  |
| 2         | .00  |               |           |             | -.77  |           |         | -9.09  |
|           |      | .00           | .02       | -1.60       |       | -1.18     | 1605.95 |        |
|           |      | 106.25        | .02       | 1.04        |       | -1.18     | 1480.92 |        |
|           |      | 106.25        |           |             | -.77  |           |         | -9.09  |
| 3         | .00  |               |           |             | -.49  |           |         | 2.89   |
|           |      | .00           | .01       | -.78        |       | -1.19     | 956.49  |        |
|           |      | 106.25        | .01       | .46         |       | -1.19     | 830.07  |        |
|           |      | 106.25        |           |             | -.49  |           |         | 2.89   |
| 64 -----  |      |               |           |             |       |           |         |        |
| 1         | .00  |               |           |             | -.09  |           |         | -5.56  |
|           |      | .00           | .09       | -4.37       |       | -10.25    | 738.42  |        |
|           |      | 106.25        | .09       | 4.68        |       | -10.25    | -351.16 |        |
|           |      | 106.25        |           |             | -.09  |           |         | -5.56  |
| 2         | .00  |               |           |             | -.27  |           |         | -14.75 |
|           |      | .00           | .20       | -10.51      |       | -8.86     | 599.37  |        |
|           |      | 106.25        | .20       | 11.12       |       | -8.86     | -341.80 |        |
|           |      | 106.25        |           |             | -.27  |           |         | -14.75 |
| 3         | .00  |               |           |             | -.26  |           |         | -16.19 |
|           |      | .00           | .12       | -5.87       |       | -4.88     | 290.01  |        |
|           |      | 106.25        | .12       | 6.41        |       | -4.88     | -228.79 |        |
|           |      | 106.25        |           |             | -.26  |           |         | -16.19 |
| 65 -----  |      |               |           |             |       |           |         |        |
| 1         | .00  |               |           |             | -.07  |           |         | 4.41   |
|           |      | .00           | .02       | -.99        |       | 7.70      | -168.56 |        |
|           |      | 106.25        | .02       | 1.03        |       | 7.70      | 649.56  |        |
|           |      | 106.25        |           |             | -.07  |           |         | 4.41   |
| 2         | .00  |               |           |             | -.23  |           |         | 7.64   |
|           |      | .00           | .03       | -1.84       |       | 6.41      | -169.77 |        |
|           |      | 106.25        | .03       | 1.88        |       | 6.41      | 510.84  |        |
|           |      | 106.25        |           |             | -.23  |           |         | 7.64   |
| 3         | .00  |               |           |             | -.20  |           |         | 4.82   |
|           |      | .00           | .02       | -.96        |       | 3.59      | -127.86 |        |
|           |      | 106.25        | .02       | .98         |       | 3.59      | 254.09  |        |
|           |      | 106.25        |           |             | -.20  |           |         | 4.82   |
| 68 -----  |      |               |           |             |       |           |         |        |
| 1         | .00  |               |           |             | -.24  |           |         | .61    |
|           |      | .00           | .00       | -.01        |       | 1.33      | 1811.87 |        |
|           |      | 106.25        | .00       | .09         |       | 1.33      | 1953.53 |        |
|           |      | 106.25        |           |             | -.24  |           |         | .61    |
| 2         | .00  |               |           |             | -.78  |           |         | 1.20   |
|           |      | .00           | .00       | -.15        |       | 1.19      | 1489.25 |        |
|           |      | 106.25        | .00       | .27         |       | 1.19      | 1615.39 |        |
|           |      | 106.25        |           |             | -.78  |           |         | 1.20   |
| 3         | .00  |               |           |             | -.50  |           |         | .82    |
|           |      | .00           | .00       | -.08        |       | .74       | 859.77  |        |
|           |      | 106.25        | .00       | .14         |       | .74       | 938.84  |        |
|           |      | 106.25        |           |             | -.50  |           |         | .82    |
| 69 -----  |      |               |           |             |       |           |         |        |
| 1         | .00  |               |           |             | -.24  |           |         | -.61   |
|           |      | .00           | -.00      | .09         |       | -1.33     | 1953.53 |        |
|           |      | 106.25        | -.00      | -.01        |       | -1.33     | 1811.87 |        |
|           |      | 106.25        |           |             | -.24  |           |         | -.61   |
| 2         | .00  |               |           |             | -.78  |           |         | -1.20  |
|           |      | .00           | -.00      | .27         |       | -1.19     | 1615.39 |        |
|           |      | 106.25        | -.00      | -.15        |       | -1.19     | 1489.25 |        |
|           |      | 106.25        |           |             | -.78  |           |         | -1.20  |
| 3         | .00  |               |           |             | -.50  |           |         | -.82   |
|           |      | .00           | -.00      | .14         |       | -.74      | 938.84  |        |
|           |      | 106.25        | -.00      | -.08        |       | -.74      | 859.77  |        |
|           |      | 106.25        |           |             | -.50  |           |         | -.82   |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |       |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|-------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ  |
| 72 -----  |      |               |           |             |       |           |         |       |
| 1         |      | .00           |           |             | -.07  |           |         | -4.41 |
|           |      | .00           | -.02      | 1.03        |       | -7.70     | 649.56  |       |
|           |      | 106.25        | -.02      | -.99        |       | -7.70     | -168.56 |       |
|           |      | 106.25        |           |             | -.07  |           |         | -4.41 |
| 2         |      | .00           |           |             | -.23  |           |         | -7.64 |
|           |      | .00           | -.03      | 1.88        |       | -6.41     | 510.84  |       |
|           |      | 106.25        | -.03      | -1.84       |       | -6.41     | -169.77 |       |
|           |      | 106.25        |           |             | -.23  |           |         | -7.64 |
| 3         |      | .00           |           |             | -.20  |           |         | -4.82 |
|           |      | .00           | -.02      | .98         |       | -3.59     | 254.09  |       |
|           |      | 106.25        | -.02      | -.96        |       | -3.59     | -127.86 |       |
|           |      | 106.25        |           |             | -.20  |           |         | -4.82 |
| 73 -----  |      |               |           |             |       |           |         |       |
| 1         |      | .00           |           |             | -.08  |           |         | -.82  |
|           |      | .00           | .13       | -6.85       |       | 10.32     | -353.74 |       |
|           |      | 106.25        | .13       | 6.72        |       | 10.32     | 742.40  |       |
|           |      | 106.25        |           |             | -.08  |           |         | -.82  |
| 2         |      | .00           |           |             | -.26  |           |         | -5.16 |
|           |      | .00           | .28       | -15.10      |       | 8.95      | -345.38 |       |
|           |      | 106.25        | .28       | 14.72       |       | 8.95      | 605.06  |       |
|           |      | 106.25        |           |             | -.26  |           |         | -5.16 |
| 3         |      | .00           |           |             | -.25  |           |         | -9.44 |
|           |      | .00           | .16       | -8.50       |       | 4.93      | -230.63 |       |
|           |      | 106.25        | .16       | 8.08        |       | 4.93      | 293.05  |       |
|           |      | 106.25        |           |             | -.25  |           |         | -9.44 |
| 76 -----  |      |               |           |             |       |           |         |       |
| 1         |      | .00           |           |             | -.23  |           |         | -2.04 |
|           |      | .00           | .01       | -.36        |       | 1.33      | 1810.60 |       |
|           |      | 106.25        | .01       | .63         |       | 1.33      | 1952.24 |       |
|           |      | 106.25        |           |             | -.23  |           |         | -2.04 |
| 2         |      | .00           |           |             | -.76  |           |         | -6.73 |
|           |      | .00           | .03       | -1.33       |       | 1.18      | 1484.90 |       |
|           |      | 106.25        | .03       | 2.14        |       | 1.18      | 1610.25 |       |
|           |      | 106.25        |           |             | -.76  |           |         | -6.73 |
| 3         |      | .00           |           |             | -.48  |           |         | 4.51  |
|           |      | .00           | .02       | -.62        |       | 1.19      | 832.80  |       |
|           |      | 106.25        | .02       | 1.06        |       | 1.19      | 959.44  |       |
|           |      | 106.25        |           |             | -.48  |           |         | 4.51  |
| 77 -----  |      |               |           |             |       |           |         |       |
| 1         |      | .00           |           |             | -.23  |           |         | 2.04  |
|           |      | .00           | -.01      | .63         |       | -1.33     | 1952.24 |       |
|           |      | 106.25        | -.01      | -.36        |       | -1.33     | 1810.60 |       |
|           |      | 106.25        |           |             | -.23  |           |         | 2.04  |
| 2         |      | .00           |           |             | -.76  |           |         | 6.73  |
|           |      | .00           | -.03      | 2.14        |       | -1.18     | 1610.25 |       |
|           |      | 106.25        | -.03      | -1.33       |       | -1.18     | 1484.90 |       |
|           |      | 106.25        |           |             | -.76  |           |         | 6.73  |
| 3         |      | .00           |           |             | -.48  |           |         | -4.51 |
|           |      | .00           | -.02      | 1.06        |       | -1.19     | 959.44  |       |
|           |      | 106.25        | -.02      | -.62        |       | -1.19     | 832.80  |       |
|           |      | 106.25        |           |             | -.48  |           |         | -4.51 |
| 80 -----  |      |               |           |             |       |           |         |       |
| 1         |      | .00           |           |             | -.08  |           |         | .82   |
|           |      | .00           | -.13      | 6.72        |       | -10.32    | 742.40  |       |
|           |      | 106.25        | -.13      | -6.85       |       | -10.32    | -353.74 |       |
|           |      | 106.25        |           |             | -.08  |           |         | .82   |
| 2         |      | .00           |           |             | -.26  |           |         | 5.16  |
|           |      | .00           | -.28      | 14.72       |       | -8.95     | 605.06  |       |
|           |      | 106.25        | -.28      | -15.10      |       | -8.95     | -345.38 |       |
|           |      | 106.25        |           |             | -.26  |           |         | 5.16  |
| 3         |      | .00           |           |             | -.25  |           |         | 9.44  |
|           |      | .00           | -.16      | 8.08        |       | -4.93     | 293.05  |       |
|           |      | 106.25        | -.16      | -8.50       |       | -4.93     | -230.63 |       |
|           |      | 106.25        |           |             | -.25  |           |         | 9.44  |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |        |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|--------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL  |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ   |
| 81 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.09  |           |         | -32.58 |
|           |      | .00           | .12       | -6.47       |       | 10.15     | -344.70 |        |
|           |      | 106.25        | .12       | 6.20        |       | 10.15     | 734.07  |        |
|           |      | 106.25        |           |             | -.09  |           |         | -32.58 |
| 2         |      | .00           |           |             | -.25  |           |         | -64.46 |
|           |      | .00           | .47       | -25.04      |       | 9.18      | -358.76 |        |
|           |      | 106.25        | .47       | 25.22       |       | 9.18      | 617.10  |        |
|           |      | 106.25        |           |             | -.25  |           |         | -64.46 |
| 3         |      | .00           |           |             | -.23  |           |         | -49.73 |
|           |      | .00           | .25       | -12.95      |       | 4.60      | -223.87 |        |
|           |      | 106.25        | .25       | 13.51       |       | 4.60      | 265.05  |        |
|           |      | 106.25        |           |             | -.23  |           |         | -49.73 |
| 84 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.21  |           |         | -4.77  |
|           |      | .00           | .02       | -.65        |       | 1.33      | 1805.10 |        |
|           |      | 106.25        | .02       | 1.12        |       | 1.33      | 1945.95 |        |
|           |      | 106.25        |           |             | -.21  |           |         | -4.77  |
| 2         |      | .00           |           |             | -.70  |           |         | -15.88 |
|           |      | .00           | .06       | -2.31       |       | 1.15      | 1466.98 |        |
|           |      | 106.25        | .06       | 3.87        |       | 1.15      | 1589.32 |        |
|           |      | 106.25        |           |             | -.70  |           |         | -15.88 |
| 3         |      | .00           |           |             | -.45  |           |         | -9.37  |
|           |      | .00           | .03       | -1.09       |       | 2.23      | 764.31  |        |
|           |      | 106.25        | .03       | 1.94        |       | 2.23      | 1001.34 |        |
|           |      | 106.25        |           |             | -.45  |           |         | -9.37  |
| 85 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.21  |           |         | 4.77   |
|           |      | .00           | -.02      | 1.12        |       | -1.33     | 1945.95 |        |
|           |      | 106.25        | -.02      | -.65        |       | -1.33     | 1805.10 |        |
|           |      | 106.25        |           |             | -.21  |           |         | 4.77   |
| 2         |      | .00           |           |             | -.70  |           |         | 15.88  |
|           |      | .00           | -.06      | 3.87        |       | -1.15     | 1589.32 |        |
|           |      | 106.25        | -.06      | -2.31       |       | -1.15     | 1466.98 |        |
|           |      | 106.25        |           |             | -.70  |           |         | 15.88  |
| 3         |      | .00           |           |             | -.45  |           |         | 9.37   |
|           |      | .00           | -.03      | 1.94        |       | -2.23     | 1001.34 |        |
|           |      | 106.25        | -.03      | -1.09       |       | -2.23     | 764.31  |        |
|           |      | 106.25        |           |             | -.45  |           |         | 9.37   |
| 88 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.09  |           |         | 32.58  |
|           |      | .00           | -.12      | 6.20        |       | -10.15    | 734.07  |        |
|           |      | 106.25        | -.12      | -6.47       |       | -10.15    | -344.70 |        |
|           |      | 106.25        |           |             | -.09  |           |         | 32.58  |
| 2         |      | .00           |           |             | -.25  |           |         | 64.46  |
|           |      | .00           | -.47      | 25.22       |       | -9.18     | 617.10  |        |
|           |      | 106.25        | -.47      | -25.04      |       | -9.18     | -358.76 |        |
|           |      | 106.25        |           |             | -.25  |           |         | 64.46  |
| 3         |      | .00           |           |             | -.23  |           |         | 49.73  |
|           |      | .00           | -.25      | 13.51       |       | -4.60     | 265.05  |        |
|           |      | 106.25        | -.25      | -12.95      |       | -4.60     | -223.87 |        |
|           |      | 106.25        |           |             | -.23  |           |         | 49.73  |
| 89 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.09  |           |         | -25.46 |
|           |      | .00           | .18       | -9.68       |       | 7.72      | -169.04 |        |
|           |      | 106.25        | .18       | 9.75        |       | 7.72      | 651.05  |        |
|           |      | 106.25        |           |             | -.09  |           |         | -25.46 |
| 2         |      | .00           |           |             | -.23  |           |         | -90.07 |
|           |      | .00           | .64       | -33.83      |       | 7.84      | -249.20 |        |
|           |      | 106.25        | .64       | 34.04       |       | 7.84      | 583.29  |        |
|           |      | 106.25        |           |             | -.23  |           |         | -90.07 |
| 3         |      | .00           |           |             | -.18  |           |         | -65.66 |
|           |      | .00           | .32       | -17.12      |       | 3.71      | -151.48 |        |
|           |      | 106.25        | .32       | 17.26       |       | 3.71      | 242.33  |        |
|           |      | 106.25        |           |             | -.18  |           |         | -65.66 |

C S I / S A P 9 0 - - FINITE ELEMENT ANALYSIS OF STRUCTURES PAGE 11  
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| F R A M E |        | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|--------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD   | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND   | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 92        | -----  |               |           |             |       |           |         |         |
| 1         | .00    |               |           |             | -.18  |           |         | -7.39   |
|           | .00    |               | .02       | -.83        |       | 1.31      | 1795.34 |         |
|           | 106.25 |               | .02       | 1.54        |       | 1.31      | 1934.72 |         |
|           | 106.25 |               |           |             | -.18  |           |         | -7.39   |
| 2         | .00    |               |           |             | -.60  |           |         | -25.95  |
|           | .00    |               | .08       | -2.93       |       | 1.11      | 1433.12 |         |
|           | 106.25 |               | .08       | 5.37        |       | 1.11      | 1550.81 |         |
|           | 106.25 |               |           |             | -.60  |           |         | -25.95  |
| 3         | .00    |               |           |             | -.39  |           |         | -18.27  |
|           | .00    |               | .04       | -1.44       |       | 1.70      | 767.44  |         |
|           | 106.25 |               | .04       | 2.72        |       | 1.70      | 947.68  |         |
|           | 106.25 |               |           |             | -.39  |           |         | -18.27  |
| 93        | -----  |               |           |             |       |           |         |         |
| 1         | .00    |               |           |             | -.18  |           |         | 7.39    |
|           | .00    |               | -.02      | 1.54        |       | -1.31     | 1934.72 |         |
|           | 106.25 |               | -.02      | -.83        |       | -1.31     | 1795.34 |         |
|           | 106.25 |               |           |             | -.18  |           |         | 7.39    |
| 2         | .00    |               |           |             | -.60  |           |         | 25.95   |
|           | .00    |               | -.08      | 5.37        |       | -1.11     | 1550.81 |         |
|           | 106.25 |               | -.08      | -2.93       |       | -1.11     | 1433.12 |         |
|           | 106.25 |               |           |             | -.60  |           |         | 25.95   |
| 3         | .00    |               |           |             | -.39  |           |         | 18.27   |
|           | .00    |               | -.04      | 2.72        |       | -1.70     | 947.68  |         |
|           | 106.25 |               | -.04      | -1.44       |       | -1.70     | 767.44  |         |
|           | 106.25 |               |           |             | -.39  |           |         | 18.27   |
| 96        | -----  |               |           |             |       |           |         |         |
| 1         | .00    |               |           |             | -.09  |           |         | 25.46   |
|           | .00    |               | -.18      | 9.75        |       | -7.72     | 651.05  |         |
|           | 106.25 |               | -.18      | -9.68       |       | -7.72     | -169.04 |         |
|           | 106.25 |               |           |             | -.09  |           |         | 25.46   |
| 2         | .00    |               |           |             | -.23  |           |         | 90.07   |
|           | .00    |               | -.64      | 34.04       |       | -7.84     | 583.29  |         |
|           | 106.25 |               | -.64      | -33.83      |       | -7.84     | -249.20 |         |
|           | 106.25 |               |           |             | -.23  |           |         | 90.07   |
| 3         | .00    |               |           |             | -.18  |           |         | 65.66   |
|           | .00    |               | -.32      | 17.26       |       | -3.71     | 242.33  |         |
|           | 106.25 |               | -.32      | -17.12      |       | -3.71     | -151.48 |         |
|           | 106.25 |               |           |             | -.18  |           |         | 65.66   |
| 97        | -----  |               |           |             |       |           |         |         |
| 1         | .00    |               |           |             | -.08  |           |         | -44.28  |
|           | .00    |               | .28       | -14.68      |       | 10.31     | -351.17 |         |
|           | 106.25 |               | .28       | 15.41       |       | 10.31     | 743.77  |         |
|           | 106.25 |               |           |             | -.08  |           |         | -44.28  |
| 2         | .00    |               |           |             | -.22  |           |         | -205.95 |
|           | .00    |               | .93       | -48.99      |       | 9.78      | -387.82 |         |
|           | 106.25 |               | .93       | 50.22       |       | 9.78      | 651.02  |         |
|           | 106.25 |               |           |             | -.22  |           |         | -205.95 |
| 3         | .00    |               |           |             | -.21  |           |         | -127.84 |
|           | .00    |               | .46       | -24.56      |       | 4.82      | -232.10 |         |
|           | 106.25 |               | .46       | 24.77       |       | 4.82      | 280.42  |         |
|           | 106.25 |               |           |             | -.21  |           |         | -127.84 |
| 100       | -----  |               |           |             |       |           |         |         |
| 1         | .00    |               |           |             | -.13  |           |         | -9.69   |
|           | .00    |               | .03       | -.89        |       | 1.30      | 1781.21 |         |
|           | 106.25 |               | .03       | 1.87        |       | 1.30      | 1919.06 |         |
|           | 106.25 |               |           |             | -.13  |           |         | -9.69   |
| 2         | .00    |               |           |             | -.43  |           |         | -35.30  |
|           | .00    |               | .09       | -3.12       |       | 1.06      | 1382.57 |         |
|           | 106.25 |               | .09       | 6.56        |       | 1.06      | 1494.74 |         |
|           | 106.25 |               |           |             | -.43  |           |         | -35.30  |
| 3         | .00    |               |           |             | -.30  |           |         | -26.64  |
|           | .00    |               | .05       | -1.58       |       | 2.16      | 704.88  |         |
|           | 106.25 |               | .05       | 3.36        |       | 2.16      | 934.72  |         |
|           | 106.25 |               |           |             | -.30  |           |         | -26.64  |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 101 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.13  |           |         | 9.69    |
|           |      | .00           | -.03      | 1.87        |       | -1.30     | 1919.06 |         |
|           |      | 106.25        | -.03      | -.89        |       | -1.30     | 1781.21 |         |
|           |      | 106.25        |           |             | -.13  |           |         | 9.69    |
| 2         |      | .00           |           |             | -.43  |           |         | 35.30   |
|           |      | .00           | -.09      | 6.56        |       | -1.06     | 1494.74 |         |
|           |      | 106.25        | -.09      | -3.12       |       | -1.06     | 1382.57 |         |
|           |      | 106.25        |           |             | -.43  |           |         | 35.30   |
| 3         |      | .00           |           |             | -.30  |           |         | 26.64   |
|           |      | .00           | -.05      | 3.36        |       | -2.16     | 934.72  |         |
|           |      | 106.25        | -.05      | -1.58       |       | -2.16     | 704.88  |         |
|           |      | 106.25        |           |             | -.30  |           |         | 26.64   |
| 104 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.08  |           |         | 44.28   |
|           |      | .00           | -.28      | 15.41       |       | -10.31    | 743.77  |         |
|           |      | 106.25        | -.28      | -14.68      |       | -10.31    | -351.17 |         |
|           |      | 106.25        |           |             | -.08  |           |         | 44.28   |
| 2         |      | .00           |           |             | -.22  |           |         | 205.95  |
|           |      | .00           | -.93      | 50.22       |       | -9.78     | 651.02  |         |
|           |      | 106.25        | -.93      | -48.99      |       | -9.78     | -387.82 |         |
|           |      | 106.25        |           |             | -.22  |           |         | 205.95  |
| 3         |      | .00           |           |             | -.21  |           |         | 127.84  |
|           |      | .00           | -.46      | 24.77       |       | -4.82     | 280.42  |         |
|           |      | 106.25        | -.46      | -24.56      |       | -4.82     | -232.10 |         |
|           |      | 106.25        |           |             | -.21  |           |         | 127.84  |
| 105 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .00   |           |         | -72.57  |
|           |      | .00           | .24       | -12.67      |       | 9.61      | -309.59 |         |
|           |      | 106.25        | .24       | 13.07       |       | 9.61      | 711.29  |         |
|           |      | 106.25        |           |             | .00   |           |         | -72.57  |
| 2         |      | .00           |           |             | .01   |           |         | -256.28 |
|           |      | .00           | 1.01      | -52.91      |       | 6.63      | -205.72 |         |
|           |      | 106.25        | 1.01      | 54.24       |       | 6.63      | 498.87  |         |
|           |      | 106.25        |           |             | .01   |           |         | -256.28 |
| 3         |      | .00           |           |             | -.08  |           |         | -160.97 |
|           |      | .00           | .49       | -25.54      |       | 3.54      | -140.96 |         |
|           |      | 106.25        | .49       | 26.35       |       | 3.54      | 234.85  |         |
|           |      | 106.25        |           |             | -.08  |           |         | -160.97 |
| 108 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.06  |           |         | -11.31  |
|           |      | .00           | .03       | -.75        |       | 1.28      | 1763.94 |         |
|           |      | 106.25        | .03       | 2.08        |       | 1.28      | 1899.79 |         |
|           |      | 106.25        |           |             | -.06  |           |         | -11.31  |
| 2         |      | .00           |           |             | -.18  |           |         | -41.60  |
|           |      | .00           | .09       | -2.65       |       | .99       | 1319.01 |         |
|           |      | 106.25        | .09       | 7.33        |       | .99       | 1424.37 |         |
|           |      | 106.25        |           |             | -.18  |           |         | -41.60  |
| 3         |      | .00           |           |             | -.17  |           |         | -38.53  |
|           |      | .00           | .05       | -1.36       |       | 1.07      | 714.98  |         |
|           |      | 106.25        | .05       | 3.77        |       | 1.07      | 829.11  |         |
|           |      | 106.25        |           |             | -.17  |           |         | -38.53  |
| 109 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.06  |           |         | 11.31   |
|           |      | .00           | -.03      | 2.08        |       | -1.28     | 1899.79 |         |
|           |      | 106.25        | -.03      | -.75        |       | -1.28     | 1763.94 |         |
|           |      | 106.25        |           |             | -.06  |           |         | 11.31   |
| 2         |      | .00           |           |             | -.18  |           |         | 41.60   |
|           |      | .00           | -.09      | 7.33        |       | -.99      | 1424.37 |         |
|           |      | 106.25        | -.09      | -2.65       |       | -.99      | 1319.01 |         |
|           |      | 106.25        |           |             | -.18  |           |         | 41.60   |
| 3         |      | .00           |           |             | -.17  |           |         | 38.53   |
|           |      | .00           | -.05      | 3.77        |       | -1.07     | 829.11  |         |
|           |      | 106.25        | -.05      | -1.36       |       | -1.07     | 714.98  |         |
|           |      | 106.25        |           |             | -.17  |           |         | 38.53   |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 112 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .00   |           |         | 72.57   |
|           |      | .00           | -.24      | 13.07       |       | -9.61     | 711.29  |         |
|           |      | 106.25        | -.24      | -12.67      |       | -9.61     | -309.59 |         |
|           |      | 106.25        |           |             | .00   |           |         | 72.57   |
| 2         |      | .00           |           |             | .01   |           |         | 256.28  |
|           |      | .00           | -1.01     | 54.24       |       | -6.63     | 498.87  |         |
|           |      | 106.25        | -1.01     | -52.91      |       | -6.63     | -205.72 |         |
|           |      | 106.25        |           |             | .01   |           |         | 256.28  |
| 3         |      | .00           |           |             | -.08  |           |         | 160.97  |
|           |      | .00           | -.49      | 26.35       |       | -3.54     | 234.85  |         |
|           |      | 106.25        | -.49      | -25.54      |       | -3.54     | -140.96 |         |
|           |      | 106.25        |           |             | -.08  |           |         | 160.97  |
| 113 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .01   |           |         | -48.67  |
|           |      | .00           | .23       | -11.91      |       | 7.12      | -130.69 |         |
|           |      | 106.25        | .23       | 12.08       |       | 7.12      | 625.49  |         |
|           |      | 106.25        |           |             | .01   |           |         | -48.67  |
| 2         |      | .00           |           |             | .05   |           |         | -173.05 |
|           |      | .00           | .83       | -43.50      |       | 4.66      | -62.48  |         |
|           |      | 106.25        | .83       | 44.41       |       | 4.66      | 432.30  |         |
|           |      | 106.25        |           |             | .05   |           |         | -173.05 |
| 3         |      | .00           |           |             | -.04  |           |         | -123.72 |
|           |      | .00           | .41       | -21.53      |       | 2.44      | -46.87  |         |
|           |      | 106.25        | .41       | 21.99       |       | 2.44      | 212.67  |         |
|           |      | 106.25        |           |             | -.04  |           |         | -123.72 |
| 116 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .05   |           |         | -11.96  |
|           |      | .00           | .02       | -.28        |       | 1.26      | 1744.80 |         |
|           |      | 106.25        | .02       | 2.08        |       | 1.26      | 1878.48 |         |
|           |      | 106.25        |           |             | .05   |           |         | -11.96  |
| 2         |      | .00           |           |             | .19   |           |         | -43.85  |
|           |      | .00           | .08       | -1.02       |       | .92       | 1248.35 |         |
|           |      | 106.25        | .08       | 7.36        |       | .92       | 1346.16 |         |
|           |      | 106.25        |           |             | .19   |           |         | -43.85  |
| 3         |      | .00           |           |             | .02   |           |         | -32.41  |
|           |      | .00           | .04       | -.51        |       | .54       | 690.36  |         |
|           |      | 106.25        | .04       | 3.78        |       | .54       | 747.90  |         |
|           |      | 106.25        |           |             | .02   |           |         | -32.41  |
| 117 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .05   |           |         | 11.96   |
|           |      | .00           | -.02      | 2.08        |       | -1.26     | 1878.48 |         |
|           |      | 106.25        | -.02      | -.28        |       | -1.26     | 1744.80 |         |
|           |      | 106.25        |           |             | .05   |           |         | 11.96   |
| 2         |      | .00           |           |             | .19   |           |         | 43.85   |
|           |      | .00           | -.08      | 7.36        |       | -.92      | 1346.16 |         |
|           |      | 106.25        | -.08      | -1.02       |       | -.92      | 1248.35 |         |
|           |      | 106.25        |           |             | .19   |           |         | 43.85   |
| 3         |      | .00           |           |             | .02   |           |         | 32.41   |
|           |      | .00           | -.04      | 3.78        |       | -.54      | 747.90  |         |
|           |      | 106.25        | -.04      | -.51        |       | -.54      | 690.36  |         |
|           |      | 106.25        |           |             | .02   |           |         | 32.41   |
| 120 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .01   |           |         | 48.67   |
|           |      | .00           | -.23      | 12.08       |       | -7.12     | 625.49  |         |
|           |      | 106.25        | -.23      | -11.91      |       | -7.12     | -130.69 |         |
|           |      | 106.25        |           |             | .01   |           |         | 48.67   |
| 2         |      | .00           |           |             | .05   |           |         | 173.05  |
|           |      | .00           | -.83      | 44.41       |       | -4.66     | 432.30  |         |
|           |      | 106.25        | -.83      | -43.50      |       | -4.66     | -62.48  |         |
|           |      | 106.25        |           |             | .05   |           |         | 173.05  |
| 3         |      | .00           |           |             | -.04  |           |         | 123.72  |
|           |      | .00           | -.41      | 21.99       |       | -2.44     | 212.67  |         |
|           |      | 106.25        | -.41      | -21.53      |       | -2.44     | -46.87  |         |
|           |      | 106.25        |           |             | -.04  |           |         | 123.72  |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 121 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .07   |           |         | -83.84  |
|           |      | .00           | .46       | -22.61      |       | 12.95     | -390.93 |         |
|           |      | 106.25        | .46       | 26.40       |       | 12.95     | 985.49  |         |
|           |      | 106.25        |           |             | .07   |           |         | -83.84  |
| 2         |      | .00           |           |             | .25   |           |         | -313.31 |
|           |      | .00           | 1.53      | -76.00      |       | 8.43      | -207.38 |         |
|           |      | 106.25        | 1.53      | 87.03       |       | 8.43      | 687.93  |         |
|           |      | 106.25        |           |             | .25   |           |         | -313.31 |
| 3         |      | .00           |           |             | .00   |           |         | -201.30 |
|           |      | .00           | .78       | -39.15      |       | 4.37      | -119.86 |         |
|           |      | 106.25        | .78       | 43.47       |       | 4.37      | 344.61  |         |
|           |      | 106.25        |           |             | .00   |           |         | -201.30 |
| 124 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .29   |           |         | -16.66  |
|           |      | .00           | .02       | 3.30        |       | 1.75      | 2433.68 |         |
|           |      | 106.25        | .02       | 5.93        |       | 1.75      | 2619.52 |         |
|           |      | 106.25        |           |             | .29   |           |         | -16.66  |
| 2         |      | .00           |           |             | 1.07  |           |         | -60.66  |
|           |      | .00           | .09       | 11.68       |       | 1.19      | 1660.32 |         |
|           |      | 106.25        | .09       | 21.03       |       | 1.19      | 1786.92 |         |
|           |      | 106.25        |           |             | 1.07  |           |         | -60.66  |
| 3         |      | .00           |           |             | .44   |           |         | -41.89  |
|           |      | .00           | .04       | 6.15        |       | .65       | 905.35  |         |
|           |      | 106.25        | .04       | 10.76       |       | .65       | 974.30  |         |
|           |      | 106.25        |           |             | .44   |           |         | -41.89  |
| 125 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .29   |           |         | 16.66   |
|           |      | .00           | -.02      | 5.93        |       | -1.75     | 2619.52 |         |
|           |      | 106.25        | -.02      | 3.30        |       | -1.75     | 2433.68 |         |
|           |      | 106.25        |           |             | .29   |           |         | 16.66   |
| 2         |      | .00           |           |             | 1.07  |           |         | 60.66   |
|           |      | .00           | -.09      | 21.03       |       | -1.19     | 1786.92 |         |
|           |      | 106.25        | -.09      | 11.68       |       | -1.19     | 1660.32 |         |
|           |      | 106.25        |           |             | 1.07  |           |         | 60.66   |
| 3         |      | .00           |           |             | .44   |           |         | 41.89   |
|           |      | .00           | -.04      | 10.76       |       | -.65      | 974.30  |         |
|           |      | 106.25        | -.04      | 6.15        |       | -.65      | 905.35  |         |
|           |      | 106.25        |           |             | .44   |           |         | 41.89   |
| 128 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .07   |           |         | 83.84   |
|           |      | .00           | -.46      | 26.40       |       | -12.95    | 985.49  |         |
|           |      | 106.25        | -.46      | -22.61      |       | -12.95    | -390.93 |         |
|           |      | 106.25        |           |             | .07   |           |         | 83.84   |
| 2         |      | .00           |           |             | .25   |           |         | 313.31  |
|           |      | .00           | -1.53     | 87.03       |       | -8.43     | 687.93  |         |
|           |      | 106.25        | -1.53     | -76.00      |       | -8.43     | -207.38 |         |
|           |      | 106.25        |           |             | .25   |           |         | 313.31  |
| 3         |      | .00           |           |             | .00   |           |         | 201.30  |
|           |      | .00           | -.78      | 43.47       |       | -4.37     | 344.61  |         |
|           |      | 106.25        | -.78      | -39.15      |       | -4.37     | -119.86 |         |
|           |      | 106.25        |           |             | .00   |           |         | 201.30  |
| 129 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .20   |           |         | -78.72  |
|           |      | .00           | .20       | -9.45       |       | 6.46      | -128.10 |         |
|           |      | 106.25        | .20       | 11.56       |       | 6.46      | 558.62  |         |
|           |      | 106.25        |           |             | .20   |           |         | -78.72  |
| 2         |      | .00           |           |             | .71   |           |         | -251.94 |
|           |      | .00           | .75       | -35.26      |       | .46       | 196.34  |         |
|           |      | 106.25        | .75       | 44.45       |       | .46       | 244.77  |         |
|           |      | 106.25        |           |             | .71   |           |         | -251.94 |
| 3         |      | .00           |           |             | .32   |           |         | -161.43 |
|           |      | .00           | .41       | -18.83      |       | -.23      | 129.56  |         |
|           |      | 106.25        | .41       | 24.28       |       | -.23      | 105.21  |         |
|           |      | 106.25        |           |             | .32   |           |         | -161.43 |

F R A M E E L E M E N T F O R C E S

| ELT LOAD<br>ID COND | DIST<br>ENDI | 1-2 PLANE |        | AXIAL<br>FORCE | 1-3 PLANE |         | AXIAL<br>TORQ |
|---------------------|--------------|-----------|--------|----------------|-----------|---------|---------------|
|                     |              | SHEAR     | MOMENT |                | SHEAR     | MOMENT  |               |
| 132                 | -----        |           |        |                |           |         |               |
| 1                   | .00          |           |        | .51            |           |         | -15.58        |
|                     | .00          | .01       | 3.95   |                | .99       | 1553.76 |               |
|                     | 106.25       | .01       | 4.96   |                | .99       | 1658.60 |               |
|                     | 106.25       |           |        | .51            |           |         | -15.58        |
| 2                   | .00          |           |        | 1.81           |           |         | -55.02        |
|                     | .00          | .03       | 13.88  |                | .24       | 990.70  |               |
|                     | 106.25       | .03       | 17.52  |                | .24       | 1016.70 |               |
|                     | 106.25       |           |        | 1.81           |           |         | -55.02        |
| 3                   | .00          |           |        | .87            |           |         | -37.07        |
|                     | .00          | .02       | 7.27   |                | .07       | 527.61  |               |
|                     | 106.25       | .02       | 8.92   |                | .07       | 535.38  |               |
|                     | 106.25       |           |        | .87            |           |         | -37.07        |
| 133                 | -----        |           |        |                |           |         |               |
| 1                   | .00          |           |        | .51            |           |         | 15.58         |
|                     | .00          | -.01      | 4.96   |                | -.99      | 1658.60 |               |
|                     | 106.25       | -.01      | 3.95   |                | -.99      | 1553.76 |               |
|                     | 106.25       |           |        | .51            |           |         | 15.58         |
| 2                   | .00          |           |        | 1.81           |           |         | 55.02         |
|                     | .00          | -.03      | 17.52  |                | -.24      | 1016.70 |               |
|                     | 106.25       | -.03      | 13.88  |                | -.24      | 990.70  |               |
|                     | 106.25       |           |        | 1.81           |           |         | 55.02         |
| 3                   | .00          |           |        | .87            |           |         | 37.07         |
|                     | .00          | -.02      | 8.92   |                | -.07      | 535.38  |               |
|                     | 106.25       | -.02      | 7.27   |                | -.07      | 527.61  |               |
|                     | 106.25       |           |        | .87            |           |         | 37.07         |
| 136                 | -----        |           |        |                |           |         |               |
| 1                   | .00          |           |        | .20            |           |         | 78.72         |
|                     | .00          | -.20      | 11.56  |                | -6.46     | 558.62  |               |
|                     | 106.25       | -.20      | -9.45  |                | -6.46     | -128.10 |               |
|                     | 106.25       |           |        | .20            |           |         | 78.72         |
| 2                   | .00          |           |        | .71            |           |         | 251.94        |
|                     | .00          | -.75      | 44.45  |                | -.46      | 244.77  |               |
|                     | 106.25       | -.75      | -35.26 |                | -.46      | 196.34  |               |
|                     | 106.25       |           |        | .71            |           |         | 251.94        |
| 3                   | .00          |           |        | .32            |           |         | 161.43        |
|                     | .00          | -.41      | 24.28  |                | .23       | 105.21  |               |
|                     | 106.25       | -.41      | -18.83 |                | .23       | 129.56  |               |
|                     | 106.25       |           |        | .32            |           |         | 161.43        |

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J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)    | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|---------|----------|----------|----------|---------|----------|
| 1     | .011221 | -.000074 | -.346870 | -.000275 | .000024 | .000000  |
| 2     | .011168 | -.000065 | -.375742 | -.000261 | .000028 | .000000  |
| 3     | .011126 | -.000047 | -.400535 | -.000200 | .000032 | .000000  |
| 4     | .011100 | -.000025 | -.417109 | -.000108 | .000035 | .000000  |
| 5     | .011092 | .000000  | -.422919 | .000000  | .000036 | .000000  |
| 6     | .011100 | .000025  | -.417109 | .000108  | .000035 | -.000000 |
| 7     | .011126 | .000047  | -.400535 | .000200  | .000032 | -.000000 |
| 8     | .011168 | .000065  | -.375742 | .000261  | .000028 | -.000000 |
| 9     | .011221 | .000074  | -.346870 | .000275  | .000024 | -.000000 |
| 10    | .011222 | -.000020 | -.350782 | -.000280 | .000025 | .000000  |
| 11    | .011163 | -.000019 | -.380424 | -.000268 | .000030 | .000000  |
| 12    | .011121 | -.000014 | -.405899 | -.000205 | .000034 | .000000  |
| 13    | .011098 | -.000007 | -.422913 | -.000111 | .000036 | .000000  |
| 14    | .011091 | .000000  | -.428874 | .000000  | .000037 | .000000  |
| 15    | .011098 | .000007  | -.422913 | .000111  | .000036 | -.000000 |
| 16    | .011121 | .000014  | -.405899 | .000205  | .000034 | -.000000 |
| 17    | .011163 | .000019  | -.380424 | .000268  | .000030 | -.000000 |
| 18    | .011222 | .000020  | -.350782 | .000280  | .000025 | -.000000 |
| 19    | .011198 | .000003  | -.352853 | -.000285 | .000026 | .000000  |
| 20    | .011152 | .000002  | -.382770 | -.000270 | .000030 | .000000  |
| 21    | .011116 | .000001  | -.408537 | -.000208 | .000034 | .000000  |
| 22    | .011095 | .000000  | -.425766 | -.000112 | .000037 | .000000  |
| 23    | .011088 | .000000  | -.431801 | .000000  | .000038 | .000000  |
| 24    | .011095 | .000000  | -.425766 | .000112  | .000037 | .000000  |
| 25    | .011116 | -.000001 | -.408537 | .000208  | .000034 | -.000000 |
| 26    | .011152 | -.000002 | -.382770 | .000270  | .000030 | -.000000 |
| 27    | .011198 | -.000003 | -.352853 | .000285  | .000026 | -.000000 |
| 28    | .011181 | .000014  | -.354681 | -.000286 | .000023 | .000000  |
| 29    | .011140 | .000013  | -.385022 | -.000274 | .000028 | .000000  |
| 30    | .011109 | .000009  | -.411138 | -.000210 | .000033 | .000000  |
| 31    | .011091 | .000005  | -.428577 | -.000114 | .000035 | .000000  |
| 32    | .011085 | .000000  | -.434686 | .000000  | .000036 | .000000  |
| 33    | .011091 | -.000005 | -.428577 | .000114  | .000035 | .000000  |
| 34    | .011109 | -.000009 | -.411138 | .000210  | .000033 | -.000000 |
| 35    | .011140 | -.000013 | -.385022 | .000274  | .000028 | -.000000 |
| 36    | .011181 | -.000014 | -.354681 | .000286  | .000023 | -.000000 |
| 37    | .011168 | .000026  | -.356479 | -.000289 | .000024 | .000000  |
| 38    | .011125 | .000022  | -.387193 | -.000277 | .000028 | .000000  |
| 39    | .011100 | .000015  | -.413610 | -.000213 | .000031 | .000000  |
| 40    | .011085 | .000008  | -.431242 | -.000115 | .000033 | .000000  |
| 41    | .011081 | .000000  | -.437417 | .000000  | .000034 | .000000  |
| 42    | .011085 | -.000008 | -.431242 | .000115  | .000033 | .000000  |
| 43    | .011100 | -.000015 | -.413610 | .000213  | .000031 | .000000  |
| 44    | .011125 | -.000022 | -.387193 | .000277  | .000028 | -.000000 |
| 45    | .011168 | -.000026 | -.356479 | .000289  | .000024 | -.000000 |
| 46    | .011130 | .000032  | -.358375 | -.000294 | .000023 | .000000  |
| 47    | .011107 | .000027  | -.389256 | -.000279 | .000025 | .000000  |
| 48    | .011089 | .000019  | -.415877 | -.000215 | .000028 | .000000  |
| 49    | .011078 | .000010  | -.433669 | -.000116 | .000029 | .000000  |
| 50    | .011075 | .000000  | -.439900 | .000000  | .000030 | .000000  |
| 51    | .011078 | -.000010 | -.433669 | .000116  | .000029 | .000000  |
| 52    | .011089 | -.000019 | -.415877 | .000215  | .000028 | .000000  |
| 53    | .011107 | -.000027 | -.389256 | .000279  | .000025 | .000000  |
| 54    | .011130 | -.000032 | -.358375 | .000294  | .000023 | .000000  |
| 55    | .011098 | .000033  | -.359938 | -.000294 | .000019 | .000000  |
| 56    | .011088 | .000029  | -.391078 | -.000281 | .000022 | .000000  |
| 57    | .011077 | .000021  | -.417898 | -.000216 | .000024 | .000000  |
| 58    | .011070 | .000011  | -.435808 | -.000117 | .000026 | .000000  |
| 59    | .011068 | .000000  | -.442080 | .000000  | .000026 | .000000  |
| 60    | .011070 | -.000011 | -.435808 | .000117  | .000026 | .000000  |
| 61    | .011077 | -.000021 | -.417898 | .000216  | .000024 | .000000  |
| 62    | .011088 | -.000029 | -.391078 | .000281  | .000022 | .000000  |
| 63    | .011098 | -.000033 | -.359938 | .000294  | .000019 | .000000  |
| 64    | .011079 | .000033  | -.361484 | -.000295 | .000021 | .000000  |
| 65    | .011069 | .000029  | -.392751 | -.000283 | .000021 | .000000  |
| 66    | .011064 | .000021  | -.419679 | -.000217 | .000022 | .000000  |
| 67    | .011061 | .000011  | -.437663 | -.000117 | .000022 | .000000  |
| 68    | .011060 | .000000  | -.443962 | .000000  | .000022 | .000000  |
| 69    | .011061 | -.000011 | -.437663 | .000117  | .000022 | .000000  |
| 70    | .011064 | -.000021 | -.419679 | .000217  | .000022 | .000000  |
| 71    | .011069 | -.000029 | -.392751 | .000283  | .000021 | .000000  |
| 72    | .011079 | -.000033 | -.361484 | .000295  | .000021 | .000000  |
| 73    | .011046 | .000032  | -.363069 | -.000297 | .000018 | .000000  |
| 74    | .011049 | .000029  | -.394303 | -.000282 | .000019 | .000000  |
| 75    | .011051 | .000021  | -.421247 | -.000217 | .000019 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)    | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|---------|----------|----------|----------|---------|----------|
| 76    | .011052 | .000011  | -.439263 | -.000117 | .000019 | .000000  |
| 77    | .011052 | .000000  | -.445574 | .000000  | .000019 | .000000  |
| 78    | .011052 | -.000011 | -.439263 | .000117  | .000019 | .000000  |
| 79    | .011051 | -.000021 | -.421247 | .000217  | .000019 | .000000  |
| 80    | .011049 | -.000029 | -.394303 | .000282  | .000019 | .000000  |
| 81    | .011046 | -.000032 | -.363069 | .000297  | .000018 | .000000  |
| 82    | .011012 | .000031  | -.364342 | -.000295 | .000017 | .000000  |
| 83    | .011029 | .000028  | -.395655 | -.000283 | .000017 | .000000  |
| 84    | .011038 | .000020  | -.422616 | -.000217 | .000016 | .000000  |
| 85    | .011043 | .000011  | -.440621 | -.000117 | .000016 | .000000  |
| 86    | .011044 | .000000  | -.446927 | .000000  | .000016 | .000000  |
| 87    | .011043 | -.000011 | -.440621 | .000117  | .000016 | .000000  |
| 88    | .011038 | -.000020 | -.422616 | .000217  | .000016 | .000000  |
| 89    | .011029 | -.000028 | -.395655 | .000283  | .000017 | .000000  |
| 90    | .011012 | -.000031 | -.364342 | .000295  | .000017 | .000000  |
| 91    | .010995 | .000030  | -.365681 | -.000294 | .000018 | .000000  |
| 92    | .011011 | .000026  | -.396895 | -.000282 | .000015 | .000000  |
| 93    | .011025 | .000019  | -.423777 | -.000217 | .000014 | .000000  |
| 94    | .011034 | .000010  | -.441727 | -.000117 | .000013 | .000000  |
| 95    | .011037 | .000000  | -.448013 | .000000  | .000012 | .000000  |
| 96    | .011034 | -.000010 | -.441727 | .000117  | .000013 | .000000  |
| 97    | .011025 | -.000019 | -.423777 | .000217  | .000014 | .000000  |
| 98    | .011011 | -.000026 | -.396895 | .000282  | .000015 | .000000  |
| 99    | .010995 | -.000030 | -.365681 | .000294  | .000018 | .000000  |
| 100   | .010966 | .000027  | -.367003 | -.000295 | .000014 | .000000  |
| 101   | .010993 | .000023  | -.397993 | -.000280 | .000013 | .000000  |
| 102   | .011014 | .000016  | -.424705 | -.000215 | .000010 | .000000  |
| 103   | .011026 | .000008  | -.442555 | -.000116 | .000009 | .000000  |
| 104   | .011030 | .000000  | -.448805 | .000000  | .000008 | .000000  |
| 105   | .011026 | -.000008 | -.442555 | .000116  | .000009 | .000000  |
| 106   | .011014 | -.000016 | -.424705 | .000215  | .000010 | .000000  |
| 107   | .010993 | -.000023 | -.397993 | .000280  | .000013 | .000000  |
| 108   | .010966 | -.000027 | -.367003 | .000295  | .000014 | .000000  |
| 109   | .010931 | .000020  | -.368000 | -.000291 | .000014 | -.000000 |
| 110   | .010977 | .000016  | -.398859 | -.000279 | .000010 | -.000000 |
| 111   | .011004 | .000012  | -.425392 | -.000214 | .000007 | .000000  |
| 112   | .011020 | .000006  | -.443099 | -.000115 | .000005 | .000000  |
| 113   | .011025 | .000000  | -.449299 | .000000  | .000005 | .000000  |
| 114   | .011020 | -.000006 | -.443099 | .000115  | .000005 | .000000  |
| 115   | .011004 | -.000012 | -.425392 | .000214  | .000007 | .000000  |
| 116   | .010977 | -.000016 | -.398859 | .000279  | .000010 | .000000  |
| 117   | .010931 | -.000020 | -.368000 | .000291  | .000014 | .000000  |
| 118   | .010921 | .000007  | -.369116 | -.000288 | .000015 | -.000000 |
| 119   | .010964 | .000007  | -.399628 | -.000276 | .000010 | -.000000 |
| 120   | .010996 | .000005  | -.425882 | -.000212 | .000005 | -.000000 |
| 121   | .011015 | .000003  | -.443410 | -.000114 | .000003 | .000000  |
| 122   | .011021 | .000000  | -.449549 | .000000  | .000002 | .000000  |
| 123   | .011015 | -.000003 | -.443410 | .000114  | .000003 | .000000  |
| 124   | .010996 | -.000005 | -.425882 | .000212  | .000005 | .000000  |
| 125   | .010964 | -.000007 | -.399628 | .000276  | .000010 | .000000  |
| 126   | .010921 | -.000007 | -.369116 | .000288  | .000015 | .000000  |
| 127   | .010907 | -.000005 | -.370212 | -.000287 | .000012 | -.000000 |
| 128   | .010953 | -.000004 | -.400320 | -.000272 | .000008 | -.000000 |
| 129   | .010990 | -.000004 | -.426243 | -.000209 | .000004 | -.000000 |
| 130   | .011011 | -.000002 | -.443573 | -.000113 | .000002 | .000000  |
| 131   | .011018 | .000000  | -.449644 | .000000  | .000001 | .000000  |
| 132   | .011011 | .000002  | -.443573 | .000113  | .000002 | .000000  |
| 133   | .010990 | .000004  | -.426243 | .000209  | .000004 | .000000  |
| 134   | .010953 | .000004  | -.400320 | .000272  | .000008 | .000000  |
| 135   | .010907 | .000005  | -.370212 | .000287  | .000012 | .000000  |
| 136   | .010885 | -.000027 | -.371054 | -.000283 | .000012 | -.000000 |
| 137   | .010944 | -.000025 | -.400913 | -.000269 | .000008 | -.000000 |
| 138   | .010986 | -.000019 | -.426561 | -.000207 | .000004 | -.000000 |
| 139   | .011009 | -.000010 | -.443689 | -.000112 | .000002 | -.000000 |
| 140   | .011016 | .000000  | -.449690 | .000000  | .000001 | .000000  |
| 141   | .011009 | .000010  | -.443689 | .000112  | .000002 | .000000  |
| 142   | .010986 | .000019  | -.426561 | .000207  | .000004 | .000000  |
| 143   | .010944 | .000025  | -.400913 | .000269  | .000008 | .000000  |
| 144   | .010885 | .000027  | -.371054 | .000283  | .000012 | .000000  |
| 145   | .010886 | -.000080 | -.372930 | -.000278 | .000013 | -.000000 |
| 146   | .010940 | -.000070 | -.402138 | -.000264 | .000009 | -.000000 |
| 147   | .010982 | -.000050 | -.427222 | -.000203 | .000005 | -.000000 |
| 148   | .011007 | -.000026 | -.443990 | -.000109 | .000003 | -.000000 |
| 149   | .011015 | .000000  | -.449867 | .000000  | .000002 | .000000  |
| 150   | .011007 | .000026  | -.443990 | .000109  | .000003 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|----------|----------|----------|----------|---------|----------|
| 151   | .010982  | .000050  | -.427222 | .000203  | .000005 | .000000  |
| 152   | .010940  | .000070  | -.402138 | .000264  | .000009 | .000000  |
| 153   | .010886  | .000080  | -.372930 | .000278  | .000013 | .000000  |
| 154   | .000000  | .000000  | -.342768 | .000279  | .000019 | .000000  |
| 155   | .002171  | -.026117 | -.343676 | .000167  | .000018 | -.000000 |
| 156   | .004244  | -.039144 | -.344545 | .000056  | .000018 | -.000001 |
| 157   | .006340  | -.039097 | -.345363 | -.000056 | .000019 | -.000001 |
| 158   | .008618  | -.026008 | -.346133 | -.000167 | .000021 | -.000001 |
| 159   | -.000072 | .000013  | -.346111 | .000280  | .000021 | -.000000 |
| 160   | .002186  | -.026164 | -.347001 | .000168  | .000018 | -.000000 |
| 161   | .004254  | -.039241 | -.347910 | .000056  | .000018 | -.000001 |
| 162   | .006333  | -.039243 | -.348845 | -.000056 | .000018 | -.000001 |
| 163   | .008586  | -.026191 | -.349805 | -.000167 | .000021 | -.000001 |
| 164   | -.000089 | -.000008 | -.349792 | .000282  | .000023 | -.000000 |
| 165   | .002298  | -.026439 | -.350883 | .000170  | .000019 | .000001  |
| 166   | .004414  | -.039813 | -.351911 | .000058  | .000018 | .000000  |
| 167   | .006493  | -.039992 | -.352883 | -.000055 | .000018 | -.000000 |
| 168   | .008694  | -.026766 | -.353803 | -.000171 | .000020 | -.000001 |
| 169   | -.000061 | -.000022 | -.351603 | .000279  | .000020 | .000000  |
| 170   | .002252  | -.026360 | -.352465 | .000170  | .000019 | .000001  |
| 171   | .004414  | -.039779 | -.353390 | .000058  | .000018 | .000000  |
| 172   | .006495  | -.040003 | -.354371 | -.000055 | .000018 | -.000000 |
| 173   | .008674  | -.026823 | -.355405 | -.000171 | .000020 | -.000001 |
| 174   | -.000045 | -.000029 | -.354995 | .000280  | .000022 | .000000  |
| 175   | .002250  | -.026649 | -.355978 | .000173  | .000019 | -.000002 |
| 176   | .004410  | -.040313 | -.356976 | .000060  | .000018 | -.000002 |
| 177   | .006585  | -.040617 | -.357970 | -.000055 | .000019 | -.000001 |
| 178   | .008810  | -.027262 | -.358957 | -.000173 | .000019 | -.000001 |
| 179   | -.000007 | -.000023 | -.356384 | .000286  | .000018 | .000000  |
| 180   | .002211  | -.026812 | -.357410 | .000173  | .000019 | -.000002 |
| 181   | .004409  | -.040441 | -.358421 | .000060  | .000019 | -.000002 |
| 182   | .006587  | -.040714 | -.359435 | -.000056 | .000019 | -.000001 |
| 183   | .008790  | -.027329 | -.360457 | -.000174 | .000019 | -.000001 |
| 184   | .000013  | -.000021 | -.359207 | .000287  | .000020 | .000000  |
| 185   | .002193  | -.026926 | -.360222 | .000173  | .000019 | .000002  |
| 186   | .004419  | -.040596 | -.361231 | .000060  | .000019 | .000001  |
| 187   | .006686  | -.040844 | -.362252 | -.000056 | .000019 | .000001  |
| 188   | .008915  | -.027396 | -.363290 | -.000174 | .000019 | .000001  |
| 189   | .000058  | -.000025 | -.360687 | .000283  | .000015 | .000000  |
| 190   | .002142  | -.026798 | -.361698 | .000174  | .000019 | .000002  |
| 191   | .004418  | -.040497 | -.362715 | .000060  | .000019 | .000001  |
| 192   | .006689  | -.040769 | -.363719 | -.000056 | .000019 | .000001  |
| 193   | .008894  | -.027346 | -.364706 | -.000174 | .000018 | .000001  |
| 194   | .000067  | -.000011 | -.363052 | .000283  | .000018 | .000000  |
| 195   | .002179  | -.026743 | -.363923 | .000173  | .000019 | -.000001 |
| 196   | .004452  | -.040276 | -.364862 | .000058  | .000020 | -.000001 |
| 197   | .006792  | -.040408 | -.365859 | -.000057 | .000020 | -.000000 |
| 198   | .009026  | -.027031 | -.366908 | -.000172 | .000018 | .000001  |
| 199   | .000081  | .000003  | -.364163 | .000288  | .000015 | .000000  |
| 200   | .002148  | -.026856 | -.365272 | .000172  | .000019 | -.000001 |
| 201   | .004452  | -.040336 | -.366314 | .000058  | .000020 | -.000001 |
| 202   | .006793  | -.040418 | -.367298 | -.000057 | .000020 | -.000000 |
| 203   | .009004  | -.026989 | -.368228 | -.000173 | .000018 | .000001  |
| 204   | .000054  | .000016  | -.366365 | .000286  | .000018 | .000000  |
| 205   | .002281  | -.026717 | -.367249 | .000171  | .000020 | .000000  |
| 206   | .004651  | -.039954 | -.368158 | .000056  | .000020 | .000000  |
| 207   | .006989  | -.039831 | -.369097 | -.000058 | .000019 | .000001  |
| 208   | .009137  | -.026495 | -.370066 | -.000170 | .000017 | .000001  |
| 209   | .000000  | .000000  | -.368824 | .000287  | .000018 | -.000000 |
| 210   | .002274  | -.026723 | -.369758 | .000170  | .000020 | .000000  |
| 211   | .004655  | -.039918 | -.370640 | .000056  | .000020 | .000000  |
| 212   | .006985  | -.039753 | -.371457 | -.000058 | .000019 | .000001  |
| 213   | .009112  | -.026380 | -.372214 | -.000170 | .000017 | .000001  |
| 214   | -.000049 | -.000025 | -.352998 | .000285  | .000023 | -.000000 |
| 215   | .000057  | -.000018 | -.361551 | .000288  | .000015 | .000000  |
| 216   | .000000  | .000000  | -.342768 | -.000279 | .000019 | -.000000 |
| 217   | .002171  | .026117  | -.343676 | -.000167 | .000018 | .000000  |
| 218   | .004244  | .039144  | -.344545 | -.000056 | .000018 | .000001  |
| 219   | .006340  | .039097  | -.345363 | .000056  | .000019 | .000001  |
| 220   | .008618  | .026008  | -.346133 | .000167  | .000021 | .000001  |
| 221   | -.000072 | -.000013 | -.346111 | -.000280 | .000021 | .000000  |
| 222   | .002186  | .026164  | -.347001 | -.000168 | .000018 | .000000  |
| 223   | .004254  | .039241  | -.347910 | -.000056 | .000018 | .000001  |
| 224   | .006333  | .039243  | -.348845 | .000056  | .000018 | .000001  |
| 225   | .008586  | .026191  | -.349805 | .000167  | .000021 | .000001  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|----------|----------|----------|----------|---------|----------|
| 226   | -.000089 | .000008  | -.349792 | -.000282 | .000023 | .000000  |
| 227   | .002298  | .026439  | -.350883 | -.000170 | .000019 | -.000001 |
| 228   | .004414  | .039813  | -.351911 | -.000058 | .000018 | -.000000 |
| 229   | .006493  | .039992  | -.352883 | .000055  | .000018 | .000000  |
| 230   | .008694  | .026766  | -.353803 | .000171  | .000020 | .000001  |
| 231   | -.000061 | .000022  | -.351603 | -.000279 | .000020 | .000000  |
| 232   | .002252  | .026360  | -.352465 | -.000170 | .000019 | -.000001 |
| 233   | .004414  | .039779  | -.353390 | -.000058 | .000018 | -.000000 |
| 234   | .006495  | .040003  | -.354371 | .000055  | .000018 | .000000  |
| 235   | .008674  | .026823  | -.355405 | .000171  | .000020 | .000001  |
| 236   | -.000045 | .000029  | -.354995 | -.000280 | .000022 | .000000  |
| 237   | .002250  | .026649  | -.355978 | -.000173 | .000019 | .000002  |
| 238   | .004410  | .040313  | -.356976 | -.000060 | .000018 | .000002  |
| 239   | .006585  | .040617  | -.357970 | .000055  | .000019 | .000001  |
| 240   | .008810  | .027262  | -.358957 | .000173  | .000019 | .000001  |
| 241   | -.000007 | .000023  | -.356384 | -.000286 | .000018 | .000000  |
| 242   | .002211  | .026812  | -.357410 | -.000173 | .000019 | .000002  |
| 243   | .004409  | .040441  | -.358421 | -.000060 | .000019 | .000002  |
| 244   | .006587  | .040714  | -.359435 | .000056  | .000019 | .000001  |
| 245   | .008790  | .027329  | -.360457 | .000174  | .000019 | .000001  |
| 246   | .000013  | .000021  | -.359207 | -.000287 | .000020 | .000000  |
| 247   | .002193  | .026926  | -.360222 | -.000173 | .000019 | -.000002 |
| 248   | .004419  | .040596  | -.361231 | -.000060 | .000019 | -.000001 |
| 249   | .006686  | .040844  | -.362252 | .000056  | .000019 | -.000001 |
| 250   | .008915  | .027396  | -.363290 | .000174  | .000019 | -.000001 |
| 251   | .000058  | .000025  | -.360687 | -.000283 | .000015 | .000000  |
| 252   | .002142  | .026798  | -.361698 | -.000174 | .000019 | -.000002 |
| 253   | .004418  | .040497  | -.362715 | -.000060 | .000019 | -.000001 |
| 254   | .006689  | .040769  | -.363719 | .000056  | .000019 | -.000001 |
| 255   | .008894  | .027346  | -.364706 | .000174  | .000018 | -.000001 |
| 256   | .000067  | .000011  | -.363052 | -.000283 | .000018 | .000000  |
| 257   | .002179  | .026743  | -.363923 | -.000173 | .000019 | .000001  |
| 258   | .004452  | .040276  | -.364862 | -.000058 | .000020 | .000001  |
| 259   | .006792  | .040408  | -.365859 | .000057  | .000020 | .000000  |
| 260   | .009026  | .027031  | -.366908 | .000172  | .000018 | -.000001 |
| 261   | .000081  | -.000003 | -.364163 | -.000288 | .000015 | -.000000 |
| 262   | .002148  | .026856  | -.365272 | -.000172 | .000019 | .000001  |
| 263   | .004452  | .040336  | -.366314 | -.000058 | .000020 | .000001  |
| 264   | .006793  | .040418  | -.367298 | .000057  | .000020 | .000000  |
| 265   | .009004  | .026989  | -.368228 | .000173  | .000018 | -.000001 |
| 266   | .000054  | -.000016 | -.366365 | -.000286 | .000018 | .000000  |
| 267   | .002281  | .026717  | -.367249 | -.000171 | .000020 | .000000  |
| 268   | .004651  | .039954  | -.368158 | -.000056 | .000020 | -.000000 |
| 269   | .006989  | .039831  | -.369097 | .000058  | .000019 | -.000001 |
| 270   | .009137  | .026495  | -.370066 | .000170  | .000017 | -.000001 |
| 271   | .000000  | .000000  | -.368824 | -.000287 | .000018 | .000000  |
| 272   | .002274  | .026723  | -.369758 | -.000170 | .000020 | .000000  |
| 273   | .004655  | .039918  | -.370640 | -.000056 | .000020 | -.000000 |
| 274   | .006985  | .039753  | -.371457 | .000058  | .000019 | -.000001 |
| 275   | .009112  | .026380  | -.372214 | .000170  | .000017 | -.000001 |
| 276   | -.000049 | .000025  | -.352998 | -.000285 | .000023 | .000000  |
| 277   | .000057  | .000018  | -.361551 | -.000288 | .000015 | -.000000 |
| 278   | -.000030 | .000004  | -.313298 | .000266  | .000020 | .000000  |
| 279   | -.000034 | .000006  | -.288038 | .000203  | .000020 | .000000  |
| 280   | -.000028 | .000004  | -.271235 | .000109  | .000020 | .000000  |
| 281   | -.000025 | .000000  | -.265362 | .000000  | .000020 | .000000  |
| 282   | -.000028 | -.000004 | -.271235 | -.000109 | .000020 | .000000  |
| 283   | -.000034 | -.000006 | -.288038 | -.000203 | .000020 | .000000  |
| 284   | -.000030 | -.000004 | -.313298 | -.000266 | .000020 | -.000000 |
| 285   | -.000047 | .000011  | -.316457 | .000266  | .000021 | -.000000 |
| 286   | -.000032 | .000007  | -.291147 | .000204  | .000020 | .000000  |
| 287   | -.000024 | .000003  | -.274294 | .000110  | .000020 | .000000  |
| 288   | -.000022 | .000000  | -.268403 | .000000  | .000020 | .000000  |
| 289   | -.000024 | -.000003 | -.274294 | -.000110 | .000020 | .000000  |
| 290   | -.000032 | -.000007 | -.291147 | -.000204 | .000020 | .000000  |
| 291   | -.000047 | -.000011 | -.316457 | -.000266 | .000021 | .000000  |
| 292   | -.000051 | -.000005 | -.319783 | .000269  | .000021 | -.000000 |
| 293   | -.000028 | -.000003 | -.294253 | .000205  | .000020 | -.000000 |
| 294   | -.000019 | -.000002 | -.277293 | .000110  | .000019 | .000000  |
| 295   | -.000016 | .000000  | -.271368 | .000000  | .000019 | .000000  |
| 296   | -.000019 | .000002  | -.277293 | -.000110 | .000019 | .000000  |
| 297   | -.000028 | .000003  | -.294253 | -.000205 | .000020 | .000000  |
| 298   | -.000051 | .000005  | -.319783 | -.000269 | .000021 | .000000  |
| 299   | -.000033 | -.000019 | -.322888 | .000269  | .000021 | -.000000 |
| 300   | -.000020 | -.000013 | -.297258 | .000206  | .000019 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|----------|----------|----------|----------|---------|----------|
| 301   | -.000013 | -.000006 | -.280186 | .000111  | .000018 | .000000  |
| 302   | -.000011 | .000000  | -.274217 | .000000  | .000018 | .000000  |
| 303   | -.000013 | .000006  | -.280186 | -.000111 | .000018 | .000000  |
| 304   | -.000020 | .000013  | -.297258 | -.000206 | .000019 | .000000  |
| 305   | -.000033 | .000019  | -.322888 | -.000269 | .000021 | .000000  |
| 306   | -.000009 | -.000020 | -.325989 | .000272  | .000019 | .000000  |
| 307   | -.000007 | -.000014 | -.300103 | .000208  | .000018 | .000000  |
| 308   | -.000005 | -.000007 | -.282897 | .000112  | .000017 | .000000  |
| 309   | -.000005 | .000000  | -.276886 | .000000  | .000017 | .000000  |
| 310   | -.000005 | .000007  | -.282897 | -.000112 | .000017 | .000000  |
| 311   | -.000007 | .000014  | -.300103 | -.000208 | .000018 | .000000  |
| 312   | -.000009 | .000020  | -.325989 | -.000272 | .000019 | .000000  |
| 313   | .000011  | -.000018 | -.328692 | .000273  | .000017 | .000000  |
| 314   | .000007  | -.000013 | -.302697 | .000209  | .000016 | .000000  |
| 315   | .000003  | -.000007 | -.285412 | .000112  | .000016 | .000000  |
| 316   | .000002  | .000000  | -.279373 | .000000  | .000016 | .000000  |
| 317   | .000003  | .000007  | -.285412 | -.000112 | .000016 | .000000  |
| 318   | .000007  | .000013  | -.302697 | -.000209 | .000016 | .000000  |
| 319   | .000011  | .000018  | -.328692 | -.000273 | .000017 | .000000  |
| 320   | .000034  | -.000015 | -.331060 | .000273  | .000016 | .000000  |
| 321   | .000019  | -.000010 | -.305087 | .000209  | .000015 | .000000  |
| 322   | .000011  | -.000005 | -.287783 | .000113  | .000015 | .000000  |
| 323   | .000008  | .000000  | -.281732 | .000000  | .000015 | .000000  |
| 324   | .000011  | .000005  | -.287783 | -.000113 | .000015 | .000000  |
| 325   | .000019  | .000010  | -.305087 | -.000209 | .000015 | .000000  |
| 326   | .000034  | .000015  | -.331060 | -.000273 | .000016 | -.000000 |
| 327   | .000046  | .000001  | -.333529 | .000274  | .000016 | .000000  |
| 328   | .000026  | .000000  | -.307453 | .000210  | .000016 | .000000  |
| 329   | .000017  | .000000  | -.290118 | .000113  | .000015 | .000000  |
| 330   | .000014  | .000000  | -.284060 | .000000  | .000015 | .000000  |
| 331   | .000017  | .000000  | -.290118 | -.000113 | .000015 | .000000  |
| 332   | .000026  | -.000000 | -.307453 | -.000210 | .000016 | -.000000 |
| 333   | .000046  | -.000001 | -.333529 | -.000274 | .000016 | -.000000 |
| 334   | .000040  | .000013  | -.335907 | .000273  | .000017 | .000000  |
| 335   | .000029  | .000008  | -.309889 | .000210  | .000016 | .000000  |
| 336   | .000022  | .000004  | -.292529 | .000113  | .000016 | .000000  |
| 337   | .000019  | .000000  | -.286455 | .000000  | .000016 | .000000  |
| 338   | .000022  | -.000004 | -.292529 | -.000113 | .000016 | .000000  |
| 339   | .000029  | -.000008 | -.309889 | -.000210 | .000016 | .000000  |
| 340   | .000040  | -.000013 | -.335907 | -.000273 | .000017 | -.000000 |
| 341   | .000027  | .000004  | -.338493 | .000274  | .000017 | -.000000 |
| 342   | .000030  | .000006  | -.312400 | .000210  | .000016 | .000000  |
| 343   | .000024  | .000004  | -.294998 | .000113  | .000016 | .000000  |
| 344   | .000022  | .000000  | -.288910 | .000000  | .000016 | .000000  |
| 345   | .000024  | -.000004 | -.294998 | -.000113 | .000016 | .000000  |
| 346   | .000030  | -.000006 | -.312400 | -.000210 | .000016 | .000000  |
| 347   | .000027  | -.000004 | -.338493 | -.000274 | .000017 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 2 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)    | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|---------|----------|----------|----------|---------|----------|
| 1     | .013852 | -.000265 | -.249016 | -.000172 | .000037 | .000002  |
| 2     | .013666 | -.000231 | -.266572 | -.000158 | .000051 | .000002  |
| 3     | .013520 | -.000168 | -.281419 | -.000121 | .000063 | .000001  |
| 4     | .013433 | -.000087 | -.291356 | -.000065 | .000072 | .000001  |
| 5     | .013404 | .000000  | -.294849 | .000000  | .000075 | .000000  |
| 6     | .013433 | .000087  | -.291356 | .000065  | .000072 | -.000001 |
| 7     | .013520 | .000168  | -.281419 | .000121  | .000063 | -.000001 |
| 8     | .013666 | .000231  | -.266572 | .000158  | .000051 | -.000002 |
| 9     | .013852 | .000265  | -.249016 | .000172  | .000037 | -.000002 |
| 10    | .013836 | -.000082 | -.255093 | -.000190 | .000039 | .000002  |
| 11    | .013645 | -.000077 | -.275095 | -.000180 | .000056 | .000001  |
| 12    | .013505 | -.000057 | -.292217 | -.000138 | .000070 | .000001  |
| 13    | .013425 | -.000030 | -.303659 | -.000075 | .000080 | .000000  |
| 14    | .013399 | .000000  | -.307673 | .000000  | .000083 | .000000  |
| 15    | .013425 | .000030  | -.303659 | .000075  | .000080 | -.000000 |
| 16    | .013505 | .000057  | -.292217 | .000138  | .000070 | -.000001 |
| 17    | .013645 | .000077  | -.275095 | .000180  | .000056 | -.000001 |
| 18    | .013836 | .000082  | -.255093 | .000190  | .000039 | -.000002 |
| 19    | .013772 | -.000008 | -.258537 | -.000202 | .000047 | .000001  |
| 20    | .013611 | -.000007 | -.279668 | -.000191 | .000061 | .000001  |
| 21    | .013487 | -.000006 | -.297885 | -.000147 | .000075 | .000001  |
| 22    | .013415 | -.000004 | -.310084 | -.000080 | .000085 | .000000  |
| 23    | .013392 | .000000  | -.314361 | .000000  | .000088 | .000000  |
| 24    | .013415 | .000004  | -.310084 | .000080  | .000085 | -.000000 |
| 25    | .013487 | .000006  | -.297885 | .000147  | .000075 | -.000001 |
| 26    | .013611 | .000007  | -.279668 | .000191  | .000061 | -.000001 |
| 27    | .013772 | .000008  | -.258537 | .000202  | .000047 | -.000001 |
| 28    | .013734 | .000033  | -.261988 | -.000212 | .000041 | .000001  |
| 29    | .013571 | .000032  | -.284426 | -.000203 | .000061 | .000001  |
| 30    | .013462 | .000024  | -.303814 | -.000156 | .000076 | .000000  |
| 31    | .013400 | .000012  | -.316771 | -.000084 | .000086 | .000000  |
| 32    | .013380 | .000000  | -.321307 | .000000  | .000089 | .000000  |
| 33    | .013400 | -.000012 | -.316771 | .000084  | .000086 | -.000000 |
| 34    | .013462 | -.000024 | -.303814 | .000156  | .000076 | -.000000 |
| 35    | .013571 | -.000032 | -.284426 | .000203  | .000061 | -.000001 |
| 36    | .013734 | -.000033 | -.261988 | .000212  | .000041 | -.000001 |
| 37    | .013660 | .000073  | -.265154 | -.000223 | .000040 | .000001  |
| 38    | .013520 | .000062  | -.289031 | -.000215 | .000056 | .000000  |
| 39    | .013431 | .000044  | -.309538 | -.000165 | .000069 | .000000  |
| 40    | .013380 | .000023  | -.323186 | -.000089 | .000077 | .000000  |
| 41    | .013364 | .000000  | -.327959 | .000000  | .000080 | .000000  |
| 42    | .013380 | -.000023 | -.323186 | .000089  | .000077 | -.000000 |
| 43    | .013431 | -.000044 | -.309538 | .000165  | .000069 | -.000000 |
| 44    | .013520 | -.000062 | -.289031 | .000215  | .000056 | -.000000 |
| 45    | .013660 | -.000073 | -.265154 | .000223  | .000040 | -.000001 |
| 46    | .013546 | .000092  | -.268272 | -.000234 | .000037 | .000000  |
| 47    | .013460 | .000080  | -.293001 | -.000223 | .000044 | .000000  |
| 48    | .013394 | .000058  | -.314318 | -.000171 | .000053 | .000000  |
| 49    | .013355 | .000030  | -.328518 | -.000092 | .000059 | .000000  |
| 50    | .013343 | .000000  | -.333481 | .000000  | .000061 | .000000  |
| 51    | .013355 | -.000030 | -.328518 | .000092  | .000059 | -.000000 |
| 52    | .013394 | -.000058 | -.314318 | .000171  | .000053 | -.000000 |
| 53    | .013460 | -.000080 | -.293001 | .000223  | .000044 | -.000000 |
| 54    | .013546 | -.000092 | -.268272 | .000234  | .000037 | -.000000 |
| 55    | .013451 | .000101  | -.270597 | -.000237 | .000025 | .000000  |
| 56    | .013395 | .000089  | -.295872 | -.000229 | .000031 | .000000  |
| 57    | .013352 | .000065  | -.317712 | -.000176 | .000036 | .000000  |
| 58    | .013327 | .000034  | -.332284 | -.000095 | .000039 | .000000  |
| 59    | .013319 | .000000  | -.337383 | .000000  | .000041 | .000000  |
| 60    | .013327 | -.000034 | -.332284 | .000095  | .000039 | .000000  |
| 61    | .013352 | -.000065 | -.317712 | .000176  | .000036 | -.000000 |
| 62    | .013395 | -.000089 | -.295872 | .000229  | .000031 | -.000000 |
| 63    | .013451 | -.000101 | -.270597 | .000237  | .000025 | -.000000 |
| 64    | .013352 | .000106  | -.272439 | -.000239 | .000023 | .000000  |
| 65    | .013327 | .000093  | -.297959 | -.000231 | .000025 | .000000  |
| 66    | .013307 | .000069  | -.320052 | -.000178 | .000026 | .000000  |
| 67    | .013296 | .000036  | -.334832 | -.000096 | .000028 | .000000  |
| 68    | .013292 | .000000  | -.340011 | .000000  | .000029 | .000000  |
| 69    | .013296 | -.000036 | -.334832 | .000096  | .000028 | .000000  |
| 70    | .013307 | -.000069 | -.320052 | .000178  | .000026 | .000000  |
| 71    | .013327 | -.000093 | -.297959 | .000231  | .000025 | .000000  |
| 72    | .013352 | -.000106 | -.272439 | .000239  | .000023 | .000000  |
| 73    | .013252 | .000105  | -.274249 | -.000242 | .000022 | .000000  |
| 74    | .013257 | .000094  | -.299780 | -.000231 | .000023 | .000000  |
| 75    | .013261 | .000069  | -.321939 | -.000179 | .000023 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 2 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)    | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|---------|----------|----------|----------|----------|----------|
| 76    | .013263 | .000037  | -.336797 | -.000097 | .000023  | .000000  |
| 77    | .013264 | .000000  | -.342005 | .000000  | .000023  | .000000  |
| 78    | .013263 | -.000037 | -.336797 | .000097  | .000023  | .000000  |
| 79    | .013261 | -.000069 | -.321939 | .000179  | .000023  | .000000  |
| 80    | .013257 | -.000094 | -.299780 | .000231  | .000023  | .000000  |
| 81    | .013252 | -.000105 | -.274249 | .000242  | .000022  | .000000  |
| 82    | .013151 | .000104  | -.275855 | -.000240 | .000021  | .000000  |
| 83    | .013188 | .000092  | -.301457 | -.000232 | .000021  | -.000000 |
| 84    | .013215 | .000068  | -.323613 | -.000179 | .000020  | .000000  |
| 85    | .013231 | .000036  | -.338434 | -.000096 | .000018  | .000000  |
| 86    | .013236 | .000000  | -.343626 | .000000  | .000018  | .000000  |
| 87    | .013231 | -.000036 | -.338434 | .000096  | .000018  | .000000  |
| 88    | .013215 | -.000068 | -.323613 | .000179  | .000020  | .000000  |
| 89    | .013188 | -.000092 | -.301457 | .000232  | .000021  | .000000  |
| 90    | .013151 | -.000104 | -.275855 | .000240  | .000021  | .000000  |
| 91    | .013054 | .000097  | -.277464 | -.000238 | .000019  | -.000000 |
| 92    | .013121 | .000086  | -.302878 | -.000230 | .000015  | -.000000 |
| 93    | .013171 | .000063  | -.324839 | -.000177 | .000010  | -.000000 |
| 94    | .013200 | .000033  | -.339489 | -.000095 | .000007  | .000000  |
| 95    | .013210 | .000000  | -.344616 | .000000  | .000006  | .000000  |
| 96    | .013200 | -.000033 | -.339489 | .000095  | .000007  | .000000  |
| 97    | .013171 | -.000063 | -.324839 | .000177  | .000010  | .000000  |
| 98    | .013121 | -.000086 | -.302878 | .000230  | .000015  | .000000  |
| 99    | .013054 | -.000097 | -.277464 | .000238  | .000019  | .000000  |
| 100   | .012963 | .000086  | -.278584 | -.000236 | .000008  | -.000000 |
| 101   | .013058 | .000075  | -.303524 | -.000225 | .000001  | -.000000 |
| 102   | .013130 | .000054  | -.325017 | -.000173 | -.000007 | -.000000 |
| 103   | .013172 | .000028  | -.339332 | -.000093 | -.000012 | -.000000 |
| 104   | .013186 | .000000  | -.344336 | .000000  | -.000014 | .000000  |
| 105   | .013172 | -.000028 | -.339332 | .000093  | -.000012 | .000000  |
| 106   | .013130 | -.000054 | -.325017 | .000173  | -.000007 | .000000  |
| 107   | .013058 | -.000075 | -.303524 | .000225  | .000001  | .000000  |
| 108   | .012963 | -.000086 | -.278584 | .000236  | .000008  | .000000  |
| 109   | .012851 | .000065  | -.278919 | -.000226 | .000005  | -.000001 |
| 110   | .012999 | .000055  | -.303078 | -.000218 | -.000011 | -.000001 |
| 111   | .013095 | .000039  | -.323815 | -.000167 | -.000023 | -.000000 |
| 112   | .013149 | .000020  | -.337612 | -.000090 | -.000031 | -.000000 |
| 113   | .013167 | .000000  | -.342437 | .000000  | -.000033 | .000000  |
| 114   | .013149 | -.000020 | -.337612 | .000090  | -.000031 | .000000  |
| 115   | .013095 | -.000039 | -.323815 | .000167  | -.000023 | .000000  |
| 116   | .012999 | -.000055 | -.303078 | .000218  | -.000011 | .000001  |
| 117   | .012851 | -.000065 | -.278919 | .000226  | .000005  | .000001  |
| 118   | .012780 | .000022  | -.279235 | -.000215 | .000004  | -.000001 |
| 119   | .012951 | .000022  | -.302005 | -.000206 | -.000015 | -.000001 |
| 120   | .013065 | .000016  | -.321669 | -.000158 | -.000030 | -.000000 |
| 121   | .013131 | .000008  | -.334805 | -.000085 | -.000039 | -.000000 |
| 122   | .013152 | .000000  | -.339404 | .000000  | -.000042 | .000000  |
| 123   | .013131 | -.000008 | -.334805 | .000085  | -.000039 | .000000  |
| 124   | .013065 | -.000016 | -.321669 | .000158  | -.000030 | .000000  |
| 125   | .012951 | -.000022 | -.302005 | .000206  | -.000015 | .000001  |
| 126   | .012780 | -.000022 | -.279235 | .000215  | .000004  | .000001  |
| 127   | .012744 | -.000022 | -.279268 | -.000206 | -.000003 | -.000001 |
| 128   | .012913 | -.000020 | -.300778 | -.000194 | -.000016 | -.000001 |
| 129   | .013043 | -.000016 | -.319307 | -.000150 | -.000029 | -.000001 |
| 130   | .013118 | -.000009 | -.331711 | -.000081 | -.000039 | -.000000 |
| 131   | .013142 | .000000  | -.336060 | .000000  | -.000042 | .000000  |
| 132   | .013118 | .000009  | -.331711 | .000081  | -.000039 | .000000  |
| 133   | .013043 | .000016  | -.319307 | .000150  | -.000029 | .000001  |
| 134   | .012913 | .000020  | -.300778 | .000194  | -.000016 | .000001  |
| 135   | .012744 | .000022  | -.279268 | .000206  | -.000003 | .000001  |
| 136   | .012682 | -.000100 | -.279280 | -.000194 | .000005  | -.000002 |
| 137   | .012883 | -.000092 | -.299713 | -.000184 | -.000011 | -.000001 |
| 138   | .013027 | -.000068 | -.317177 | -.000141 | -.000025 | -.000001 |
| 139   | .013109 | -.000036 | -.328846 | -.000076 | -.000034 | -.000000 |
| 140   | .013136 | .000000  | -.332940 | .000000  | -.000037 | .000000  |
| 141   | .013109 | .000036  | -.328846 | .000076  | -.000034 | .000000  |
| 142   | .013027 | .000068  | -.317177 | .000141  | -.000025 | .000001  |
| 143   | .012883 | .000092  | -.299713 | .000184  | -.000011 | .000001  |
| 144   | .012682 | .000100  | -.279280 | .000194  | .000005  | .000002  |
| 145   | .012667 | -.000286 | -.280246 | -.000179 | .000007  | -.000002 |
| 146   | .012865 | -.000249 | -.298536 | -.000164 | -.000007 | -.000002 |
| 147   | .013017 | -.000180 | -.314031 | -.000126 | -.000020 | -.000001 |
| 148   | .013104 | -.000093 | -.324411 | -.000068 | -.000028 | -.000001 |
| 149   | .013133 | .000000  | -.328060 | .000000  | -.000031 | .000000  |
| 150   | .013104 | .000093  | -.324411 | .000068  | -.000028 | .000001  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 2 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|----------|----------|----------|----------|----------|----------|
| 151   | .013017  | .000180  | -.314031 | .000126  | -.000020 | .000001  |
| 152   | .012865  | .000249  | -.298536 | .000164  | -.000007 | .000002  |
| 153   | .012667  | .000286  | -.280246 | .000179  | .000007  | .000002  |
| 154   | .000000  | .000000  | -.247440 | .000202  | .000026  | .000001  |
| 155   | .002693  | -.018513 | -.248022 | .000116  | .000021  | -.000001 |
| 156   | .005018  | -.027222 | -.248486 | .000034  | .000020  | -.000002 |
| 157   | .007349  | -.026639 | -.248797 | -.000043 | .000022  | -.000003 |
| 158   | .010138  | -.017290 | -.248958 | -.000115 | .000028  | -.000004 |
| 159   | -.000207 | .000046  | -.252253 | .000203  | .000030  | -.000001 |
| 160   | .002727  | -.018631 | -.252685 | .000117  | .000022  | -.000001 |
| 161   | .005046  | -.027518 | -.253177 | .000035  | .000019  | -.000002 |
| 162   | .007336  | -.027111 | -.253747 | -.000042 | .000021  | -.000003 |
| 163   | .010072  | -.017900 | -.254394 | -.000115 | .000027  | -.000003 |
| 164   | -.000261 | -.000008 | -.258327 | .000210  | .000034  | -.000001 |
| 165   | .002828  | -.019711 | -.259422 | .000127  | .000022  | -.000001 |
| 166   | .005055  | -.029756 | -.260342 | .000044  | .000018  | -.000002 |
| 167   | .007181  | -.029940 | -.261070 | -.000041 | .000020  | -.000003 |
| 168   | .009832  | -.020019 | -.261607 | -.000128 | .000027  | -.000004 |
| 169   | -.000229 | -.000042 | -.260922 | .000208  | .000030  | -.000000 |
| 170   | .002777  | -.019755 | -.261406 | .000128  | .000022  | -.000001 |
| 171   | .005055  | -.029882 | -.262064 | .000045  | .000018  | -.000002 |
| 172   | .007186  | -.030146 | -.262915 | -.000041 | .000020  | -.000003 |
| 173   | .009829  | -.020313 | -.263957 | -.000128 | .000027  | -.000004 |
| 174   | -.000134 | -.000075 | -.266208 | .000212  | .000030  | .000000  |
| 175   | .002909  | -.020492 | -.267130 | .000135  | .000024  | -.000002 |
| 176   | .005567  | -.031380 | -.268041 | .000050  | .000022  | -.000002 |
| 177   | .008123  | -.031999 | -.268921 | -.000040 | .000022  | -.000002 |
| 178   | .010690  | -.021705 | -.269770 | -.000137 | .000022  | -.000001 |
| 179   | -.000044 | -.000069 | -.268200 | .000217  | .000024  | .000000  |
| 180   | .002852  | -.020656 | -.269004 | .000135  | .000024  | -.000002 |
| 181   | .005564  | -.031521 | -.269819 | .000050  | .000022  | -.000002 |
| 182   | .008129  | -.032120 | -.270663 | -.000041 | .000022  | -.000002 |
| 183   | .010692  | -.021807 | -.271540 | -.000137 | .000022  | -.000001 |
| 184   | .000060  | -.000065 | -.271577 | .000219  | .000020  | .000000  |
| 185   | .002413  | -.020822 | -.272362 | .000136  | .000021  | .000001  |
| 186   | .005012  | -.031755 | -.273171 | .000050  | .000023  | .000001  |
| 187   | .007789  | -.032323 | -.274025 | -.000041 | .000024  | .000001  |
| 188   | .010552  | -.021917 | -.274923 | -.000138 | .000023  | .000001  |
| 189   | .000155  | -.000065 | -.273010 | .000215  | .000014  | .000000  |
| 190   | .002348  | -.020708 | -.273971 | .000136  | .000022  | .000001  |
| 191   | .005009  | -.031657 | -.274908 | .000050  | .000023  | .000001  |
| 192   | .007795  | -.032239 | -.275801 | -.000041 | .000024  | .000001  |
| 193   | .010553  | -.021845 | -.276649 | -.000137 | .000023  | .000001  |
| 194   | .000240  | -.000024 | -.274574 | .000214  | .000015  | .000000  |
| 195   | .002527  | -.020295 | -.275070 | .000131  | .000023  | .000000  |
| 196   | .005569  | -.030609 | -.275747 | .000045  | .000027  | .000001  |
| 197   | .008753  | -.030772 | -.276621 | -.000043 | .000025  | .000002  |
| 198   | .011412  | -.020659 | -.277690 | -.000131 | .000018  | .000003  |
| 199   | .000258  | .000013  | -.275472 | .000217  | .000012  | .000001  |
| 200   | .002487  | -.020294 | -.276597 | .000131  | .000024  | .000000  |
| 201   | .005569  | -.030520 | -.277543 | .000044  | .000027  | .000001  |
| 202   | .008758  | -.030596 | -.278290 | -.000043 | .000025  | .000002  |
| 203   | .011407  | -.020391 | -.278842 | -.000131 | .000018  | .000003  |
| 204   | .000188  | .000054  | -.276385 | .000212  | .000015  | .000000  |
| 205   | .002574  | -.019438 | -.276799 | .000122  | .000024  | .000000  |
| 206   | .005595  | -.028615 | -.277285 | .000036  | .000026  | .000001  |
| 207   | .008640  | -.028077 | -.277867 | -.000045 | .000024  | .000002  |
| 208   | .011208  | -.018441 | -.278541 | -.000120 | .000018  | .000003  |
| 209   | .000000  | .000000  | -.278620 | .000213  | .000019  | -.000001 |
| 210   | .002591  | -.019428 | -.279292 | .000121  | .000024  | .000000  |
| 211   | .005613  | -.028463 | -.279811 | .000035  | .000026  | .000001  |
| 212   | .008632  | -.027782 | -.280131 | -.000045 | .000024  | .000002  |
| 213   | .011159  | -.018020 | -.280257 | -.000120 | .000017  | .000003  |
| 214   | -.000167 | -.000058 | -.263370 | .000213  | .000036  | -.000000 |
| 215   | .000182  | -.000044 | -.273572 | .000219  | .000009  | .000001  |
| 216   | .000000  | .000000  | -.247440 | -.000202 | .000026  | -.000001 |
| 217   | .002693  | .018513  | -.248022 | -.000116 | .000021  | .000001  |
| 218   | .005018  | .027222  | -.248486 | -.000034 | .000020  | .000002  |
| 219   | .007349  | .026639  | -.248797 | .000043  | .000022  | .000003  |
| 220   | .010138  | .017290  | -.248958 | .000115  | .000028  | .000004  |
| 221   | -.000207 | -.000046 | -.252253 | -.000203 | .000030  | .000001  |
| 222   | .002727  | .018631  | -.252685 | -.000117 | .000022  | .000001  |
| 223   | .005046  | .027518  | -.253177 | -.000035 | .000019  | .000002  |
| 224   | .007336  | .027111  | -.253747 | .000042  | .000021  | .000003  |
| 225   | .010072  | .017900  | -.254394 | .000115  | .000027  | .000003  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 2 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|----------|----------|----------|----------|---------|----------|
| 226   | -.000261 | .000008  | -.258327 | -.000210 | .000034 | .000001  |
| 227   | .002828  | .019711  | -.259422 | -.000127 | .000022 | .000001  |
| 228   | .005055  | .029756  | -.260342 | -.000044 | .000018 | .000002  |
| 229   | .007181  | .029940  | -.261070 | .000041  | .000020 | .000003  |
| 230   | .009832  | .020019  | -.261607 | .000128  | .000027 | .000004  |
| 231   | -.000229 | .000042  | -.260922 | -.000208 | .000030 | .000000  |
| 232   | .002777  | .019755  | -.261406 | -.000128 | .000022 | .000001  |
| 233   | .005055  | .029882  | -.262064 | -.000045 | .000018 | .000002  |
| 234   | .007186  | .030146  | -.262915 | .000041  | .000020 | .000003  |
| 235   | .009829  | .020313  | -.263957 | .000128  | .000027 | .000004  |
| 236   | -.000134 | .000075  | -.266208 | -.000212 | .000030 | .000000  |
| 237   | .002909  | .020492  | -.267130 | -.000135 | .000024 | .000002  |
| 238   | .005567  | .031380  | -.268041 | -.000050 | .000022 | .000002  |
| 239   | .008123  | .031999  | -.268921 | .000040  | .000022 | .000002  |
| 240   | .010690  | .021705  | -.269770 | .000137  | .000022 | .000001  |
| 241   | -.000044 | .000069  | -.268200 | -.000217 | .000024 | .000000  |
| 242   | .002852  | .020656  | -.269004 | -.000135 | .000024 | .000002  |
| 243   | .005564  | .031521  | -.269819 | -.000050 | .000022 | .000002  |
| 244   | .008129  | .032120  | -.270663 | .000041  | .000022 | .000002  |
| 245   | .010692  | .021807  | -.271540 | .000137  | .000022 | .000001  |
| 246   | .000060  | .000065  | -.271577 | -.000219 | .000020 | -.000000 |
| 247   | .002413  | .020822  | -.272362 | -.000136 | .000021 | -.000001 |
| 248   | .005012  | .031755  | -.273171 | -.000050 | .000023 | -.000001 |
| 249   | .007789  | .032323  | -.274025 | .000041  | .000024 | -.000001 |
| 250   | .010552  | .021917  | -.274923 | .000138  | .000023 | -.000001 |
| 251   | .000155  | .000065  | -.273010 | -.000215 | .000014 | .000000  |
| 252   | .002348  | .020708  | -.273971 | -.000136 | .000022 | -.000001 |
| 253   | .005009  | .031657  | -.274908 | -.000050 | .000023 | -.000001 |
| 254   | .007795  | .032239  | -.275801 | .000041  | .000024 | -.000001 |
| 255   | .010553  | .021845  | -.276649 | .000137  | .000023 | -.000001 |
| 256   | .000240  | .000024  | -.274574 | -.000214 | .000015 | -.000000 |
| 257   | .002527  | .020295  | -.275070 | -.000131 | .000023 | .000000  |
| 258   | .005569  | .030609  | -.275747 | -.000045 | .000027 | -.000001 |
| 259   | .008753  | .030772  | -.276621 | .000043  | .000025 | -.000002 |
| 260   | .011412  | .020659  | -.277690 | .000131  | .000018 | -.000003 |
| 261   | .000258  | -.000013 | -.275472 | -.000217 | .000012 | -.000001 |
| 262   | .002487  | .020294  | -.276597 | -.000131 | .000024 | .000000  |
| 263   | .005569  | .030520  | -.277543 | -.000044 | .000027 | -.000001 |
| 264   | .008758  | .030596  | -.278290 | .000043  | .000025 | -.000002 |
| 265   | .011407  | .020391  | -.278842 | .000131  | .000018 | -.000003 |
| 266   | .000188  | -.000054 | -.276385 | -.000212 | .000015 | -.000000 |
| 267   | .002574  | .019438  | -.276799 | -.000122 | .000024 | -.000000 |
| 268   | .005595  | .028615  | -.277285 | -.000036 | .000026 | -.000001 |
| 269   | .008640  | .028077  | -.277867 | .000045  | .000024 | -.000002 |
| 270   | .011208  | .018441  | -.278541 | .000120  | .000018 | -.000003 |
| 271   | .000000  | .000000  | -.278620 | -.000213 | .000019 | .000001  |
| 272   | .002591  | .019428  | -.279292 | -.000121 | .000024 | .000000  |
| 273   | .005613  | .028463  | -.279811 | -.000035 | .000026 | -.000001 |
| 274   | .008632  | .027782  | -.280131 | .000045  | .000024 | -.000002 |
| 275   | .011159  | .018020  | -.280257 | .000120  | .000017 | -.000003 |
| 276   | -.000167 | .000058  | -.263370 | -.000213 | .000036 | .000000  |
| 277   | .000182  | .000044  | -.273572 | -.000219 | .000009 | -.000001 |
| 278   | -.000089 | .000014  | -.226082 | .000193  | .000028 | .000001  |
| 279   | -.000103 | .000020  | -.207736 | .000148  | .000029 | .000000  |
| 280   | -.000085 | .000013  | -.195515 | .000080  | .000029 | -.000000 |
| 281   | -.000076 | .000000  | -.191241 | .000000  | .000029 | .000000  |
| 282   | -.000085 | -.000013 | -.195515 | -.000080 | .000029 | .000000  |
| 283   | -.000103 | -.000020 | -.207736 | -.000148 | .000029 | .000000  |
| 284   | -.000089 | -.000014 | -.226082 | -.000193 | .000028 | -.000001 |
| 285   | -.000140 | .000040  | -.230687 | .000193  | .000032 | -.000000 |
| 286   | -.000097 | .000025  | -.212295 | .000148  | .000030 | -.000000 |
| 287   | -.000074 | .000012  | -.200002 | .000080  | .000029 | -.000000 |
| 288   | -.000066 | .000000  | -.195699 | .000000  | .000029 | .000000  |
| 289   | -.000074 | -.000012 | -.200002 | -.000080 | .000029 | .000000  |
| 290   | -.000097 | -.000025 | -.212295 | -.000148 | .000030 | .000000  |
| 291   | -.000140 | -.000040 | -.230687 | -.000193 | .000032 | .000000  |
| 292   | -.000152 | -.000002 | -.235870 | .000199  | .000033 | -.000001 |
| 293   | -.000086 | -.000001 | -.216962 | .000152  | .000030 | -.000000 |
| 294   | -.000057 | -.000001 | -.204438 | .000081  | .000029 | -.000000 |
| 295   | -.000049 | .000000  | -.200066 | .000000  | .000028 | .000000  |
| 296   | -.000057 | .000001  | -.204438 | -.000081 | .000029 | .000000  |
| 297   | -.000086 | .000001  | -.216962 | -.000152 | .000030 | .000000  |
| 298   | -.000152 | .000002  | -.235870 | -.000199 | .000033 | .000001  |
| 299   | -.000105 | -.000045 | -.240662 | .000202  | .000031 | -.000000 |
| 300   | -.000060 | -.000030 | -.221459 | .000155  | .000028 | -.000000 |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 2 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|----------|----------|----------|----------|---------|----------|
| 301   | -.000037 | -.000015 | -.208670 | .000083  | .000026 | -.000000 |
| 302   | -.000030 | .000000  | -.204200 | .000000  | .000026 | .000000  |
| 303   | -.000037 | .000015  | -.208670 | -.000083 | .000026 | .000000  |
| 304   | -.000060 | .000030  | -.221459 | -.000155 | .000028 | .000000  |
| 305   | -.000105 | .000045  | -.240662 | -.000202 | .000031 | .000000  |
| 306   | -.000032 | -.000058 | -.245025 | .000207  | .000025 | -.000000 |
| 307   | -.000020 | -.000042 | -.225404 | .000158  | .000023 | .000000  |
| 308   | -.000012 | -.000022 | -.212377 | .000085  | .000022 | .000000  |
| 309   | -.000010 | .000000  | -.207829 | .000000  | .000022 | .000000  |
| 310   | -.000012 | .000022  | -.212377 | -.000085 | .000022 | .000000  |
| 311   | -.000020 | .000042  | -.225404 | -.000158 | .000023 | .000000  |
| 312   | -.000032 | .000058  | -.245025 | -.000207 | .000025 | .000000  |
| 313   | .000042  | -.000057 | -.248281 | .000208  | .000018 | .000000  |
| 314   | .000025  | -.000041 | -.228507 | .000159  | .000017 | .000000  |
| 315   | .000015  | -.000021 | -.215371 | .000085  | .000017 | .000000  |
| 316   | .000012  | .000000  | -.210785 | .000000  | .000017 | .000000  |
| 317   | .000015  | .000021  | -.215371 | -.000085 | .000017 | .000000  |
| 318   | .000025  | .000041  | -.228507 | -.000159 | .000017 | -.000000 |
| 319   | .000042  | .000057  | -.248281 | -.000208 | .000018 | -.000000 |
| 320   | .000112  | -.000040 | -.250479 | .000207  | .000012 | .000001  |
| 321   | .000064  | -.000027 | -.230801 | .000158  | .000013 | .000000  |
| 322   | .000039  | -.000014 | -.217697 | .000085  | .000013 | .000000  |
| 323   | .000032  | .000000  | -.213117 | .000000  | .000014 | .000000  |
| 324   | .000039  | .000014  | -.217697 | -.000085 | .000013 | -.000000 |
| 325   | .000064  | .000027  | -.230801 | -.000158 | .000013 | -.000000 |
| 326   | .000112  | .000040  | -.250479 | -.000207 | .000012 | -.000001 |
| 327   | .000152  | .000004  | -.252309 | .000207  | .000011 | .000001  |
| 328   | .000088  | .000003  | -.232664 | .000158  | .000012 | .000000  |
| 329   | .000059  | .000001  | -.219637 | .000085  | .000012 | .000000  |
| 330   | .000051  | .000000  | -.215088 | .000000  | .000012 | .000000  |
| 331   | .000059  | -.000001 | -.219637 | -.000085 | .000012 | -.000000 |
| 332   | .000088  | -.000003 | -.232664 | -.000158 | .000012 | -.000000 |
| 333   | .000152  | -.000004 | -.252309 | -.000207 | .000011 | -.000001 |
| 334   | .000136  | .000042  | -.253848 | .000203  | .000013 | .000000  |
| 335   | .000098  | .000026  | -.234507 | .000156  | .000013 | .000000  |
| 336   | .000075  | .000012  | -.221551 | .000084  | .000013 | .000000  |
| 337   | .000067  | .000000  | -.217011 | .000000  | .000013 | .000000  |
| 338   | .000075  | -.000012 | -.221551 | -.000084 | .000013 | -.000000 |
| 339   | .000098  | -.000026 | -.234507 | -.000156 | .000013 | -.000000 |
| 340   | .000136  | -.000042 | -.253848 | -.000203 | .000013 | -.000000 |
| 341   | .000093  | .000014  | -.256022 | .000204  | .000015 | -.000001 |
| 342   | .000104  | .000021  | -.236542 | .000157  | .000014 | .000000  |
| 343   | .000084  | .000014  | -.223539 | .000085  | .000013 | .000000  |
| 344   | .000075  | .000000  | -.218988 | .000000  | .000013 | .000000  |
| 345   | .000084  | -.000014 | -.223539 | -.000085 | .000013 | -.000000 |
| 346   | .000104  | -.000021 | -.236542 | -.000157 | .000014 | .000000  |
| 347   | .000093  | -.000014 | -.256022 | -.000204 | .000015 | .000001  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 3 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)    | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|---------|----------|----------|----------|---------|----------|
| 1     | .007060 | -.000127 | -.109247 | -.000089 | .000020 | .000001  |
| 2     | .006959 | -.000111 | -.118297 | -.000081 | .000029 | .000001  |
| 3     | .006881 | -.000081 | -.125959 | -.000063 | .000037 | .000001  |
| 4     | .006836 | -.000042 | -.131110 | -.000034 | .000043 | .000000  |
| 5     | .006822 | .000000  | -.132926 | .000000  | .000045 | .000000  |
| 6     | .006836 | .000042  | -.131110 | .000034  | .000043 | -.000000 |
| 7     | .006881 | .000081  | -.125959 | .000063  | .000037 | -.000001 |
| 8     | .006959 | .000111  | -.118297 | .000081  | .000029 | -.000001 |
| 9     | .007060 | .000127  | -.109247 | .000089  | .000020 | -.000001 |
| 10    | .007043 | -.000026 | -.112440 | -.000101 | .000020 | .000001  |
| 11    | .006946 | -.000028 | -.123089 | -.000096 | .000031 | .000001  |
| 12    | .006874 | -.000021 | -.132274 | -.000074 | .000041 | .000000  |
| 13    | .006833 | -.000012 | -.138452 | -.000040 | .000048 | .000000  |
| 14    | .006819 | .000000  | -.140625 | .000000  | .000050 | .000000  |
| 15    | .006833 | .000012  | -.138452 | .000040  | .000048 | -.000000 |
| 16    | .006874 | .000021  | -.132274 | .000074  | .000041 | -.000000 |
| 17    | .006946 | .000028  | -.123089 | .000096  | .000031 | -.000001 |
| 18    | .007043 | .000026  | -.112440 | .000101  | .000020 | -.000001 |
| 19    | .007009 | .000011  | -.114172 | -.000109 | .000023 | .000000  |
| 20    | .006928 | .000008  | -.125611 | -.000104 | .000033 | .000000  |
| 21    | .006865 | .000005  | -.135571 | -.000081 | .000044 | .000000  |
| 22    | .006828 | .000002  | -.142283 | -.000044 | .000050 | .000000  |
| 23    | .006816 | .000000  | -.144643 | .000000  | .000053 | .000000  |
| 24    | .006828 | -.000002 | -.142283 | .000044  | .000050 | -.000000 |
| 25    | .006865 | -.000005 | -.135571 | .000081  | .000044 | -.000000 |
| 26    | .006928 | -.000008 | -.125611 | .000104  | .000033 | -.000000 |
| 27    | .007009 | -.000011 | -.114172 | .000109  | .000023 | -.000000 |
| 28    | .006987 | .000033  | -.115842 | -.000115 | .000020 | .000000  |
| 29    | .006907 | .000028  | -.128164 | -.000113 | .000032 | .000000  |
| 30    | .006852 | .000020  | -.138993 | -.000087 | .000044 | .000000  |
| 31    | .006820 | .000010  | -.146218 | -.000047 | .000050 | .000000  |
| 32    | .006810 | .000000  | -.148792 | .000000  | .000053 | .000000  |
| 33    | .006820 | -.000010 | -.146218 | .000047  | .000050 | -.000000 |
| 34    | .006852 | -.000020 | -.138993 | .000087  | .000044 | -.000000 |
| 35    | .006907 | -.000028 | -.128164 | .000113  | .000032 | -.000000 |
| 36    | .006987 | -.000033 | -.115842 | .000115  | .000020 | -.000000 |
| 37    | .006950 | .000053  | -.117333 | -.000123 | .000019 | .000000  |
| 38    | .006882 | .000043  | -.130564 | -.000121 | .000029 | .000000  |
| 39    | .006836 | .000030  | -.142241 | -.000093 | .000038 | .000000  |
| 40    | .006810 | .000016  | -.149900 | -.000050 | .000044 | .000000  |
| 41    | .006802 | .000000  | -.152704 | .000000  | .000046 | .000000  |
| 42    | .006810 | -.000016 | -.149900 | .000050  | .000044 | .000000  |
| 43    | .006836 | -.000030 | -.142241 | .000093  | .000038 | -.000000 |
| 44    | .006882 | -.000043 | -.130564 | .000121  | .000029 | -.000000 |
| 45    | .006950 | -.000053 | -.117333 | .000123  | .000019 | -.000000 |
| 46    | .006896 | .000061  | -.118853 | -.000129 | .000019 | .000000  |
| 47    | .006851 | .000053  | -.132662 | -.000127 | .000024 | .000000  |
| 48    | .006817 | .000037  | -.144874 | -.000098 | .000030 | .000000  |
| 49    | .006798 | .000019  | -.152953 | -.000053 | .000034 | .000000  |
| 50    | .006791 | .000000  | -.155864 | .000000  | .000036 | .000000  |
| 51    | .006798 | -.000019 | -.152953 | .000053  | .000034 | .000000  |
| 52    | .006817 | -.000037 | -.144874 | .000098  | .000030 | -.000000 |
| 53    | .006851 | -.000053 | -.132662 | .000127  | .000024 | -.000000 |
| 54    | .006896 | -.000061 | -.118853 | .000129  | .000019 | -.000000 |
| 55    | .006851 | .000069  | -.120123 | -.000132 | .000014 | .000000  |
| 56    | .006818 | .000058  | -.134330 | -.000131 | .000019 | .000000  |
| 57    | .006796 | .000042  | -.146937 | -.000101 | .000022 | .000000  |
| 58    | .006783 | .000022  | -.155246 | -.000055 | .000024 | .000000  |
| 59    | .006779 | .000000  | -.158280 | .000000  | .000025 | .000000  |
| 60    | .006783 | -.000022 | -.155246 | .000055  | .000024 | .000000  |
| 61    | .006796 | -.000042 | -.146937 | .000101  | .000022 | .000000  |
| 62    | .006818 | -.000058 | -.134330 | .000131  | .000019 | -.000000 |
| 63    | .006851 | -.000069 | -.120123 | .000132  | .000014 | -.000000 |
| 64    | .006798 | .000074  | -.121187 | -.000134 | .000013 | .000000  |
| 65    | .006784 | .000062  | -.135599 | -.000132 | .000014 | .000000  |
| 66    | .006773 | .000044  | -.148305 | -.000103 | .000015 | .000000  |
| 67    | .006767 | .000023  | -.156816 | -.000056 | .000017 | .000000  |
| 68    | .006765 | .000000  | -.159843 | .000000  | .000016 | .000000  |
| 69    | .006767 | -.000023 | -.156816 | .000056  | .000017 | .000000  |
| 70    | .006773 | -.000044 | -.148305 | .000103  | .000015 | .000000  |
| 71    | .006784 | -.000062 | -.135599 | .000132  | .000014 | .000000  |
| 72    | .006798 | -.000074 | -.121187 | .000134  | .000013 | .000000  |
| 73    | .006745 | .000072  | -.122161 | -.000136 | .000011 | .000000  |
| 74    | .006748 | .000062  | -.136607 | -.000132 | .000012 | .000000  |
| 75    | .006750 | .000045  | -.149321 | -.000103 | .000012 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 3 - D I S P L A C E M E N T S "U" A N D R O T A T I O N S "R"

| JOINT | U(X)    | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|---------|----------|----------|----------|----------|----------|
| 76    | .006751 | .000023  | -.157910 | -.000056 | .000012  | .000000  |
| 77    | .006751 | .000000  | -.160931 | .000000  | .000012  | .000000  |
| 78    | .006751 | -.000023 | -.157910 | .000056  | .000012  | .000000  |
| 79    | .006750 | -.000045 | -.149321 | .000103  | .000012  | .000000  |
| 80    | .006748 | -.000062 | -.136607 | .000132  | .000012  | .000000  |
| 81    | .006745 | -.000072 | -.122161 | .000136  | .000011  | .000000  |
| 82    | .006692 | .000073  | -.122926 | -.000134 | .000009  | .000000  |
| 83    | .006712 | .000061  | -.137391 | -.000132 | .000009  | .000000  |
| 84    | .006727 | .000044  | -.150139 | -.000103 | .000009  | .000000  |
| 85    | .006735 | .000023  | -.158677 | -.000056 | .000007  | .000000  |
| 86    | .006737 | .000000  | -.161714 | .000000  | .000008  | .000000  |
| 87    | .006735 | -.000023 | -.158677 | .000056  | .000007  | .000000  |
| 88    | .006727 | -.000044 | -.150139 | .000103  | .000009  | .000000  |
| 89    | .006712 | -.000061 | -.137391 | .000132  | .000009  | .000000  |
| 90    | .006692 | -.000073 | -.122926 | .000134  | .000009  | .000000  |
| 91    | .006640 | .000067  | -.123619 | -.000133 | .000008  | -.000000 |
| 92    | .006678 | .000057  | -.137920 | -.000131 | .000005  | -.000000 |
| 93    | .006704 | .000041  | -.150608 | -.000102 | .000002  | .000000  |
| 94    | .006719 | .000021  | -.158971 | -.000055 | -.000000 | .000000  |
| 95    | .006724 | .000000  | -.162024 | .000000  | -.000001 | .000000  |
| 96    | .006719 | -.000021 | -.158971 | .000055  | -.000000 | .000000  |
| 97    | .006704 | -.000041 | -.150608 | .000102  | .000002  | .000000  |
| 98    | .006678 | -.000057 | -.137920 | .000131  | .000005  | .000000  |
| 99    | .006640 | -.000067 | -.123619 | .000133  | .000008  | .000000  |
| 100   | .006597 | .000059  | -.124102 | -.000131 | .000004  | -.000000 |
| 101   | .006647 | .000050  | -.138053 | -.000128 | -.000001 | -.000000 |
| 102   | .006684 | .000036  | -.150386 | -.000099 | -.000007 | -.000000 |
| 103   | .006706 | .000018  | -.158545 | -.000053 | -.000010 | .000000  |
| 104   | .006713 | .000000  | -.161484 | .000000  | -.000012 | .000000  |
| 105   | .006706 | -.000018 | -.158545 | .000053  | -.000010 | .000000  |
| 106   | .006684 | -.000036 | -.150386 | .000099  | -.000007 | .000000  |
| 107   | .006647 | -.000050 | -.138053 | .000128  | -.000001 | .000000  |
| 108   | .006597 | -.000059 | -.124102 | .000131  | .000004  | .000000  |
| 109   | .006544 | .000049  | -.124338 | -.000124 | .000004  | -.000000 |
| 110   | .006617 | .000040  | -.137761 | -.000123 | -.000006 | -.000000 |
| 111   | .006666 | .000028  | -.149598 | -.000095 | -.000014 | -.000000 |
| 112   | .006694 | .000014  | -.157362 | -.000051 | -.000020 | .000000  |
| 113   | .006703 | .000000  | -.160203 | .000000  | -.000022 | .000000  |
| 114   | .006694 | -.000014 | -.157362 | .000051  | -.000020 | .000000  |
| 115   | .006666 | -.000028 | -.149598 | .000095  | -.000014 | .000000  |
| 116   | .006617 | -.000040 | -.137761 | .000123  | -.000006 | .000000  |
| 117   | .006544 | -.000049 | -.124338 | .000124  | .000004  | .000000  |
| 118   | .006508 | .000027  | -.124620 | -.000118 | .000003  | -.000000 |
| 119   | .006593 | .000023  | -.137172 | -.000115 | -.000009 | -.000000 |
| 120   | .006651 | .000016  | -.148195 | -.000089 | -.000020 | -.000000 |
| 121   | .006684 | .000008  | -.155549 | -.000048 | -.000026 | -.000000 |
| 122   | .006695 | .000000  | -.158168 | .000000  | -.000029 | .000000  |
| 123   | .006684 | -.000008 | -.155549 | .000048  | -.000026 | .000000  |
| 124   | .006651 | -.000016 | -.148195 | .000089  | -.000020 | .000000  |
| 125   | .006593 | -.000023 | -.137172 | .000115  | -.000009 | .000000  |
| 126   | .006508 | -.000027 | -.124620 | .000118  | .000003  | .000000  |
| 127   | .006488 | .000003  | -.124721 | -.000111 | -.000001 | -.000000 |
| 128   | .006573 | .000002  | -.136428 | -.000106 | -.000010 | -.000000 |
| 129   | .006639 | -.000000 | -.146614 | -.000083 | -.000020 | -.000000 |
| 130   | .006678 | -.000001 | -.153475 | -.000045 | -.000027 | -.000000 |
| 131   | .006690 | .000000  | -.155887 | .000000  | -.000029 | .000000  |
| 132   | .006678 | .000001  | -.153475 | .000045  | -.000027 | .000000  |
| 133   | .006639 | .000000  | -.146614 | .000083  | -.000020 | .000000  |
| 134   | .006573 | -.000002 | -.136428 | .000106  | -.000010 | .000000  |
| 135   | .006488 | -.000003 | -.124721 | .000111  | -.000001 | .000000  |
| 136   | .006455 | -.000035 | -.124747 | -.000104 | .000002  | -.000001 |
| 137   | .006557 | -.000035 | -.135704 | -.000099 | -.000008 | -.000001 |
| 138   | .006631 | -.000027 | -.145140 | -.000076 | -.000018 | -.000000 |
| 139   | .006674 | -.000015 | -.151486 | -.000042 | -.000024 | -.000000 |
| 140   | .006687 | .000000  | -.153718 | .000000  | -.000026 | .000000  |
| 141   | .006674 | .000015  | -.151486 | .000042  | -.000024 | .000000  |
| 142   | .006631 | .000027  | -.145140 | .000076  | -.000018 | .000000  |
| 143   | .006557 | .000035  | -.135704 | .000099  | -.000008 | .000001  |
| 144   | .006455 | .000035  | -.124747 | .000104  | .000002  | .000001  |
| 145   | .006440 | -.000135 | -.125151 | -.000094 | .000003  | -.000001 |
| 146   | .006547 | -.000119 | -.134724 | -.000086 | -.000006 | -.000001 |
| 147   | .006626 | -.000086 | -.142852 | -.000067 | -.000015 | -.000001 |
| 148   | .006672 | -.000045 | -.148322 | -.000036 | -.000020 | -.000000 |
| 149   | .006686 | .000000  | -.150251 | .000000  | -.000022 | .000000  |
| 150   | .006672 | .000045  | -.148322 | .000036  | -.000020 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 3 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|----------|----------|----------|----------|----------|----------|
| 151   | .006626  | .000086  | -.142852 | .000067  | -.000015 | .000001  |
| 152   | .006547  | .000119  | -.134724 | .000086  | -.000006 | .000001  |
| 153   | .006440  | .000135  | -.125151 | .000094  | .000003  | .000001  |
| 154   | .000000  | .000000  | -.108745 | .000092  | .000013  | .000000  |
| 155   | .001339  | -.008635 | -.108986 | .000056  | .000011  | -.000001 |
| 156   | .002498  | -.013064 | -.109165 | .000020  | .000010  | -.000001 |
| 157   | .003676  | -.013147 | -.109263 | -.000018 | .000011  | -.000002 |
| 158   | .005108  | -.008754 | -.109283 | -.000057 | .000014  | -.000002 |
| 159   | -.000104 | .000012  | -.111162 | .000092  | .000015  | -.000000 |
| 160   | .001354  | -.008732 | -.111346 | .000057  | .000011  | -.000001 |
| 161   | .002511  | -.013278 | -.111561 | .000020  | .000010  | -.000001 |
| 162   | .003672  | -.013477 | -.111818 | -.000017 | .000011  | -.000002 |
| 163   | .005085  | -.009174 | -.112115 | -.000057 | .000014  | -.000002 |
| 164   | -.000127 | -.000019 | -.114196 | .000096  | .000017  | -.000000 |
| 165   | .001474  | -.009385 | -.114690 | .000064  | .000011  | -.000001 |
| 166   | .002657  | -.014695 | -.115105 | .000026  | .000010  | -.000001 |
| 167   | .003770  | -.015308 | -.115431 | -.000017 | .000010  | -.000002 |
| 168   | .005100  | -.010570 | -.115671 | -.000065 | .000013  | -.000002 |
| 169   | -.000113 | -.000037 | -.115516 | .000095  | .000015  | .000000  |
| 170   | .001452  | -.009434 | -.115715 | .000064  | .000012  | -.000001 |
| 171   | .002657  | -.014791 | -.115993 | .000027  | .000010  | -.000001 |
| 172   | .003772  | -.015450 | -.116359 | -.000016 | .000010  | -.000002 |
| 173   | .005099  | -.010763 | -.116812 | -.000065 | .000013  | -.000002 |
| 174   | -.000070 | -.000057 | -.118198 | .000098  | .000015  | .000000  |
| 175   | .001426  | -.009887 | -.118624 | .000069  | .000012  | -.000001 |
| 176   | .002724  | -.015755 | -.119035 | .000030  | .000011  | -.000001 |
| 177   | .003996  | -.016676 | -.119422 | -.000016 | .000011  | -.000001 |
| 178   | .005328  | -.011703 | -.119783 | -.000070 | .000012  | -.000001 |
| 179   | -.000024 | -.000055 | -.119196 | .000100  | .000012  | .000000  |
| 180   | .001398  | -.009963 | -.119553 | .000069  | .000012  | -.000001 |
| 181   | .002722  | -.015829 | -.119925 | .000030  | .000011  | -.000001 |
| 182   | .003999  | -.016747 | -.120322 | -.000016 | .000011  | -.000001 |
| 183   | .005334  | -.011774 | -.120744 | -.000070 | .000012  | -.000001 |
| 184   | .000034  | -.000053 | -.120916 | .000101  | .000011  | .000000  |
| 185   | .001279  | -.010053 | -.121263 | .000069  | .000011  | .000001  |
| 186   | .002659  | -.015959 | -.121632 | .000030  | .000012  | .000001  |
| 187   | .004101  | -.016865 | -.122033 | -.000016 | .000012  | .000001  |
| 188   | .005479  | -.011842 | -.122466 | -.000071 | .000011  | .000001  |
| 189   | .000081  | -.000052 | -.121659 | .000099  | .000008  | .000000  |
| 190   | .001248  | -.010004 | -.122106 | .000069  | .000011  | .000001  |
| 191   | .002657  | -.015909 | -.122531 | .000030  | .000012  | .000001  |
| 192   | .004104  | -.016814 | -.122924 | -.000016 | .000012  | .000001  |
| 193   | .005483  | -.011788 | -.123285 | -.000071 | .000011  | .000001  |
| 194   | .000119  | -.000028 | -.122460 | .000099  | .000007  | .000000  |
| 195   | .001245  | -.009729 | -.122665 | .000066  | .000011  | .000000  |
| 196   | .002747  | -.015200 | -.122953 | .000027  | .000013  | .000001  |
| 197   | .004339  | -.015818 | -.123332 | -.000017 | .000013  | .000002  |
| 198   | .005712  | -.010978 | -.123800 | -.000067 | .000010  | .000002  |
| 199   | .000126  | -.000009 | -.122916 | .000100  | .000006  | .000000  |
| 200   | .001228  | -.009703 | -.123427 | .000065  | .000012  | .000000  |
| 201   | .002746  | -.015125 | -.123856 | .000027  | .000014  | .000001  |
| 202   | .004341  | -.015694 | -.124193 | -.000017 | .000013  | .000002  |
| 203   | .005710  | -.010802 | -.124442 | -.000067 | .000010  | .000002  |
| 204   | .000095  | .000017  | -.123434 | .000097  | .000008  | .000000  |
| 205   | .001341  | -.009175 | -.123610 | .000060  | .000012  | .000000  |
| 206   | .002902  | -.013907 | -.123824 | .000021  | .000014  | .000001  |
| 207   | .004457  | -.014059 | -.124087 | -.000019 | .000012  | .000001  |
| 208   | .005745  | -.009521 | -.124400 | -.000059 | .000009  | .000002  |
| 209   | .000000  | .000000  | -.124604 | .000098  | .000010  | -.000000 |
| 210   | .001349  | -.009143 | -.124896 | .000059  | .000012  | .000000  |
| 211   | .002910  | -.013785 | -.125108 | .000020  | .000013  | .000001  |
| 212   | .004454  | -.013845 | -.125215 | -.000019 | .000012  | .000002  |
| 213   | .005729  | -.009226 | -.125219 | -.000059 | .000009  | .000002  |
| 214   | -.000084 | -.000045 | -.116781 | .000098  | .000018  | -.000000 |
| 215   | .000092  | -.000038 | -.121972 | .000101  | .000005  | .000000  |
| 216   | .000000  | .000000  | -.108745 | -.000092 | .000013  | -.000000 |
| 217   | .001339  | .008635  | -.108986 | -.000056 | .000011  | .000001  |
| 218   | .002498  | .013064  | -.109165 | -.000020 | .000010  | .000001  |
| 219   | .003676  | .013147  | -.109263 | .000018  | .000011  | .000002  |
| 220   | .005108  | .008754  | -.109283 | .000057  | .000014  | .000002  |
| 221   | -.000104 | -.000012 | -.111162 | -.000092 | .000015  | .000000  |
| 222   | .001354  | .008732  | -.111346 | -.000057 | .000011  | .000001  |
| 223   | .002511  | .013278  | -.111561 | -.000020 | .000010  | .000001  |
| 224   | .003672  | .013477  | -.111818 | .000017  | .000011  | .000002  |
| 225   | .005085  | .009174  | -.112115 | .000057  | .000014  | .000002  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 3 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|----------|----------|----------|----------|---------|----------|
| 226   | -.000127 | .000019  | -.114196 | -.000096 | .000017 | .000000  |
| 227   | .001474  | .009385  | -.114690 | -.000064 | .000011 | .000001  |
| 228   | .002657  | .014695  | -.115105 | -.000026 | .000010 | .000001  |
| 229   | .003770  | .015308  | -.115431 | .000017  | .000010 | .000002  |
| 230   | .005100  | .010570  | -.115671 | .000065  | .000013 | .000002  |
| 231   | -.000113 | .000037  | -.115516 | -.000095 | .000015 | .000000  |
| 232   | .001452  | .009434  | -.115715 | -.000064 | .000012 | .000001  |
| 233   | .002657  | .014791  | -.115993 | -.000027 | .000010 | .000001  |
| 234   | .003772  | .015450  | -.116359 | .000016  | .000010 | .000002  |
| 235   | .005099  | .010763  | -.116812 | .000065  | .000013 | .000002  |
| 236   | -.000070 | .000057  | -.118198 | -.000098 | .000015 | .000000  |
| 237   | .001426  | .009887  | -.118624 | -.000069 | .000012 | .000001  |
| 238   | .002724  | .015755  | -.119035 | -.000030 | .000011 | .000001  |
| 239   | .003996  | .016676  | -.119422 | .000016  | .000011 | .000001  |
| 240   | .005328  | .011703  | -.119783 | .000070  | .000012 | .000001  |
| 241   | -.000024 | .000055  | -.119196 | -.000100 | .000012 | .000000  |
| 242   | .001398  | .009963  | -.119553 | -.000069 | .000012 | .000001  |
| 243   | .002722  | .015829  | -.119925 | -.000030 | .000011 | .000001  |
| 244   | .003999  | .016747  | -.120322 | .000016  | .000011 | .000001  |
| 245   | .005334  | .011774  | -.120744 | .000070  | .000012 | .000001  |
| 246   | .000034  | .000053  | -.120916 | -.000101 | .000011 | .000000  |
| 247   | .001279  | .010053  | -.121263 | -.000069 | .000011 | -.000001 |
| 248   | .002659  | .015959  | -.121632 | -.000030 | .000012 | -.000001 |
| 249   | .004101  | .016865  | -.122033 | .000016  | .000012 | -.000001 |
| 250   | .005479  | .011842  | -.122466 | .000071  | .000011 | -.000001 |
| 251   | .000081  | .000052  | -.121659 | -.000099 | .000008 | .000000  |
| 252   | .001248  | .010004  | -.122106 | -.000069 | .000011 | -.000001 |
| 253   | .002657  | .015909  | -.122531 | -.000030 | .000012 | -.000001 |
| 254   | .004104  | .016814  | -.122924 | .000016  | .000012 | -.000001 |
| 255   | .005483  | .011788  | -.123285 | .000071  | .000011 | -.000001 |
| 256   | .000119  | .000028  | -.122460 | -.000099 | .000007 | .000000  |
| 257   | .001245  | .009729  | -.122665 | -.000066 | .000011 | -.000000 |
| 258   | .002747  | .015200  | -.122953 | -.000027 | .000013 | -.000001 |
| 259   | .004339  | .015818  | -.123332 | .000017  | .000013 | -.000002 |
| 260   | .005712  | .010978  | -.123800 | .000067  | .000010 | -.000002 |
| 261   | .000126  | .000009  | -.122916 | -.000100 | .000006 | -.000000 |
| 262   | .001228  | .009703  | -.123427 | -.000065 | .000012 | -.000000 |
| 263   | .002746  | .015125  | -.123856 | -.000027 | .000014 | -.000001 |
| 264   | .004341  | .015694  | -.124193 | .000017  | .000013 | -.000002 |
| 265   | .005710  | .010802  | -.124442 | .000067  | .000010 | -.000002 |
| 266   | .000095  | -.000017 | -.123434 | -.000097 | .000008 | -.000000 |
| 267   | .001341  | .009175  | -.123610 | -.000060 | .000012 | -.000000 |
| 268   | .002902  | .013907  | -.123824 | -.000021 | .000014 | -.000001 |
| 269   | .004457  | .014059  | -.124087 | .000019  | .000012 | -.000001 |
| 270   | .005745  | .009521  | -.124400 | .000059  | .000009 | -.000002 |
| 271   | .000000  | .000000  | -.124604 | -.000098 | .000010 | .000000  |
| 272   | .001349  | .009143  | -.124896 | -.000059 | .000012 | -.000000 |
| 273   | .002910  | .013785  | -.125108 | -.000020 | .000013 | -.000001 |
| 274   | .004454  | .013845  | -.125215 | .000019  | .000012 | -.000002 |
| 275   | .005729  | .009226  | -.125219 | .000059  | .000009 | -.000002 |
| 276   | -.000084 | .000045  | -.116781 | -.000098 | .000018 | .000000  |
| 277   | .000092  | .000038  | -.121972 | -.000101 | .000005 | -.000000 |
| 278   | -.000041 | .000006  | -.099088 | .000087  | .000014 | .000000  |
| 279   | -.000046 | .000008  | -.090828 | .000066  | .000014 | .000000  |
| 280   | -.000037 | .000006  | -.085336 | .000036  | .000014 | .000000  |
| 281   | -.000032 | .000000  | -.083417 | .000000  | .000014 | .000000  |
| 282   | -.000037 | -.000006 | -.085336 | -.000036 | .000014 | .000000  |
| 283   | -.000046 | -.000008 | -.090828 | -.000066 | .000014 | .000000  |
| 284   | -.000041 | -.000006 | -.099088 | -.000087 | .000014 | -.000000 |
| 285   | -.000067 | .000012  | -.101387 | .000087  | .000016 | -.000000 |
| 286   | -.000044 | .000008  | -.093098 | .000067  | .000015 | -.000000 |
| 287   | -.000032 | .000003  | -.087570 | .000036  | .000015 | .000000  |
| 288   | -.000028 | .000000  | -.085636 | .000000  | .000014 | .000000  |
| 289   | -.000032 | -.000003 | -.087570 | -.000036 | .000015 | .000000  |
| 290   | -.000044 | -.000008 | -.093098 | -.000067 | .000015 | .000000  |
| 291   | -.000067 | -.000012 | -.101387 | -.000087 | .000016 | .000000  |
| 292   | -.000073 | -.000012 | -.103976 | .000090  | .000017 | -.000000 |
| 293   | -.000039 | -.000008 | -.095429 | .000068  | .000015 | -.000000 |
| 294   | -.000024 | -.000004 | -.089782 | .000037  | .000014 | .000000  |
| 295   | -.000020 | .000000  | -.087813 | .000000  | .000014 | .000000  |
| 296   | -.000024 | .000004  | -.089782 | -.000037 | .000014 | .000000  |
| 297   | -.000039 | .000008  | -.095429 | -.000068 | .000015 | .000000  |
| 298   | -.000073 | .000012  | -.103976 | -.000090 | .000017 | .000000  |
| 299   | -.000051 | -.000034 | -.106401 | .000092  | .000016 | -.000000 |
| 300   | -.000027 | -.000023 | -.097684 | .000070  | .000014 | -.000000 |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 3 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|----------|----------|----------|----------|---------|----------|
| 301   | -.000015 | -.000012 | -.091898 | .000038  | .000013 | .000000  |
| 302   | -.000012 | .000000  | -.089878 | .000000  | .000013 | .000000  |
| 303   | -.000015 | .000012  | -.091898 | -.000038 | .000013 | .000000  |
| 304   | -.000027 | .000023  | -.097684 | -.000070 | .000014 | .000000  |
| 305   | -.000051 | .000034  | -.106401 | -.000092 | .000016 | .000000  |
| 306   | -.000016 | -.000044 | -.108584 | .000094  | .000012 | .000000  |
| 307   | -.000008 | -.000031 | -.099664 | .000072  | .000012 | .000000  |
| 308   | -.000004 | -.000016 | -.093759 | .000038  | .000011 | .000000  |
| 309   | -.000003 | .000000  | -.091700 | .000000  | .000011 | .000000  |
| 310   | -.000004 | .000016  | -.093759 | -.000038 | .000011 | .000000  |
| 311   | -.000008 | .000031  | -.099664 | -.000072 | .000012 | .000000  |
| 312   | -.000016 | .000044  | -.108584 | -.000094 | .000012 | .000000  |
| 313   | .000022  | -.000043 | -.110237 | .000095  | .000009 | .000000  |
| 314   | .000013  | -.000030 | -.101237 | .000072  | .000009 | .000000  |
| 315   | .000008  | -.000015 | -.095276 | .000039  | .000009 | .000000  |
| 316   | .000006  | .000000  | -.093197 | .000000  | .000009 | .000000  |
| 317   | .000008  | .000015  | -.095276 | -.000039 | .000009 | .000000  |
| 318   | .000013  | .000030  | -.101237 | -.000072 | .000009 | .000000  |
| 319   | .000022  | .000043  | -.110237 | -.000095 | .000009 | .000000  |
| 320   | .000056  | -.000032 | -.111386 | .000094  | .000006 | .000000  |
| 321   | .000031  | -.000022 | -.102421 | .000072  | .000007 | .000000  |
| 322   | .000019  | -.000011 | -.096471 | .000039  | .000007 | .000000  |
| 323   | .000015  | .000000  | -.094394 | .000000  | .000007 | .000000  |
| 324   | .000019  | .000011  | -.096471 | -.000039 | .000007 | .000000  |
| 325   | .000031  | .000022  | -.102421 | -.000072 | .000007 | -.000000 |
| 326   | .000056  | .000032  | -.111386 | -.000094 | .000006 | -.000000 |
| 327   | .000074  | -.000009 | -.112320 | .000094  | .000006 | .000000  |
| 328   | .000042  | -.000006 | -.103388 | .000072  | .000006 | .000000  |
| 329   | .000027  | -.000003 | -.097480 | .000038  | .000006 | .000000  |
| 330   | .000023  | .000000  | -.095420 | .000000  | .000006 | .000000  |
| 331   | .000027  | .000003  | -.097480 | -.000038 | .000006 | .000000  |
| 332   | .000042  | .000006  | -.103388 | -.000072 | .000006 | -.000000 |
| 333   | .000074  | .000009  | -.112320 | -.000094 | .000006 | -.000000 |
| 334   | .000066  | .000013  | -.113141 | .000092  | .000007 | .000000  |
| 335   | .000046  | .000008  | -.104357 | .000071  | .000007 | .000000  |
| 336   | .000034  | .000004  | -.098484 | .000038  | .000007 | .000000  |
| 337   | .000030  | .000000  | -.096428 | .000000  | .000007 | .000000  |
| 338   | .000034  | -.000004 | -.098484 | -.000038 | .000007 | .000000  |
| 339   | .000046  | -.000008 | -.104357 | -.000071 | .000007 | -.000000 |
| 340   | .000066  | -.000013 | -.113141 | -.000092 | .000007 | -.000000 |
| 341   | .000044  | .000006  | -.114289 | .000093  | .000008 | -.000000 |
| 342   | .000048  | .000009  | -.105432 | .000071  | .000007 | .000000  |
| 343   | .000038  | .000006  | -.099533 | .000038  | .000007 | .000000  |
| 344   | .000034  | .000000  | -.097470 | .000000  | .000007 | .000000  |
| 345   | .000038  | -.000006 | -.099533 | -.000038 | .000007 | .000000  |
| 346   | .000048  | -.000009 | -.105432 | -.000071 | .000007 | .000000  |
| 347   | .000044  | -.000006 | -.114289 | -.000093 | .000008 | .000000  |

***HIPÓTESIS CON MÓDULO DE BALASTO PARA EL TERRENO IGUAL A 5 kg/cm<sup>3</sup>***

## Listado Input

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# S Y S T E M   D A T A

EXECUTION CODE - - - - - 0

NUMBER OF LOAD CONDITIONS - - - - - 3

STEADY STATE LOAD FREQUENCY - - - - - .0000E+00

NUMBER OF EIGENVALUES - - - - - 7

EIGEN CONVERGENCE TOLERANCE - - - - - .1000E-03

EIGEN CUTOFF TIME PERIOD - - - - - .0000E+00

## G E N E R A T E D   J O I N T   C O O R D I N A T E S

| JOINT | X       | Y       | Z       |
|-------|---------|---------|---------|
| 1     | .000    | .000    | 585.000 |
| 2     | .000    | 106.250 | 585.000 |
| 3     | .000    | 212.500 | 585.000 |
| 4     | .000    | 318.750 | 585.000 |
| 5     | .000    | 425.000 | 585.000 |
| 6     | .000    | 531.250 | 585.000 |
| 7     | .000    | 637.500 | 585.000 |
| 8     | .000    | 743.750 | 585.000 |
| 9     | .000    | 850.000 | 585.000 |
| 10    | 161.800 | .000    | 585.000 |
| 11    | 161.800 | 106.250 | 585.000 |
| 12    | 161.800 | 212.500 | 585.000 |
| 13    | 161.800 | 318.750 | 585.000 |
| 14    | 161.800 | 425.000 | 585.000 |
| 15    | 161.800 | 531.250 | 585.000 |
| 16    | 161.800 | 637.500 | 585.000 |
| 17    | 161.800 | 743.750 | 585.000 |
| 18    | 161.800 | 850.000 | 585.000 |
| 19    | 239.400 | .000    | 585.000 |
| 20    | 239.400 | 106.250 | 585.000 |
| 21    | 239.400 | 212.500 | 585.000 |
| 22    | 239.400 | 318.750 | 585.000 |
| 23    | 239.400 | 425.000 | 585.000 |
| 24    | 239.400 | 531.250 | 585.000 |
| 25    | 239.400 | 637.500 | 585.000 |
| 26    | 239.400 | 743.750 | 585.000 |
| 27    | 239.400 | 850.000 | 585.000 |
| 28    | 317.000 | .000    | 585.000 |
| 29    | 317.000 | 106.250 | 585.000 |
| 30    | 317.000 | 212.500 | 585.000 |
| 31    | 317.000 | 318.750 | 585.000 |
| 32    | 317.000 | 425.000 | 585.000 |
| 33    | 317.000 | 531.250 | 585.000 |
| 34    | 317.000 | 637.500 | 585.000 |
| 35    | 317.000 | 743.750 | 585.000 |
| 36    | 317.000 | 850.000 | 585.000 |
| 37    | 394.600 | .000    | 585.000 |
| 38    | 394.600 | 106.250 | 585.000 |
| 39    | 394.600 | 212.500 | 585.000 |
| 40    | 394.600 | 318.750 | 585.000 |
| 41    | 394.600 | 425.000 | 585.000 |
| 42    | 394.600 | 531.250 | 585.000 |
| 43    | 394.600 | 637.500 | 585.000 |
| 44    | 394.600 | 743.750 | 585.000 |
| 45    | 394.600 | 850.000 | 585.000 |
| 46    | 472.200 | .000    | 585.000 |
| 47    | 472.200 | 106.250 | 585.000 |
| 48    | 472.200 | 212.500 | 585.000 |
| 49    | 472.200 | 318.750 | 585.000 |
| 50    | 472.200 | 425.000 | 585.000 |
| 51    | 472.200 | 531.250 | 585.000 |
| 52    | 472.200 | 637.500 | 585.000 |
| 53    | 472.200 | 743.750 | 585.000 |
| 54    | 472.200 | 850.000 | 585.000 |
| 55    | 549.800 | .000    | 585.000 |
| 56    | 549.800 | 106.250 | 585.000 |
| 57    | 549.800 | 212.500 | 585.000 |
| 58    | 549.800 | 318.750 | 585.000 |
| 59    | 549.800 | 425.000 | 585.000 |
| 60    | 549.800 | 531.250 | 585.000 |
| 61    | 549.800 | 637.500 | 585.000 |
| 62    | 549.800 | 743.750 | 585.000 |

|     |          |         |         |
|-----|----------|---------|---------|
| 63  | 549.800  | 850.000 | 585.000 |
| 64  | 627.400  | .000    | 585.000 |
| 65  | 627.400  | 106.250 | 585.000 |
| 66  | 627.400  | 212.500 | 585.000 |
| 67  | 627.400  | 318.750 | 585.000 |
| 68  | 627.400  | 425.000 | 585.000 |
| 69  | 627.400  | 531.250 | 585.000 |
| 70  | 627.400  | 637.500 | 585.000 |
| 71  | 627.400  | 743.750 | 585.000 |
| 72  | 627.400  | 850.000 | 585.000 |
| 73  | 705.000  | .000    | 585.000 |
| 74  | 705.000  | 106.250 | 585.000 |
| 75  | 705.000  | 212.500 | 585.000 |
| 76  | 705.000  | 318.750 | 585.000 |
| 77  | 705.000  | 425.000 | 585.000 |
| 78  | 705.000  | 531.250 | 585.000 |
| 79  | 705.000  | 637.500 | 585.000 |
| 80  | 705.000  | 743.750 | 585.000 |
| 81  | 705.000  | 850.000 | 585.000 |
| 82  | 782.600  | .000    | 585.000 |
| 83  | 782.600  | 106.250 | 585.000 |
| 84  | 782.600  | 212.500 | 585.000 |
| 85  | 782.600  | 318.750 | 585.000 |
| 86  | 782.600  | 425.000 | 585.000 |
| 87  | 782.600  | 531.250 | 585.000 |
| 88  | 782.600  | 637.500 | 585.000 |
| 89  | 782.600  | 743.750 | 585.000 |
| 90  | 782.600  | 850.000 | 585.000 |
| 91  | 860.200  | .000    | 585.000 |
| 92  | 860.200  | 106.250 | 585.000 |
| 93  | 860.200  | 212.500 | 585.000 |
| 94  | 860.200  | 318.750 | 585.000 |
| 95  | 860.200  | 425.000 | 585.000 |
| 96  | 860.200  | 531.250 | 585.000 |
| 97  | 860.200  | 637.500 | 585.000 |
| 98  | 860.200  | 743.750 | 585.000 |
| 99  | 860.200  | 850.000 | 585.000 |
| 100 | 937.800  | .000    | 585.000 |
| 101 | 937.800  | 106.250 | 585.000 |
| 102 | 937.800  | 212.500 | 585.000 |
| 103 | 937.800  | 318.750 | 585.000 |
| 104 | 937.800  | 425.000 | 585.000 |
| 105 | 937.800  | 531.250 | 585.000 |
| 106 | 937.800  | 637.500 | 585.000 |
| 107 | 937.800  | 743.750 | 585.000 |
| 108 | 937.800  | 850.000 | 585.000 |
| 109 | 1015.400 | .000    | 585.000 |
| 110 | 1015.400 | 106.250 | 585.000 |
| 111 | 1015.400 | 212.500 | 585.000 |
| 112 | 1015.400 | 318.750 | 585.000 |
| 113 | 1015.400 | 425.000 | 585.000 |
| 114 | 1015.400 | 531.250 | 585.000 |
| 115 | 1015.400 | 637.500 | 585.000 |
| 116 | 1015.400 | 743.750 | 585.000 |
| 117 | 1015.400 | 850.000 | 585.000 |
| 118 | 1093.000 | .000    | 585.000 |
| 119 | 1093.000 | 106.250 | 585.000 |
| 120 | 1093.000 | 212.500 | 585.000 |
| 121 | 1093.000 | 318.750 | 585.000 |
| 122 | 1093.000 | 425.000 | 585.000 |
| 123 | 1093.000 | 531.250 | 585.000 |
| 124 | 1093.000 | 637.500 | 585.000 |
| 125 | 1093.000 | 743.750 | 585.000 |
| 126 | 1093.000 | 850.000 | 585.000 |
| 127 | 1170.600 | .000    | 585.000 |
| 128 | 1170.600 | 106.250 | 585.000 |
| 129 | 1170.600 | 212.500 | 585.000 |
| 130 | 1170.600 | 318.750 | 585.000 |
| 131 | 1170.600 | 425.000 | 585.000 |
| 132 | 1170.600 | 531.250 | 585.000 |
| 133 | 1170.600 | 637.500 | 585.000 |
| 134 | 1170.600 | 743.750 | 585.000 |
| 135 | 1170.600 | 850.000 | 585.000 |
| 136 | 1248.200 | .000    | 585.000 |
| 137 | 1248.200 | 106.250 | 585.000 |
| 138 | 1248.200 | 212.500 | 585.000 |
| 139 | 1248.200 | 318.750 | 585.000 |
| 140 | 1248.200 | 425.000 | 585.000 |
| 141 | 1248.200 | 531.250 | 585.000 |
| 142 | 1248.200 | 637.500 | 585.000 |

|     |          |         |         |
|-----|----------|---------|---------|
| 143 | 1248.200 | 743.750 | 585.000 |
| 144 | 1248.200 | 850.000 | 585.000 |
| 145 | 1390.000 | .000    | 585.000 |
| 146 | 1390.000 | 106.250 | 585.000 |
| 147 | 1390.000 | 212.500 | 585.000 |
| 148 | 1390.000 | 318.750 | 585.000 |
| 149 | 1390.000 | 425.000 | 585.000 |
| 150 | 1390.000 | 531.250 | 585.000 |
| 151 | 1390.000 | 637.500 | 585.000 |
| 152 | 1390.000 | 743.750 | 585.000 |
| 153 | 1390.000 | 850.000 | 585.000 |
| 154 | .000     | .000    | .000    |
| 155 | .000     | .000    | 117.000 |
| 156 | .000     | .000    | 234.000 |
| 157 | .000     | .000    | 351.000 |
| 158 | .000     | .000    | 468.000 |
| 159 | 161.800  | .000    | .000    |
| 160 | 161.800  | .000    | 117.000 |
| 161 | 161.800  | .000    | 234.000 |
| 162 | 161.800  | .000    | 351.000 |
| 163 | 161.800  | .000    | 468.000 |
| 164 | 317.000  | .000    | .000    |
| 165 | 317.000  | .000    | 117.000 |
| 166 | 317.000  | .000    | 234.000 |
| 167 | 317.000  | .000    | 351.000 |
| 168 | 317.000  | .000    | 468.000 |
| 169 | 394.600  | .000    | .000    |
| 170 | 394.600  | .000    | 117.000 |
| 171 | 394.600  | .000    | 234.000 |
| 172 | 394.600  | .000    | 351.000 |
| 173 | 394.600  | .000    | 468.000 |
| 174 | 549.800  | .000    | .000    |
| 175 | 549.800  | .000    | 117.000 |
| 176 | 549.800  | .000    | 234.000 |
| 177 | 549.800  | .000    | 351.000 |
| 178 | 549.800  | .000    | 468.000 |
| 179 | 627.400  | .000    | .000    |
| 180 | 627.400  | .000    | 117.000 |
| 181 | 627.400  | .000    | 234.000 |
| 182 | 627.400  | .000    | 351.000 |
| 183 | 627.400  | .000    | 468.000 |
| 184 | 782.600  | .000    | .000    |
| 185 | 782.600  | .000    | 117.000 |
| 186 | 782.600  | .000    | 234.000 |
| 187 | 782.600  | .000    | 351.000 |
| 188 | 782.600  | .000    | 468.000 |
| 189 | 860.200  | .000    | .000    |
| 190 | 860.200  | .000    | 117.000 |
| 191 | 860.200  | .000    | 234.000 |
| 192 | 860.200  | .000    | 351.000 |
| 193 | 860.200  | .000    | 468.000 |
| 194 | 1015.400 | .000    | .000    |
| 195 | 1015.400 | .000    | 117.000 |
| 196 | 1015.400 | .000    | 234.000 |
| 197 | 1015.400 | .000    | 351.000 |
| 198 | 1015.400 | .000    | 468.000 |
| 199 | 1093.000 | .000    | .000    |
| 200 | 1093.000 | .000    | 117.000 |
| 201 | 1093.000 | .000    | 234.000 |
| 202 | 1093.000 | .000    | 351.000 |
| 203 | 1093.000 | .000    | 468.000 |
| 204 | 1248.200 | .000    | .000    |
| 205 | 1248.200 | .000    | 117.000 |
| 206 | 1248.200 | .000    | 234.000 |
| 207 | 1248.200 | .000    | 351.000 |
| 208 | 1248.200 | .000    | 468.000 |
| 209 | 1390.000 | .000    | .000    |
| 210 | 1390.000 | .000    | 117.000 |
| 211 | 1390.000 | .000    | 234.000 |
| 212 | 1390.000 | .000    | 351.000 |
| 213 | 1390.000 | .000    | 468.000 |
| 214 | 472.200  | .000    | .000    |
| 215 | 937.800  | .000    | .000    |
| 216 | .000     | 850.000 | .000    |
| 217 | .000     | 850.000 | 117.000 |
| 218 | .000     | 850.000 | 234.000 |
| 219 | .000     | 850.000 | 351.000 |
| 220 | .000     | 850.000 | 468.000 |
| 221 | 161.800  | 850.000 | .000    |
| 222 | 161.800  | 850.000 | 117.000 |

|     |          |         |         |
|-----|----------|---------|---------|
| 223 | 161.800  | 850.000 | 234.000 |
| 224 | 161.800  | 850.000 | 351.000 |
| 225 | 161.800  | 850.000 | 468.000 |
| 226 | 317.000  | 850.000 | .000    |
| 227 | 317.000  | 850.000 | 117.000 |
| 228 | 317.000  | 850.000 | 234.000 |
| 229 | 317.000  | 850.000 | 351.000 |
| 230 | 317.000  | 850.000 | 468.000 |
| 231 | 394.600  | 850.000 | .000    |
| 232 | 394.600  | 850.000 | 117.000 |
| 233 | 394.600  | 850.000 | 234.000 |
| 234 | 394.600  | 850.000 | 351.000 |
| 235 | 394.600  | 850.000 | 468.000 |
| 236 | 549.800  | 850.000 | .000    |
| 237 | 549.800  | 850.000 | 117.000 |
| 238 | 549.800  | 850.000 | 234.000 |
| 239 | 549.800  | 850.000 | 351.000 |
| 240 | 549.800  | 850.000 | 468.000 |
| 241 | 627.400  | 850.000 | .000    |
| 242 | 627.400  | 850.000 | 117.000 |
| 243 | 627.400  | 850.000 | 234.000 |
| 244 | 627.400  | 850.000 | 351.000 |
| 245 | 627.400  | 850.000 | 468.000 |
| 246 | 782.600  | 850.000 | .000    |
| 247 | 782.600  | 850.000 | 117.000 |
| 248 | 782.600  | 850.000 | 234.000 |
| 249 | 782.600  | 850.000 | 351.000 |
| 250 | 782.600  | 850.000 | 468.000 |
| 251 | 860.200  | 850.000 | .000    |
| 252 | 860.200  | 850.000 | 117.000 |
| 253 | 860.200  | 850.000 | 234.000 |
| 254 | 860.200  | 850.000 | 351.000 |
| 255 | 860.200  | 850.000 | 468.000 |
| 256 | 1015.400 | 850.000 | .000    |
| 257 | 1015.400 | 850.000 | 117.000 |
| 258 | 1015.400 | 850.000 | 234.000 |
| 259 | 1015.400 | 850.000 | 351.000 |
| 260 | 1015.400 | 850.000 | 468.000 |
| 261 | 1093.000 | 850.000 | .000    |
| 262 | 1093.000 | 850.000 | 117.000 |
| 263 | 1093.000 | 850.000 | 234.000 |
| 264 | 1093.000 | 850.000 | 351.000 |
| 265 | 1093.000 | 850.000 | 468.000 |
| 266 | 1248.200 | 850.000 | .000    |
| 267 | 1248.200 | 850.000 | 117.000 |
| 268 | 1248.200 | 850.000 | 234.000 |
| 269 | 1248.200 | 850.000 | 351.000 |
| 270 | 1248.200 | 850.000 | 468.000 |
| 271 | 1390.000 | 850.000 | .000    |
| 272 | 1390.000 | 850.000 | 117.000 |
| 273 | 1390.000 | 850.000 | 234.000 |
| 274 | 1390.000 | 850.000 | 351.000 |
| 275 | 1390.000 | 850.000 | 468.000 |
| 276 | 472.200  | 850.000 | .000    |
| 277 | 937.800  | 850.000 | .000    |
| 278 | .000     | 106.250 | .000    |
| 279 | .000     | 212.500 | .000    |
| 280 | .000     | 318.750 | .000    |
| 281 | .000     | 425.000 | .000    |
| 282 | .000     | 531.250 | .000    |
| 283 | .000     | 637.500 | .000    |
| 284 | .000     | 743.750 | .000    |
| 285 | 154.444  | 106.250 | .000    |
| 286 | 154.444  | 212.500 | .000    |
| 287 | 154.444  | 318.750 | .000    |
| 288 | 154.444  | 425.000 | .000    |
| 289 | 154.444  | 531.250 | .000    |
| 290 | 154.444  | 637.500 | .000    |
| 291 | 154.444  | 743.750 | .000    |
| 292 | 308.889  | 106.250 | .000    |
| 293 | 308.889  | 212.500 | .000    |
| 294 | 308.889  | 318.750 | .000    |
| 295 | 308.889  | 425.000 | .000    |
| 296 | 308.889  | 531.250 | .000    |
| 297 | 308.889  | 637.500 | .000    |
| 298 | 308.889  | 743.750 | .000    |
| 299 | 463.333  | 106.250 | .000    |
| 300 | 463.333  | 212.500 | .000    |
| 301 | 463.333  | 318.750 | .000    |
| 302 | 463.333  | 425.000 | .000    |

|     |          |         |      |
|-----|----------|---------|------|
| 303 | 463.333  | 531.250 | .000 |
| 304 | 463.333  | 637.500 | .000 |
| 305 | 463.333  | 743.750 | .000 |
| 306 | 617.778  | 106.250 | .000 |
| 307 | 617.778  | 212.500 | .000 |
| 308 | 617.778  | 318.750 | .000 |
| 309 | 617.778  | 425.000 | .000 |
| 310 | 617.778  | 531.250 | .000 |
| 311 | 617.778  | 637.500 | .000 |
| 312 | 617.778  | 743.750 | .000 |
| 313 | 772.222  | 106.250 | .000 |
| 314 | 772.222  | 212.500 | .000 |
| 315 | 772.222  | 318.750 | .000 |
| 316 | 772.222  | 425.000 | .000 |
| 317 | 772.222  | 531.250 | .000 |
| 318 | 772.222  | 637.500 | .000 |
| 319 | 772.222  | 743.750 | .000 |
| 320 | 926.667  | 106.250 | .000 |
| 321 | 926.667  | 212.500 | .000 |
| 322 | 926.667  | 318.750 | .000 |
| 323 | 926.667  | 425.000 | .000 |
| 324 | 926.667  | 531.250 | .000 |
| 325 | 926.667  | 637.500 | .000 |
| 326 | 926.667  | 743.750 | .000 |
| 327 | 1081.111 | 106.250 | .000 |
| 328 | 1081.111 | 212.500 | .000 |
| 329 | 1081.111 | 318.750 | .000 |
| 330 | 1081.111 | 425.000 | .000 |
| 331 | 1081.111 | 531.250 | .000 |
| 332 | 1081.111 | 637.500 | .000 |
| 333 | 1081.111 | 743.750 | .000 |
| 334 | 1235.556 | 106.250 | .000 |
| 335 | 1235.556 | 212.500 | .000 |
| 336 | 1235.556 | 318.750 | .000 |
| 337 | 1235.556 | 425.000 | .000 |
| 338 | 1235.556 | 531.250 | .000 |
| 339 | 1235.556 | 637.500 | .000 |
| 340 | 1235.556 | 743.750 | .000 |
| 341 | 1390.000 | 106.250 | .000 |
| 342 | 1390.000 | 212.500 | .000 |
| 343 | 1390.000 | 318.750 | .000 |
| 344 | 1390.000 | 425.000 | .000 |
| 345 | 1390.000 | 531.250 | .000 |
| 346 | 1390.000 | 637.500 | .000 |
| 347 | 1390.000 | 743.750 | .000 |

# R E S T R A I N T   D A T A

| JOINT | RX | RY | RZ | RXX | RYY | RZZ |
|-------|----|----|----|-----|-----|-----|
| 154   | 1  | 1  | 0  | 0   | 0   | 0   |
| 209   | 1  | 1  | 0  | 0   | 0   | 0   |
| 216   | 1  | 1  | 0  | 0   | 0   | 0   |
| 271   | 1  | 1  | 0  | 0   | 0   | 0   |

# S P R I N G   D A T A

| JOINT | KX       | KY       | KZ       | KRX      | KRY      | KRZ      |
|-------|----------|----------|----------|----------|----------|----------|
| 154   | .000E+00 | .000E+00 | .215E+02 | .000E+00 | .000E+00 | .000E+00 |
| 216   | .000E+00 | .000E+00 | .215E+02 | .000E+00 | .000E+00 | .000E+00 |
| 278   | .000E+00 | .000E+00 | .430E+02 | .000E+00 | .000E+00 | .000E+00 |
| 279   | .000E+00 | .000E+00 | .430E+02 | .000E+00 | .000E+00 | .000E+00 |
| 280   | .000E+00 | .000E+00 | .430E+02 | .000E+00 | .000E+00 | .000E+00 |
| 281   | .000E+00 | .000E+00 | .430E+02 | .000E+00 | .000E+00 | .000E+00 |
| 282   | .000E+00 | .000E+00 | .430E+02 | .000E+00 | .000E+00 | .000E+00 |
| 283   | .000E+00 | .000E+00 | .430E+02 | .000E+00 | .000E+00 | .000E+00 |
| 284   | .000E+00 | .000E+00 | .430E+02 | .000E+00 | .000E+00 | .000E+00 |
| 209   | .000E+00 | .000E+00 | .190E+02 | .000E+00 | .000E+00 | .000E+00 |
| 271   | .000E+00 | .000E+00 | .190E+02 | .000E+00 | .000E+00 | .000E+00 |
| 341   | .000E+00 | .000E+00 | .375E+02 | .000E+00 | .000E+00 | .000E+00 |
| 342   | .000E+00 | .000E+00 | .375E+02 | .000E+00 | .000E+00 | .000E+00 |
| 343   | .000E+00 | .000E+00 | .375E+02 | .000E+00 | .000E+00 | .000E+00 |
| 344   | .000E+00 | .000E+00 | .375E+02 | .000E+00 | .000E+00 | .000E+00 |
| 345   | .000E+00 | .000E+00 | .375E+02 | .000E+00 | .000E+00 | .000E+00 |
| 346   | .000E+00 | .000E+00 | .375E+02 | .000E+00 | .000E+00 | .000E+00 |
| 347   | .000E+00 | .000E+00 | .375E+02 | .000E+00 | .000E+00 | .000E+00 |
| 159   | .000E+00 | .000E+00 | .420E+02 | .000E+00 | .000E+00 | .000E+00 |
| 221   | .000E+00 | .000E+00 | .420E+02 | .000E+00 | .000E+00 | .000E+00 |
| 285   | .000E+00 | .000E+00 | .840E+02 | .000E+00 | .000E+00 | .000E+00 |
| 286   | .000E+00 | .000E+00 | .840E+02 | .000E+00 | .000E+00 | .000E+00 |
| 287   | .000E+00 | .000E+00 | .840E+02 | .000E+00 | .000E+00 | .000E+00 |



[illegible]

|     |          |          |          |          |          |          |
|-----|----------|----------|----------|----------|----------|----------|
| 46  | .000E+00 | .000E+00 | .155E-02 | .000E+00 | .000E+00 | .000E+00 |
| 54  | .000E+00 | .000E+00 | .155E-02 | .000E+00 | .000E+00 | .000E+00 |
| 100 | .000E+00 | .000E+00 | .155E-02 | .000E+00 | .000E+00 | .000E+00 |
| 108 | .000E+00 | .000E+00 | .155E-02 | .000E+00 | .000E+00 | .000E+00 |
| 38  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 39  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 40  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 41  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 42  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 43  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 44  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 56  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 57  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 58  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 59  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 60  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 61  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 62  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 92  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 93  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 94  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 95  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 96  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 97  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 98  | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 110 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 111 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 112 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 113 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 114 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 115 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 116 | .000E+00 | .000E+00 | .289E-02 | .000E+00 | .000E+00 | .000E+00 |
| 47  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 48  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 49  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 50  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 51  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 52  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 53  | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 101 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 102 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 103 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 104 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 105 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 106 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 107 | .000E+00 | .000E+00 | .310E-02 | .000E+00 | .000E+00 | .000E+00 |
| 136 | .000E+00 | .000E+00 | .141E-02 | .000E+00 | .000E+00 | .000E+00 |
| 144 | .000E+00 | .000E+00 | .141E-02 | .000E+00 | .000E+00 | .000E+00 |
| 137 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 138 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 139 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 140 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 141 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 142 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 143 | .000E+00 | .000E+00 | .282E-02 | .000E+00 | .000E+00 | .000E+00 |
| 145 | .000E+00 | .000E+00 | .912E-03 | .000E+00 | .000E+00 | .000E+00 |
| 153 | .000E+00 | .000E+00 | .912E-03 | .000E+00 | .000E+00 | .000E+00 |
| 146 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |
| 147 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |
| 148 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |
| 149 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |
| 150 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |
| 151 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |
| 152 | .000E+00 | .000E+00 | .182E-02 | .000E+00 | .000E+00 | .000E+00 |

# FRAME CONTROL DATA

|                                     |    |
|-------------------------------------|----|
| NUMBER OF MEMBER SECTION PROPERTIES | 20 |
| NUMBER OF SPAN LOADING PATTERNS     | 0  |

| LOAD | GRAVITATIONAL MULTIPLIERS |      |      | TEMPERATURE | PRESTRESS   |
|------|---------------------------|------|------|-------------|-------------|
| COND | X                         | Y    | Z    | MULTIPLIERS | MULTIPLIERS |
| 1    | .000                      | .000 | .000 | .000        | .000        |
| 2    | .000                      | .000 | .000 | .000        | .000        |
| 3    | .000                      | .000 | .000 | .000        | .000        |

# SECTION PROPERTY DATA

| PROP | AREA | TORSIONAL | MOMENTS OF INERTIA |     | SHEAR AREAS |    |
|------|------|-----------|--------------------|-----|-------------|----|
| ID   |      | INERTIA   | I33                | I22 | A2          | A3 |

|    |          |            |            |            |          |          |
|----|----------|------------|------------|------------|----------|----------|
| 1  | .742E+04 | .16800E+08 | .15070E+08 | .56000E+07 | .000E+00 | .000E+00 |
| 2  | .110E+05 | .16620E+08 | .17210E+08 | .83100E+07 | .000E+00 | .000E+00 |
| 3  | .712E+04 | .10760E+08 | .33400E+07 | .53800E+07 | .000E+00 | .000E+00 |
| 4  | .101E+05 | .15180E+08 | .12000E+08 | .75900E+07 | .000E+00 | .000E+00 |
| 5  | .652E+04 | .14760E+08 | .10260E+08 | .49200E+07 | .000E+00 | .000E+00 |
| 6  | .774E+04 | .21000E+08 | .47600E+07 | .70000E+07 | .000E+00 | .000E+00 |
| 7  | .975E+04 | .14720E+08 | .85800E+07 | .73600E+07 | .000E+00 | .000E+00 |
| 8  | .405E+04 | .25290E+07 | .88240E+07 | .84300E+06 | .000E+00 | .000E+00 |
| 9  | .793E+04 | .33000E+07 | .16610E+08 | .16500E+07 | .000E+00 | .000E+00 |
| 10 | .582E+04 | .24300E+07 | .87600E+07 | .12125E+07 | .000E+00 | .000E+00 |
| 11 | .743E+04 | .31000E+07 | .13980E+08 | .15500E+07 | .000E+00 | .000E+00 |
| 12 | .355E+04 | .22200E+07 | .59400E+07 | .73850E+06 | .000E+00 | .000E+00 |
| 13 | .758E+04 | .20530E+08 | .43400E+07 | .68400E+07 | .000E+00 | .000E+00 |
| 14 | .585E+04 | .13340E+08 | .12200E+07 | .66700E+07 | .000E+00 | .000E+00 |
| 15 | .722E+04 | .16200E+08 | .13900E+08 | .54000E+07 | .000E+00 | .000E+00 |
| 16 | .143E+05 | .21430E+08 | .26780E+08 | .10720E+08 | .000E+00 | .000E+00 |
| 17 | .139E+05 | .20920E+08 | .24840E+08 | .10460E+08 | .000E+00 | .000E+00 |
| 18 | .133E+05 | .20000E+08 | .21840E+08 | .10000E+08 | .000E+00 | .000E+00 |
| 19 | .637E+04 | .14360E+08 | .95200E+07 | .47900E+07 | .000E+00 | .000E+00 |
| 20 | .950E+04 | .14290E+08 | .79170E+07 | .71400E+07 | .000E+00 | .000E+00 |

# M A T E R I A L   P R O P E R T Y   D A T A

| PROP ID | MODULUS OF ELASTICITY | SHEAR MODULUS | WEIGHT PER UNIT LEN | MASS PER UNIT LEN | THERMAL EXPANSION |
|---------|-----------------------|---------------|---------------------|-------------------|-------------------|
| 1       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 2       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 3       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 4       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 5       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 6       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 7       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 8       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 9       | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 10      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 11      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 12      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 13      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 14      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 15      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 16      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 17      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 18      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 19      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |
| 20      | .3169E+03             | .1321E+03     | .0000E+00           | .0000E+00         | .0000E+00         |

# F R A M E   E L E M E N T   D A T A

| ELT ID | JOINT END-I | JOINT END-J | LOCAL-AXIS N1 N2 |   | PROPERTY-ID END-I END-J VAR |   |   | REL CODES | REF TEMP | ELEMENT LENGTH |
|--------|-------------|-------------|------------------|---|-----------------------------|---|---|-----------|----------|----------------|
| 1      | 1           | 2           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 2      | 2           | 3           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 3      | 3           | 4           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 4      | 4           | 5           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 5      | 5           | 6           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 6      | 6           | 7           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 7      | 7           | 8           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 8      | 8           | 9           | 1                | 0 | 1                           | 1 | 0 | 000000    | .00      | 106.25         |
| 9      | 10          | 11          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 10     | 11          | 12          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 11     | 12          | 13          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 12     | 13          | 14          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 13     | 14          | 15          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 14     | 15          | 16          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 15     | 16          | 17          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 16     | 17          | 18          | 1                | 0 | 2                           | 2 | 0 | 000000    | .00      | 106.25         |
| 17     | 19          | 20          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 18     | 20          | 21          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 19     | 21          | 22          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 20     | 22          | 23          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 21     | 23          | 24          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 22     | 24          | 25          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 23     | 25          | 26          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 24     | 26          | 27          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 25     | 28          | 29          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 26     | 29          | 30          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 27     | 30          | 31          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 28     | 31          | 32          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |
| 29     | 32          | 33          | 1                | 0 | 3                           | 3 | 0 | 000000    | .00      | 106.25         |

|     |     |     |   |   |   |   |   |        |     |        |
|-----|-----|-----|---|---|---|---|---|--------|-----|--------|
| 30  | 33  | 34  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 31  | 34  | 35  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 32  | 35  | 36  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 33  | 37  | 38  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 34  | 38  | 39  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 35  | 39  | 40  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 36  | 40  | 41  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 37  | 41  | 42  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 38  | 42  | 43  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 39  | 43  | 44  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 40  | 44  | 45  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 41  | 46  | 47  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 42  | 47  | 48  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 43  | 48  | 49  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 44  | 49  | 50  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 45  | 50  | 51  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 46  | 51  | 52  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 47  | 52  | 53  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 48  | 53  | 54  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 49  | 55  | 56  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 50  | 56  | 57  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 51  | 57  | 58  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 52  | 58  | 59  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 53  | 59  | 60  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 54  | 60  | 61  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 55  | 61  | 62  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 56  | 62  | 63  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 57  | 64  | 65  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 58  | 65  | 66  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 59  | 66  | 67  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 60  | 67  | 68  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 61  | 68  | 69  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 62  | 69  | 70  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 63  | 70  | 71  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 64  | 71  | 72  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 65  | 73  | 74  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 66  | 74  | 75  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 67  | 75  | 76  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 68  | 76  | 77  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 69  | 77  | 78  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 70  | 78  | 79  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 71  | 79  | 80  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 72  | 80  | 81  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 73  | 82  | 83  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 74  | 83  | 84  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 75  | 84  | 85  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 76  | 85  | 86  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 77  | 86  | 87  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 78  | 87  | 88  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 79  | 88  | 89  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 80  | 89  | 90  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 81  | 91  | 92  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 82  | 92  | 93  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 83  | 93  | 94  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 84  | 94  | 95  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 85  | 95  | 96  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 86  | 96  | 97  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 87  | 97  | 98  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 88  | 98  | 99  | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 89  | 100 | 101 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 90  | 101 | 102 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 91  | 102 | 103 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 92  | 103 | 104 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 93  | 104 | 105 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 94  | 105 | 106 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 95  | 106 | 107 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 96  | 107 | 108 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 97  | 109 | 110 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 98  | 110 | 111 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 99  | 111 | 112 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 100 | 112 | 113 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 101 | 113 | 114 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 102 | 114 | 115 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 103 | 115 | 116 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 104 | 116 | 117 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 105 | 118 | 119 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 106 | 119 | 120 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 107 | 120 | 121 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 108 | 121 | 122 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 109 | 122 | 123 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |

|     |     |     |   |   |   |   |   |        |     |        |
|-----|-----|-----|---|---|---|---|---|--------|-----|--------|
| 110 | 123 | 124 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 111 | 124 | 125 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 112 | 125 | 126 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 113 | 127 | 128 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 114 | 128 | 129 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 115 | 129 | 130 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 116 | 130 | 131 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 117 | 131 | 132 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 118 | 132 | 133 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 119 | 133 | 134 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 120 | 134 | 135 | 1 | 0 | 3 | 3 | 0 | 000000 | .00 | 106.25 |
| 121 | 136 | 137 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 122 | 137 | 138 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 123 | 138 | 139 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 124 | 139 | 140 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 125 | 140 | 141 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 126 | 141 | 142 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 127 | 142 | 143 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 128 | 143 | 144 | 1 | 0 | 4 | 4 | 0 | 000000 | .00 | 106.25 |
| 129 | 145 | 146 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 130 | 146 | 147 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 131 | 147 | 148 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 132 | 148 | 149 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 133 | 149 | 150 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 134 | 150 | 151 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 135 | 151 | 152 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 136 | 152 | 153 | 1 | 0 | 5 | 5 | 0 | 000000 | .00 | 106.25 |
| 137 | 1   | 10  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 161.80 |
| 138 | 10  | 19  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 139 | 19  | 28  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 140 | 28  | 37  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 141 | 37  | 46  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 142 | 46  | 55  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 143 | 55  | 64  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 144 | 64  | 73  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 145 | 73  | 82  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 146 | 82  | 91  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 147 | 91  | 100 | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 148 | 100 | 109 | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 149 | 109 | 118 | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 150 | 118 | 127 | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 151 | 127 | 136 | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 152 | 136 | 145 | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 141.80 |
| 153 | 2   | 11  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 154 | 11  | 20  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 155 | 20  | 29  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 156 | 29  | 38  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 157 | 38  | 47  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 158 | 47  | 56  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 159 | 56  | 65  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 160 | 65  | 74  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 161 | 74  | 83  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 162 | 83  | 92  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 163 | 92  | 101 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 164 | 101 | 110 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 165 | 110 | 119 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 166 | 119 | 128 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 167 | 128 | 137 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 168 | 137 | 146 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 169 | 3   | 12  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 170 | 12  | 21  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 171 | 21  | 30  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 172 | 30  | 39  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 173 | 39  | 48  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 174 | 48  | 57  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 175 | 57  | 66  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 176 | 66  | 75  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 177 | 75  | 84  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 178 | 84  | 93  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 179 | 93  | 102 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 180 | 102 | 111 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 181 | 111 | 120 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 182 | 120 | 129 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 183 | 129 | 138 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 184 | 138 | 147 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 185 | 4   | 13  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 186 | 13  | 22  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 187 | 22  | 31  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 188 | 31  | 40  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 189 | 40  | 49  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |

|     |     |     |   |   |   |   |   |        |     |        |
|-----|-----|-----|---|---|---|---|---|--------|-----|--------|
| 190 | 49  | 58  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 191 | 58  | 67  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 192 | 67  | 76  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 193 | 76  | 85  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 194 | 85  | 94  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 195 | 94  | 103 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 196 | 103 | 112 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 197 | 112 | 121 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 198 | 121 | 130 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 199 | 130 | 139 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 200 | 139 | 148 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 201 | 5   | 14  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 202 | 14  | 23  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 203 | 23  | 32  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 204 | 32  | 41  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 205 | 41  | 50  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 206 | 50  | 59  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 207 | 59  | 68  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 208 | 68  | 77  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 209 | 77  | 86  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 210 | 86  | 95  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 211 | 95  | 104 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 212 | 104 | 113 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 213 | 113 | 122 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 214 | 122 | 131 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 215 | 131 | 140 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 216 | 140 | 149 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 217 | 6   | 15  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 218 | 15  | 24  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 219 | 24  | 33  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 220 | 33  | 42  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 221 | 42  | 51  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 222 | 51  | 60  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 223 | 60  | 69  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 224 | 69  | 78  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 225 | 78  | 87  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 226 | 87  | 96  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 227 | 96  | 105 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 228 | 105 | 114 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 229 | 114 | 123 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 230 | 123 | 132 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 231 | 132 | 141 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 232 | 141 | 150 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 233 | 7   | 16  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 234 | 16  | 25  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 235 | 25  | 34  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 236 | 34  | 43  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 237 | 43  | 52  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 238 | 52  | 61  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 239 | 61  | 70  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 240 | 70  | 79  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 241 | 79  | 88  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 242 | 88  | 97  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 243 | 97  | 106 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 244 | 106 | 115 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 245 | 115 | 124 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 246 | 124 | 133 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 247 | 133 | 142 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 248 | 142 | 151 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 249 | 8   | 17  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 161.80 |
| 250 | 17  | 26  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 251 | 26  | 35  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 252 | 35  | 44  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 253 | 44  | 53  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 254 | 53  | 62  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 255 | 62  | 71  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 256 | 71  | 80  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 257 | 80  | 89  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 258 | 89  | 98  | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 259 | 98  | 107 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 260 | 107 | 116 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 261 | 116 | 125 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 262 | 125 | 134 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 263 | 134 | 143 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 77.60  |
| 264 | 143 | 152 | 1 | 0 | 7 | 7 | 0 | 000000 | .00 | 141.80 |
| 265 | 9   | 18  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 161.80 |
| 266 | 18  | 27  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 267 | 27  | 36  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 268 | 36  | 45  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |
| 269 | 45  | 54  | 1 | 0 | 6 | 6 | 0 | 000000 | .00 | 77.60  |

|     |     |     |    |   |    |    |   |        |     |        |
|-----|-----|-----|----|---|----|----|---|--------|-----|--------|
| 270 | 54  | 63  | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 271 | 63  | 72  | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 272 | 72  | 81  | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 273 | 81  | 90  | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 274 | 90  | 99  | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 275 | 99  | 108 | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 276 | 108 | 117 | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 277 | 117 | 126 | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 278 | 126 | 135 | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 279 | 135 | 144 | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 77.60  |
| 280 | 144 | 153 | 1  | 0 | 6  | 6  | 0 | 000000 | .00 | 141.80 |
| 281 | 154 | 155 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 282 | 155 | 156 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 283 | 156 | 157 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 284 | 157 | 158 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 285 | 158 | 1   | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 286 | 159 | 160 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 287 | 160 | 161 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 288 | 161 | 162 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 289 | 162 | 163 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 290 | 163 | 10  | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 291 | 164 | 165 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 292 | 165 | 166 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 293 | 166 | 167 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 294 | 167 | 168 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 295 | 168 | 28  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 296 | 169 | 170 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 297 | 170 | 171 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 298 | 171 | 172 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 299 | 172 | 173 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 300 | 173 | 37  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 301 | 174 | 175 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 302 | 175 | 176 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 303 | 176 | 177 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 304 | 177 | 178 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 305 | 178 | 55  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 306 | 179 | 180 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 307 | 180 | 181 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 308 | 181 | 182 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 309 | 182 | 183 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 310 | 183 | 64  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 311 | 184 | 185 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 312 | 185 | 186 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 313 | 186 | 187 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 314 | 187 | 188 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 315 | 188 | 82  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 316 | 189 | 190 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 317 | 190 | 191 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 318 | 191 | 192 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 319 | 192 | 193 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 320 | 193 | 91  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 321 | 194 | 195 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 322 | 195 | 196 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 323 | 196 | 197 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 324 | 197 | 198 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 325 | 198 | 109 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 326 | 199 | 200 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 327 | 200 | 201 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 328 | 201 | 202 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 329 | 202 | 203 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 330 | 203 | 118 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 331 | 204 | 205 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 332 | 205 | 206 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 333 | 206 | 207 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 334 | 207 | 208 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 335 | 208 | 136 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 336 | 209 | 210 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 337 | 210 | 211 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 338 | 211 | 212 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 339 | 212 | 213 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 340 | 213 | 145 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 341 | 154 | 159 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 161.80 |
| 342 | 159 | 164 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 155.20 |
| 343 | 164 | 169 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 344 | 169 | 214 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 345 | 214 | 174 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 346 | 174 | 179 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 347 | 179 | 184 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 155.20 |
| 348 | 184 | 189 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 349 | 189 | 215 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |

|     |     |     |    |   |    |    |   |        |     |        |
|-----|-----|-----|----|---|----|----|---|--------|-----|--------|
| 350 | 215 | 194 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 351 | 194 | 199 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 352 | 199 | 204 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 155.20 |
| 353 | 204 | 209 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 141.80 |
| 354 | 155 | 160 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 355 | 165 | 170 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 356 | 175 | 180 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 357 | 185 | 190 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 358 | 195 | 200 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 359 | 205 | 210 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 360 | 156 | 161 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 361 | 166 | 171 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 362 | 176 | 181 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 363 | 186 | 191 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 364 | 196 | 201 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 365 | 206 | 211 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 366 | 157 | 162 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 367 | 167 | 172 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 368 | 177 | 182 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 369 | 187 | 192 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 370 | 197 | 202 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 371 | 207 | 212 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 372 | 158 | 163 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 373 | 168 | 173 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 374 | 178 | 183 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 375 | 188 | 193 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 376 | 198 | 203 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 377 | 208 | 213 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 378 | 216 | 217 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 379 | 217 | 218 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 380 | 218 | 219 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 381 | 219 | 220 | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 382 | 220 | 9   | -2 | 0 | 8  | 8  | 0 | 000000 | .00 | 117.00 |
| 383 | 221 | 222 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 384 | 222 | 223 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 385 | 223 | 224 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 386 | 224 | 225 | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 387 | 225 | 18  | -2 | 0 | 9  | 9  | 0 | 000000 | .00 | 117.00 |
| 388 | 226 | 227 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 389 | 227 | 228 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 390 | 228 | 229 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 391 | 229 | 230 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 392 | 230 | 36  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 393 | 231 | 232 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 394 | 232 | 233 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 395 | 233 | 234 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 396 | 234 | 235 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 397 | 235 | 45  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 398 | 236 | 237 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 399 | 237 | 238 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 400 | 238 | 239 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 401 | 239 | 240 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 402 | 240 | 63  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 403 | 241 | 242 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 404 | 242 | 243 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 405 | 243 | 244 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 406 | 244 | 245 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 407 | 245 | 72  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 408 | 246 | 247 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 409 | 247 | 248 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 410 | 248 | 249 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 411 | 249 | 250 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 412 | 250 | 90  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 413 | 251 | 252 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 414 | 252 | 253 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 415 | 253 | 254 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 416 | 254 | 255 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 417 | 255 | 99  | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 418 | 256 | 257 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 419 | 257 | 258 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 420 | 258 | 259 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 421 | 259 | 260 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 422 | 260 | 117 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 423 | 261 | 262 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 424 | 262 | 263 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 425 | 263 | 264 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 426 | 264 | 265 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 427 | 265 | 126 | -2 | 0 | 10 | 10 | 0 | 000000 | .00 | 117.00 |
| 428 | 266 | 267 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 429 | 267 | 268 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |

|     |     |     |    |   |    |    |   |        |     |        |
|-----|-----|-----|----|---|----|----|---|--------|-----|--------|
| 430 | 268 | 269 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 431 | 269 | 270 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 432 | 270 | 144 | -2 | 0 | 11 | 11 | 0 | 000000 | .00 | 117.00 |
| 433 | 271 | 272 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 434 | 272 | 273 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 435 | 273 | 274 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 436 | 274 | 275 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 437 | 275 | 153 | -2 | 0 | 12 | 12 | 0 | 000000 | .00 | 117.00 |
| 438 | 216 | 221 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 161.80 |
| 439 | 221 | 226 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 155.20 |
| 440 | 226 | 231 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 441 | 231 | 276 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 442 | 276 | 236 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 443 | 236 | 241 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 444 | 241 | 246 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 155.20 |
| 445 | 246 | 251 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 446 | 251 | 277 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 447 | 277 | 256 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 448 | 256 | 261 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 77.60  |
| 449 | 261 | 266 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 155.20 |
| 450 | 266 | 271 | -2 | 0 | 13 | 13 | 0 | 000000 | .00 | 141.80 |
| 451 | 217 | 222 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 452 | 227 | 232 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 453 | 237 | 242 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 454 | 247 | 252 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 455 | 257 | 262 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 456 | 267 | 272 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 457 | 218 | 223 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 458 | 228 | 233 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 459 | 238 | 243 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 460 | 248 | 253 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 461 | 258 | 263 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 462 | 268 | 273 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 463 | 219 | 224 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 464 | 229 | 234 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 465 | 239 | 244 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 466 | 249 | 254 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 467 | 259 | 264 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 468 | 269 | 274 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 469 | 220 | 225 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 161.80 |
| 470 | 230 | 235 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 471 | 240 | 245 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 472 | 250 | 255 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 473 | 260 | 265 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 77.60  |
| 474 | 270 | 275 | -2 | 0 | 14 | 14 | 0 | 000000 | .00 | 141.80 |
| 475 | 154 | 278 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 476 | 278 | 279 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 477 | 279 | 280 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 478 | 280 | 281 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 479 | 281 | 282 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 480 | 282 | 283 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 481 | 283 | 284 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 482 | 284 | 216 | 1  | 0 | 15 | 15 | 0 | 000000 | .00 | 106.25 |
| 483 | 159 | 285 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.50 |
| 484 | 285 | 286 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.25 |
| 485 | 286 | 287 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.25 |
| 486 | 287 | 288 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.25 |
| 487 | 288 | 289 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.25 |
| 488 | 289 | 290 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.25 |
| 489 | 290 | 291 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.25 |
| 490 | 291 | 221 | 1  | 0 | 16 | 16 | 0 | 000000 | .00 | 106.50 |
| 491 | 164 | 292 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.56 |
| 499 | 214 | 299 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.62 |
| 507 | 179 | 306 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.68 |
| 515 | 184 | 313 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.76 |
| 523 | 215 | 320 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.83 |
| 531 | 199 | 327 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.91 |
| 498 | 298 | 226 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.56 |
| 506 | 305 | 276 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.62 |
| 514 | 312 | 241 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.68 |
| 522 | 319 | 246 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.76 |
| 530 | 326 | 277 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.83 |
| 538 | 333 | 261 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.91 |
| 492 | 292 | 293 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 500 | 299 | 300 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 508 | 306 | 307 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 516 | 313 | 314 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 524 | 320 | 321 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 532 | 327 | 328 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 493 | 293 | 294 | 1  | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |

|     |     |     |   |   |    |    |   |        |     |        |
|-----|-----|-----|---|---|----|----|---|--------|-----|--------|
| 501 | 300 | 301 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 509 | 307 | 308 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 517 | 314 | 315 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 525 | 321 | 322 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 533 | 328 | 329 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 494 | 294 | 295 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 502 | 301 | 302 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 510 | 308 | 309 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 518 | 315 | 316 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 526 | 322 | 323 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 534 | 329 | 330 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 495 | 295 | 296 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 503 | 302 | 303 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 511 | 309 | 310 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 519 | 316 | 317 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 527 | 323 | 324 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 535 | 330 | 331 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 496 | 296 | 297 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 504 | 303 | 304 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 512 | 310 | 311 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 520 | 317 | 318 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 528 | 324 | 325 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 536 | 331 | 332 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 497 | 297 | 298 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 505 | 304 | 305 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 513 | 311 | 312 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 521 | 318 | 319 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 529 | 325 | 326 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 537 | 332 | 333 | 1 | 0 | 17 | 17 | 0 | 000000 | .00 | 106.25 |
| 539 | 204 | 334 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 107.00 |
| 540 | 334 | 335 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 106.25 |
| 541 | 335 | 336 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 106.25 |
| 542 | 336 | 337 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 106.25 |
| 543 | 337 | 338 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 106.25 |
| 544 | 338 | 339 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 106.25 |
| 545 | 339 | 340 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 106.25 |
| 546 | 340 | 266 | 1 | 0 | 18 | 18 | 0 | 000000 | .00 | 107.00 |
| 547 | 209 | 341 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 548 | 341 | 342 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 549 | 342 | 343 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 550 | 343 | 344 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 551 | 344 | 345 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 552 | 345 | 346 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 553 | 346 | 347 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 554 | 347 | 271 | 1 | 0 | 19 | 19 | 0 | 000000 | .00 | 106.25 |
| 555 | 278 | 285 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 556 | 285 | 292 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 557 | 292 | 299 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 558 | 299 | 306 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 559 | 306 | 313 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 560 | 313 | 320 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 561 | 320 | 327 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 562 | 327 | 334 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 563 | 334 | 341 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 564 | 279 | 286 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 565 | 286 | 293 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 566 | 293 | 300 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 567 | 300 | 307 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 568 | 307 | 314 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 569 | 314 | 321 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 570 | 321 | 328 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 571 | 328 | 335 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 572 | 335 | 342 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 573 | 280 | 287 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 574 | 287 | 294 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 575 | 294 | 301 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 576 | 301 | 308 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 577 | 308 | 315 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 578 | 315 | 322 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 579 | 322 | 329 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 580 | 329 | 336 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 581 | 336 | 343 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 582 | 281 | 288 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 583 | 288 | 295 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 584 | 295 | 302 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 585 | 302 | 309 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 586 | 309 | 316 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 587 | 316 | 323 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 588 | 323 | 330 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 589 | 330 | 337 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |

|     |     |     |   |   |    |    |   |        |     |        |
|-----|-----|-----|---|---|----|----|---|--------|-----|--------|
| 590 | 337 | 344 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 591 | 282 | 289 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 592 | 289 | 296 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 593 | 296 | 303 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 594 | 303 | 310 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 595 | 310 | 317 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 596 | 317 | 324 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 597 | 324 | 331 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 598 | 331 | 338 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 599 | 338 | 345 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 600 | 283 | 290 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 601 | 290 | 297 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 602 | 297 | 304 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 603 | 304 | 311 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 604 | 311 | 318 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 605 | 318 | 325 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 606 | 325 | 332 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 607 | 332 | 339 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 608 | 339 | 346 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 609 | 284 | 291 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 610 | 291 | 298 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 611 | 298 | 305 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 612 | 305 | 312 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 613 | 312 | 319 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 614 | 319 | 326 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 615 | 326 | 333 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 616 | 333 | 340 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |
| 617 | 340 | 347 | 1 | 0 | 20 | 20 | 0 | 000000 | .00 | 154.44 |

T O T A L   W E I G H T S   A N D   M A S S E S

| PROP  | WEIGHT | MASS  |
|-------|--------|-------|
| 1     | .0000  | .0000 |
| 2     | .0000  | .0000 |
| 3     | .0000  | .0000 |
| 4     | .0000  | .0000 |
| 5     | .0000  | .0000 |
| 6     | .0000  | .0000 |
| 7     | .0000  | .0000 |
| 8     | .0000  | .0000 |
| 9     | .0000  | .0000 |
| 10    | .0000  | .0000 |
| 11    | .0000  | .0000 |
| 12    | .0000  | .0000 |
| 13    | .0000  | .0000 |
| 14    | .0000  | .0000 |
| 15    | .0000  | .0000 |
| 16    | .0000  | .0000 |
| 17    | .0000  | .0000 |
| 18    | .0000  | .0000 |
| 19    | .0000  | .0000 |
| 20    | .0000  | .0000 |
| TOTAL | .0000  | .0000 |

J O I N T   L O A D S

| JOINT | LOAD | FX       | FY       | FZ        | MX       | MY       | MZ       |
|-------|------|----------|----------|-----------|----------|----------|----------|
| 1     | 1    | .000E+00 | .000E+00 | -.102E+01 | .000E+00 | .000E+00 | .000E+00 |
| 9     | 1    | .000E+00 | .000E+00 | -.102E+01 | .000E+00 | .000E+00 | .000E+00 |
| 2     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 3     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 4     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 5     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 6     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 7     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 8     | 1    | .000E+00 | .000E+00 | -.204E+01 | .000E+00 | .000E+00 | .000E+00 |
| 10    | 1    | .000E+00 | .000E+00 | -.151E+01 | .000E+00 | .000E+00 | .000E+00 |
| 18    | 1    | .000E+00 | .000E+00 | -.151E+01 | .000E+00 | .000E+00 | .000E+00 |
| 11    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 12    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 13    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 14    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 15    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 16    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 17    | 1    | .000E+00 | .000E+00 | -.302E+01 | .000E+00 | .000E+00 | .000E+00 |
| 19    | 1    | .000E+00 | .000E+00 | -.131E+01 | .000E+00 | .000E+00 | .000E+00 |
| 28    | 1    | .000E+00 | .000E+00 | -.131E+01 | .000E+00 | .000E+00 | .000E+00 |
| 64    | 1    | .000E+00 | .000E+00 | -.131E+01 | .000E+00 | .000E+00 | .000E+00 |
| 73    | 1    | .000E+00 | .000E+00 | -.131E+01 | .000E+00 | .000E+00 | .000E+00 |

[illegible]

[illegible]

pi513.ERR

|                             |           |
|-----------------------------|-----------|
| EQUATION NUMBERING          | pi513.EQN |
| FREQUENCIES                 | pi513.EIG |
| DISPLACEMENTS AND REACTIONS | pi513.SOL |
| FRAME ELEMENT FORCES        | pi513.F3F |

## Listado Output

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E133 (513+360) TRAMO Va

E I G E N S Y S T E M P A R A M E T E R S

|                                  |   |      |
|----------------------------------|---|------|
| NUMBER OF EQUATIONS              | = | 2074 |
| NUMBER OF MASSES                 | = | 153  |
| NUMBER OF VALUES TO BE EVALUATED | = | 7    |
| SIZE OF SUBSPACE                 | = | 8    |

E133 (513+360) TRAMO Va

E I G E N V A L U E S     A N D     F R E Q U E N C I E S

| MODE<br>NUMBER | EIGENVALUE<br>(RAD/SEC)**2 | CIRCULAR FREQ<br>(RAD/SEC) | FREQUENCY<br>(CYCLES/SEC) | PERIOD<br>(SEC) |
|----------------|----------------------------|----------------------------|---------------------------|-----------------|
| 1              | .598904E+04                | .773889E+02                | 12.316829                 | .081190         |
| 2              | .887794E+04                | .942228E+02                | 14.996025                 | .066684         |
| 3              | .143919E+05                | .119966E+03                | 19.093215                 | .052375         |
| 4              | .561957E+05                | .237056E+03                | 37.728698                 | .026505         |
| 5              | .571841E+05                | .239132E+03                | 38.059050                 | .026275         |
| 6              | .117660E+06                | .343015E+03                | 54.592593                 | .018318         |
| 7              | .135984E+06                | .368760E+03                | 58.689994                 | .017039         |

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| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 1 -----   |      |               |           |             |       |           |         |         |
| 1         | 1    | .00           |           |             | .05   |           |         | 92.50   |
|           |      | .00           | -.23      | 11.36       |       | 7.36      | -170.78 |         |
|           |      | 106.25        | -.23      | -13.18      |       | 7.36      | 610.86  |         |
|           |      | 106.25        |           |             | .05   |           |         | 92.50   |
| 2         | 2    | .00           |           |             | .62   |           |         | 285.17  |
|           |      | .00           | -.83      | 40.10       |       | .78       | 185.33  |         |
|           |      | 106.25        | -.83      | -48.54      |       | .78       | 268.54  |         |
|           |      | 106.25        |           |             | .62   |           |         | 285.17  |
| 3         | 3    | .00           |           |             | .28   |           |         | 184.91  |
|           |      | .00           | -.46      | 21.78       |       | -.15      | 130.57  |         |
|           |      | 106.25        | -.46      | -27.05      |       | -.15      | 114.67  |         |
|           |      | 106.25        |           |             | .28   |           |         | 184.91  |
| 4 -----   |      |               |           |             |       |           |         |         |
| 1         | 1    | .00           |           |             | .38   |           |         | 18.79   |
|           |      | .00           | -.01      | -5.81       |       | 1.12      | 1726.18 |         |
|           |      | 106.25        | -.01      | -7.22       |       | 1.12      | 1844.90 |         |
|           |      | 106.25        |           |             | .38   |           |         | 18.79   |
| 2         | 2    | .00           |           |             | 1.75  |           |         | 63.08   |
|           |      | .00           | -.05      | -19.64      |       | .29       | 1061.28 |         |
|           |      | 106.25        | -.05      | -24.61      |       | .29       | 1091.97 |         |
|           |      | 106.25        |           |             | 1.75  |           |         | 63.08   |
| 3         | 3    | .00           |           |             | .85   |           |         | 42.64   |
|           |      | .00           | -.02      | -10.40      |       | .09       | 557.27  |         |
|           |      | 106.25        | -.02      | -12.63      |       | .09       | 566.45  |         |
|           |      | 106.25        |           |             | .85   |           |         | 42.64   |
| 5 -----   |      |               |           |             |       |           |         |         |
| 1         | 1    | .00           |           |             | .38   |           |         | -18.79  |
|           |      | .00           | .01       | -7.22       |       | -1.12     | 1844.90 |         |
|           |      | 106.25        | .01       | -5.81       |       | -1.12     | 1726.18 |         |
|           |      | 106.25        |           |             | .38   |           |         | -18.79  |
| 2         | 2    | .00           |           |             | 1.75  |           |         | -63.08  |
|           |      | .00           | .05       | -24.61      |       | -.29      | 1091.97 |         |
|           |      | 106.25        | .05       | -19.64      |       | -.29      | 1061.28 |         |
|           |      | 106.25        |           |             | 1.75  |           |         | -63.08  |
| 3         | 3    | .00           |           |             | .85   |           |         | -42.64  |
|           |      | .00           | .02       | -12.63      |       | -.09      | 566.45  |         |
|           |      | 106.25        | .02       | -10.40      |       | -.09      | 557.27  |         |
|           |      | 106.25        |           |             | .85   |           |         | -42.64  |
| 8 -----   |      |               |           |             |       |           |         |         |
| 1         | 1    | .00           |           |             | .05   |           |         | -92.50  |
|           |      | .00           | .23       | -13.18      |       | -7.36     | 610.86  |         |
|           |      | 106.25        | .23       | 11.36       |       | -7.36     | -170.78 |         |
|           |      | 106.25        |           |             | .05   |           |         | -92.50  |
| 2         | 2    | .00           |           |             | .62   |           |         | -285.17 |
|           |      | .00           | .83       | -48.54      |       | -.78      | 268.54  |         |
|           |      | 106.25        | .83       | 40.10       |       | -.78      | 185.33  |         |
|           |      | 106.25        |           |             | .62   |           |         | -285.17 |
| 3         | 3    | .00           |           |             | .28   |           |         | -184.91 |
|           |      | .00           | .46       | -27.05      |       | .15       | 114.67  |         |
|           |      | 106.25        | .46       | 21.78       |       | .15       | 130.57  |         |
|           |      | 106.25        |           |             | .28   |           |         | -184.91 |
| 9 -----   |      |               |           |             |       |           |         |         |
| 1         | 1    | .00           |           |             | -.19  |           |         | 99.82   |
|           |      | .00           | -.55      | 27.10       |       | 14.09     | -462.18 |         |
|           |      | 106.25        | -.55      | -30.85      |       | 14.09     | 1034.64 |         |
|           |      | 106.25        |           |             | -.19  |           |         | 99.82   |
| 2         | 2    | .00           |           |             | .02   |           |         | 354.73  |
|           |      | .00           | -1.68     | 83.28       |       | 8.98      | -252.46 |         |
|           |      | 106.25        | -1.68     | -95.68      |       | 8.98      | 701.21  |         |
|           |      | 106.25        |           |             | .02   |           |         | 354.73  |
| 3         | 3    | .00           |           |             | -.12  |           |         | 228.85  |
|           |      | .00           | -.85      | 43.18       |       | 4.63      | -141.98 |         |
|           |      | 106.25        | -.85      | -47.48      |       | 4.63      | 349.91  |         |
|           |      | 106.25        |           |             | -.12  |           |         | 228.85  |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 12 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .03   |           |         | 19.49   |
|           |      | .00           | -.03      | -4.96       |       | 1.90      | 2614.69 |         |
|           |      | 106.25        | -.03      | -7.94       |       | 1.90      | 2817.00 |         |
|           |      | 106.25        |           |             | .03   |           |         | 19.49   |
| 2         |      | .00           |           |             | .78   |           |         | 68.50   |
|           |      | .00           | -.10      | -16.82      |       | 1.28      | 1757.60 |         |
|           |      | 106.25        | -.10      | -27.58      |       | 1.28      | 1893.68 |         |
|           |      | 106.25        |           |             | .78   |           |         | 68.50   |
| 3         |      | .00           |           |             | .29   |           |         | 47.58   |
|           |      | .00           | -.05      | -8.91       |       | .69       | 953.56  |         |
|           |      | 106.25        | -.05      | -14.26      |       | .69       | 1027.25 |         |
|           |      | 106.25        |           |             | .29   |           |         | 47.58   |
| 13 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | .03   |           |         | -19.49  |
|           |      | .00           | .03       | -7.94       |       | -1.90     | 2817.00 |         |
|           |      | 106.25        | .03       | -4.96       |       | -1.90     | 2614.69 |         |
|           |      | 106.25        |           |             | .03   |           |         | -19.49  |
| 2         |      | .00           |           |             | .78   |           |         | -68.50  |
|           |      | .00           | .10       | -27.58      |       | -1.28     | 1893.68 |         |
|           |      | 106.25        | .10       | -16.82      |       | -1.28     | 1757.60 |         |
|           |      | 106.25        |           |             | .78   |           |         | -68.50  |
| 3         |      | .00           |           |             | .29   |           |         | -47.58  |
|           |      | .00           | .05       | -14.26      |       | -.69      | 1027.25 |         |
|           |      | 106.25        | .05       | -8.91       |       | -.69      | 953.56  |         |
|           |      | 106.25        |           |             | .29   |           |         | -47.58  |
| 16 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.19  |           |         | -99.82  |
|           |      | .00           | .55       | -30.85      |       | -14.09    | 1034.64 |         |
|           |      | 106.25        | .55       | 27.10       |       | -14.09    | -462.18 |         |
|           |      | 106.25        |           |             | -.19  |           |         | -99.82  |
| 2         |      | .00           |           |             | .02   |           |         | -354.73 |
|           |      | .00           | 1.68      | -95.68      |       | -8.98     | 701.21  |         |
|           |      | 106.25        | 1.68      | 83.28       |       | -8.98     | -252.46 |         |
|           |      | 106.25        |           |             | .02   |           |         | -354.73 |
| 3         |      | .00           |           |             | -.12  |           |         | -228.85 |
|           |      | .00           | .85       | -47.48      |       | -4.63     | 349.91  |         |
|           |      | 106.25        | .85       | 43.18       |       | -4.63     | -141.98 |         |
|           |      | 106.25        |           |             | -.12  |           |         | -228.85 |
| 17 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.12  |           |         | 52.89   |
|           |      | .00           | -.21      | 11.20       |       | 7.00      | -145.49 |         |
|           |      | 106.25        | -.21      | -11.37      |       | 7.00      | 597.81  |         |
|           |      | 106.25        |           |             | -.12  |           |         | 52.89   |
| 2         |      | .00           |           |             | -.06  |           |         | 183.64  |
|           |      | .00           | -.76      | 40.24       |       | 4.50      | -73.65  |         |
|           |      | 106.25        | -.76      | -40.97      |       | 4.50      | 404.44  |         |
|           |      | 106.25        |           |             | -.06  |           |         | 183.64  |
| 3         |      | .00           |           |             | -.09  |           |         | 131.36  |
|           |      | .00           | -.38      | 19.87       |       | 2.35      | -51.34  |         |
|           |      | 106.25        | -.38      | -20.23      |       | 2.35      | 197.98  |         |
|           |      | 106.25        |           |             | -.09  |           |         | 131.36  |
| 20 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.13  |           |         | 12.79   |
|           |      | .00           | -.02      | .30         |       | 1.25      | 1713.98 |         |
|           |      | 106.25        | -.02      | -1.97       |       | 1.25      | 1846.90 |         |
|           |      | 106.25        |           |             | -.13  |           |         | 12.79   |
| 2         |      | .00           |           |             | -.02  |           |         | 45.48   |
|           |      | .00           | -.08      | 1.14        |       | .90       | 1212.13 |         |
|           |      | 106.25        | -.08      | -6.89       |       | .90       | 1308.15 |         |
|           |      | 106.25        |           |             | -.02  |           |         | 45.48   |
| 3         |      | .00           |           |             | -.08  |           |         | 33.71   |
|           |      | .00           | -.04      | .60         |       | .53       | 668.22  |         |
|           |      | 106.25        | -.04      | -3.58       |       | .53       | 724.42  |         |
|           |      | 106.25        |           |             | -.08  |           |         | 33.71   |

| F R A M E |       | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|-------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD  | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND  | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 21        | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | -.13  |           |         | -12.79  |
|           |       | .00           | .02       | -1.97       |       | -1.25     | 1846.90 |         |
|           |       | 106.25        | .02       | .30         |       | -1.25     | 1713.98 |         |
|           |       | 106.25        |           |             | -.13  |           |         | -12.79  |
| 2         |       | .00           |           |             | -.02  |           |         | -45.48  |
|           |       | .00           | .08       | -6.89       |       | -.90      | 1308.15 |         |
|           |       | 106.25        | .08       | 1.14        |       | -.90      | 1212.13 |         |
|           |       | 106.25        |           |             | -.02  |           |         | -45.48  |
| 3         |       | .00           |           |             | -.08  |           |         | -33.71  |
|           |       | .00           | .04       | -3.58       |       | -.53      | 724.42  |         |
|           |       | 106.25        | .04       | .60         |       | -.53      | 668.22  |         |
|           |       | 106.25        |           |             | -.08  |           |         | -33.71  |
| 24        | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | -.12  |           |         | -52.89  |
|           |       | .00           | .21       | -11.37      |       | -7.00     | 597.81  |         |
|           |       | 106.25        | .21       | 11.20       |       | -7.00     | -145.49 |         |
|           |       | 106.25        |           |             | -.12  |           |         | -52.89  |
| 2         |       | .00           |           |             | -.06  |           |         | -183.64 |
|           |       | .00           | .76       | -40.97      |       | -4.50     | 404.44  |         |
|           |       | 106.25        | .76       | 40.24       |       | -4.50     | -73.65  |         |
|           |       | 106.25        |           |             | -.06  |           |         | -183.64 |
| 3         |       | .00           |           |             | -.09  |           |         | -131.36 |
|           |       | .00           | .38       | -20.23      |       | -2.35     | 197.98  |         |
|           |       | 106.25        | .38       | 19.87       |       | -2.35     | -51.34  |         |
|           |       | 106.25        |           |             | -.09  |           |         | -131.36 |
| 25        | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | -.17  |           |         | 75.97   |
|           |       | .00           | -.22      | 11.20       |       | 9.60      | -333.93 |         |
|           |       | 106.25        | -.22      | -11.90      |       | 9.60      | 686.56  |         |
|           |       | 106.25        |           |             | -.17  |           |         | 75.97   |
| 2         |       | .00           |           |             | -.13  |           |         | 263.50  |
|           |       | .00           | -.93      | 48.62       |       | 6.59      | -223.91 |         |
|           |       | 106.25        | -.93      | -50.03      |       | 6.59      | 476.01  |         |
|           |       | 106.25        |           |             | -.13  |           |         | 263.50  |
| 3         |       | .00           |           |             | -.14  |           |         | 166.86  |
|           |       | .00           | -.45      | 23.36       |       | 3.49      | -148.30 |         |
|           |       | 106.25        | -.45      | -24.19      |       | 3.49      | 222.87  |         |
|           |       | 106.25        |           |             | -.14  |           |         | 166.86  |
| 28        | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | -.23  |           |         | 12.19   |
|           |       | .00           | -.03      | .74         |       | 1.27      | 1734.52 |         |
|           |       | 106.25        | -.03      | -1.94       |       | 1.27      | 1869.77 |         |
|           |       | 106.25        |           |             | -.23  |           |         | 12.19   |
| 2         |       | .00           |           |             | -.34  |           |         | 43.47   |
|           |       | .00           | -.09      | 2.59        |       | .98       | 1285.65 |         |
|           |       | 106.25        | -.09      | -6.76       |       | .98       | 1389.56 |         |
|           |       | 106.25        |           |             | -.34  |           |         | 43.47   |
| 3         |       | .00           |           |             | -.25  |           |         | 39.97   |
|           |       | .00           | -.05      | 1.36        |       | 1.06      | 695.11  |         |
|           |       | 106.25        | -.05      | -3.51       |       | 1.06      | 808.13  |         |
|           |       | 106.25        |           |             | -.25  |           |         | 39.97   |
| 29        | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | -.23  |           |         | -12.19  |
|           |       | .00           | .03       | -1.94       |       | -1.27     | 1869.77 |         |
|           |       | 106.25        | .03       | .74         |       | -1.27     | 1734.52 |         |
|           |       | 106.25        |           |             | -.23  |           |         | -12.19  |
| 2         |       | .00           |           |             | -.34  |           |         | -43.47  |
|           |       | .00           | .09       | -6.76       |       | -.98      | 1389.56 |         |
|           |       | 106.25        | .09       | 2.59        |       | -.98      | 1285.65 |         |
|           |       | 106.25        |           |             | -.34  |           |         | -43.47  |
| 3         |       | .00           |           |             | -.25  |           |         | -39.97  |
|           |       | .00           | .05       | -3.51       |       | -1.06     | 808.13  |         |
|           |       | 106.25        | .05       | 1.36        |       | -1.06     | 695.11  |         |
|           |       | 106.25        |           |             | -.25  |           |         | -39.97  |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 32 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.17  |           |         | -75.97  |
|           |      | .00           | .22       | -11.90      |       | -9.60     | 686.56  |         |
|           |      | 106.25        | .22       | 11.20       |       | -9.60     | -333.93 |         |
|           |      | 106.25        |           |             | -.17  |           |         | -75.97  |
| 2         |      | .00           |           |             | -.13  |           |         | -263.50 |
|           |      | .00           | .93       | -50.03      |       | -6.59     | 476.01  |         |
|           |      | 106.25        | .93       | 48.62       |       | -6.59     | -223.91 |         |
|           |      | 106.25        |           |             | -.13  |           |         | -263.50 |
| 3         |      | .00           |           |             | -.14  |           |         | -166.86 |
|           |      | .00           | .45       | -24.19      |       | -3.49     | 222.87  |         |
|           |      | 106.25        | .45       | 23.36       |       | -3.49     | -148.30 |         |
|           |      | 106.25        |           |             | -.14  |           |         | -166.86 |
| 33 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.24  |           |         | 49.05   |
|           |      | .00           | -.27      | 14.22       |       | 10.28     | -373.62 |         |
|           |      | 106.25        | -.27      | -14.33      |       | 10.28     | 718.14  |         |
|           |      | 106.25        |           |             | -.24  |           |         | 49.05   |
| 2         |      | .00           |           |             | -.34  |           |         | 215.14  |
|           |      | .00           | -.86      | 45.29       |       | 9.65      | -400.86 |         |
|           |      | 106.25        | -.86      | -45.91      |       | 9.65      | 624.78  |         |
|           |      | 106.25        |           |             | -.34  |           |         | 215.14  |
| 3         |      | .00           |           |             | -.26  |           |         | 134.65  |
|           |      | .00           | -.42      | 22.60       |       | 4.75      | -237.22 |         |
|           |      | 106.25        | -.42      | -22.52      |       | 4.75      | 267.02  |         |
|           |      | 106.25        |           |             | -.26  |           |         | 134.65  |
| 36 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.29  |           |         | 10.65   |
|           |      | .00           | -.02      | .85         |       | 1.29      | 1753.35 |         |
|           |      | 106.25        | -.02      | -1.69       |       | 1.29      | 1890.70 |         |
|           |      | 106.25        |           |             | -.29  |           |         | 10.65   |
| 2         |      | .00           |           |             | -.56  |           |         | 37.40   |
|           |      | .00           | -.08      | 2.90        |       | 1.04      | 1352.53 |         |
|           |      | 106.25        | -.08      | -5.92       |       | 1.04      | 1463.53 |         |
|           |      | 106.25        |           |             | -.56  |           |         | 37.40   |
| 3         |      | .00           |           |             | -.37  |           |         | 28.19   |
|           |      | .00           | -.04      | 1.48        |       | 2.16      | 687.49  |         |
|           |      | 106.25        | -.04      | -3.05       |       | 2.16      | 916.46  |         |
|           |      | 106.25        |           |             | -.37  |           |         | 28.19   |
| 37 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.29  |           |         | -10.65  |
|           |      | .00           | .02       | -1.69       |       | -1.29     | 1890.70 |         |
|           |      | 106.25        | .02       | .85         |       | -1.29     | 1753.35 |         |
|           |      | 106.25        |           |             | -.29  |           |         | -10.65  |
| 2         |      | .00           |           |             | -.56  |           |         | -37.40  |
|           |      | .00           | .08       | -5.92       |       | -1.04     | 1463.53 |         |
|           |      | 106.25        | .08       | 2.90        |       | -1.04     | 1352.53 |         |
|           |      | 106.25        |           |             | -.56  |           |         | -37.40  |
| 3         |      | .00           |           |             | -.37  |           |         | -28.19  |
|           |      | .00           | .04       | -3.05       |       | -2.16     | 916.46  |         |
|           |      | 106.25        | .04       | 1.48        |       | -2.16     | 687.49  |         |
|           |      | 106.25        |           |             | -.37  |           |         | -28.19  |
| 40 -----  |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.24  |           |         | -49.05  |
|           |      | .00           | .27       | -14.33      |       | -10.28    | 718.14  |         |
|           |      | 106.25        | .27       | 14.22       |       | -10.28    | -373.62 |         |
|           |      | 106.25        |           |             | -.24  |           |         | -49.05  |
| 2         |      | .00           |           |             | -.34  |           |         | -215.14 |
|           |      | .00           | .86       | -45.91      |       | -9.65     | 624.78  |         |
|           |      | 106.25        | .86       | 45.29       |       | -9.65     | -400.86 |         |
|           |      | 106.25        |           |             | -.34  |           |         | -215.14 |
| 3         |      | .00           |           |             | -.26  |           |         | -134.65 |
|           |      | .00           | .42       | -22.52      |       | -4.75     | 267.02  |         |
|           |      | 106.25        | .42       | 22.60       |       | -4.75     | -237.22 |         |
|           |      | 106.25        |           |             | -.26  |           |         | -134.65 |

| F R A M E |       | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|-------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD  | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND  | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 41        | ----- |               |           |             |       |           |         |         |
|           | 1     | .00           |           |             | -.20  |           |         | 32.47   |
|           |       | .00           | -.15      | 8.12        |       | 7.62      | -183.22 |         |
|           |       | 106.25        | -.15      | -8.13       |       | 7.62      | 625.98  |         |
|           |       | 106.25        |           |             | -.20  |           |         | 32.47   |
|           | 2     | .00           |           |             | -.31  |           |         | 105.02  |
|           |       | .00           | -.56      | 29.63       |       | 7.73      | -259.20 |         |
|           |       | 106.25        | -.56      | -29.75      |       | 7.73      | 561.71  |         |
|           |       | 106.25        |           |             | -.31  |           |         | 105.02  |
|           | 3     | .00           |           |             | -.22  |           |         | 75.34   |
|           |       | .00           | -.28      | 14.95       |       | 3.65      | -155.88 |         |
|           |       | 106.25        | -.28      | -15.04      |       | 3.65      | 231.76  |         |
|           |       | 106.25        |           |             | -.22  |           |         | 75.34   |
| 44        | ----- |               |           |             |       |           |         |         |
|           | 1     | .00           |           |             | -.33  |           |         | 8.45    |
|           |       | .00           | -.02      | .78         |       | 1.31      | 1769.19 |         |
|           |       | 106.25        | -.02      | -1.34       |       | 1.31      | 1908.17 |         |
|           |       | 106.25        |           |             | -.33  |           |         | 8.45    |
|           | 2     | .00           |           |             | -.71  |           |         | 28.24   |
|           |       | .00           | -.07      | 2.62        |       | 1.10      | 1406.75 |         |
|           |       | 106.25        | -.07      | -4.70       |       | 1.10      | 1523.56 |         |
|           |       | 106.25        |           |             | -.71  |           |         | 28.24   |
|           | 3     | .00           |           |             | -.44  |           |         | 19.90   |
|           |       | .00           | -.03      | 1.29        |       | 1.69      | 752.69  |         |
|           |       | 106.25        | -.03      | -2.38       |       | 1.69      | 932.30  |         |
|           |       | 106.25        |           |             | -.44  |           |         | 19.90   |
| 45        | ----- |               |           |             |       |           |         |         |
|           | 1     | .00           |           |             | -.33  |           |         | -8.45   |
|           |       | .00           | .02       | -1.34       |       | -1.31     | 1908.17 |         |
|           |       | 106.25        | .02       | .78         |       | -1.31     | 1769.19 |         |
|           |       | 106.25        |           |             | -.33  |           |         | -8.45   |
|           | 2     | .00           |           |             | -.71  |           |         | -28.24  |
|           |       | .00           | .07       | -4.70       |       | -1.10     | 1523.56 |         |
|           |       | 106.25        | .07       | 2.62        |       | -1.10     | 1406.75 |         |
|           |       | 106.25        |           |             | -.71  |           |         | -28.24  |
|           | 3     | .00           |           |             | -.44  |           |         | -19.90  |
|           |       | .00           | .03       | -2.38       |       | -1.69     | 932.30  |         |
|           |       | 106.25        | .03       | 1.29        |       | -1.69     | 752.69  |         |
|           |       | 106.25        |           |             | -.44  |           |         | -19.90  |
| 48        | ----- |               |           |             |       |           |         |         |
|           | 1     | .00           |           |             | -.20  |           |         | -32.47  |
|           |       | .00           | .15       | -8.13       |       | -7.62     | 625.98  |         |
|           |       | 106.25        | .15       | 8.12        |       | -7.62     | -183.22 |         |
|           |       | 106.25        |           |             | -.20  |           |         | -32.47  |
|           | 2     | .00           |           |             | -.31  |           |         | -105.02 |
|           |       | .00           | .56       | -29.75      |       | -7.73     | 561.71  |         |
|           |       | 106.25        | .56       | 29.63       |       | -7.73     | -259.20 |         |
|           |       | 106.25        |           |             | -.31  |           |         | -105.02 |
|           | 3     | .00           |           |             | -.22  |           |         | -75.34  |
|           |       | .00           | .28       | -15.04      |       | -3.65     | 231.76  |         |
|           |       | 106.25        | .28       | 14.95       |       | -3.65     | -155.88 |         |
|           |       | 106.25        |           |             | -.22  |           |         | -75.34  |
| 49        | ----- |               |           |             |       |           |         |         |
|           | 1     | .00           |           |             | -.24  |           |         | 36.64   |
|           |       | .00           | -.07      | 3.62        |       | 10.19     | -369.40 |         |
|           |       | 106.25        | -.07      | -3.67       |       | 10.19     | 713.72  |         |
|           |       | 106.25        |           |             | -.24  |           |         | 36.64   |
|           | 2     | .00           |           |             | -.36  |           |         | 73.47   |
|           |       | .00           | -.37      | 19.75       |       | 9.24      | -378.76 |         |
|           |       | 106.25        | -.37      | -20.06      |       | 9.24      | 602.55  |         |
|           |       | 106.25        |           |             | -.36  |           |         | 73.47   |
|           | 3     | .00           |           |             | -.27  |           |         | 56.26   |
|           |       | .00           | -.20      | 10.26       |       | 4.62      | -232.82 |         |
|           |       | 106.25        | -.20      | -10.86      |       | 4.62      | 258.07  |         |
|           |       | 106.25        |           |             | -.27  |           |         | 56.26   |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |        |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|--------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL  |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ   |
| 52 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.35  |           |         | 5.92   |
|           |      | .00           | -.01      | .59         |       | 1.32      | 1780.81 |        |
|           |      | 106.25        | -.01      | -.91        |       | 1.32      | 1921.39 |        |
|           |      | 106.25        |           |             | -.35  |           |         | 5.92   |
| 2         |      | .00           |           |             | -.79  |           |         | 18.26  |
|           |      | .00           | -.05      | 1.96        |       | 1.15      | 1444.52 |        |
|           |      | 106.25        | -.05      | -3.22       |       | 1.15      | 1566.30 |        |
|           |      | 106.25        |           |             | -.79  |           |         | 18.26  |
| 3         |      | .00           |           |             | -.49  |           |         | 11.01  |
|           |      | .00           | -.02      | .92         |       | 2.23      | 752.29  |        |
|           |      | 106.25        | -.02      | -1.60       |       | 2.23      | 988.92  |        |
|           |      | 106.25        |           |             | -.49  |           |         | 11.01  |
| 53 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.35  |           |         | -5.92  |
|           |      | .00           | .01       | -.91        |       | -1.32     | 1921.39 |        |
|           |      | 106.25        | .01       | .59         |       | -1.32     | 1780.81 |        |
|           |      | 106.25        |           |             | -.35  |           |         | -5.92  |
| 2         |      | .00           |           |             | -.79  |           |         | -18.26 |
|           |      | .00           | .05       | -3.22       |       | -1.15     | 1566.30 |        |
|           |      | 106.25        | .05       | 1.96        |       | -1.15     | 1444.52 |        |
|           |      | 106.25        |           |             | -.79  |           |         | -18.26 |
| 3         |      | .00           |           |             | -.49  |           |         | -11.01 |
|           |      | .00           | .02       | -1.60       |       | -2.23     | 988.92  |        |
|           |      | 106.25        | .02       | .92         |       | -2.23     | 752.29  |        |
|           |      | 106.25        |           |             | -.49  |           |         | -11.01 |
| 56 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.24  |           |         | -36.64 |
|           |      | .00           | .07       | -3.67       |       | -10.19    | 713.72  |        |
|           |      | 106.25        | .07       | 3.62        |       | -10.19    | -369.40 |        |
|           |      | 106.25        |           |             | -.24  |           |         | -36.64 |
| 2         |      | .00           |           |             | -.36  |           |         | -73.47 |
|           |      | .00           | .37       | -20.06      |       | -9.24     | 602.55  |        |
|           |      | 106.25        | .37       | 19.75       |       | -9.24     | -378.76 |        |
|           |      | 106.25        |           |             | -.36  |           |         | -73.47 |
| 3         |      | .00           |           |             | -.27  |           |         | -56.26 |
|           |      | .00           | .20       | -10.86      |       | -4.62     | 258.07  |        |
|           |      | 106.25        | .20       | 10.26       |       | -4.62     | -232.82 |        |
|           |      | 106.25        |           |             | -.27  |           |         | -56.26 |
| 57 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.23  |           |         | 5.74   |
|           |      | .00           | -.09      | 5.19        |       | 10.30     | -375.08 |        |
|           |      | 106.25        | -.09      | -4.55       |       | 10.30     | 719.22  |        |
|           |      | 106.25        |           |             | -.23  |           |         | 5.74   |
| 2         |      | .00           |           |             | -.37  |           |         | 14.70  |
|           |      | .00           | -.20      | 11.12       |       | 8.90      | -359.76 |        |
|           |      | 106.25        | -.20      | -10.26      |       | 8.90      | 585.73  |        |
|           |      | 106.25        |           |             | -.37  |           |         | 14.70  |
| 3         |      | .00           |           |             | -.30  |           |         | 16.15  |
|           |      | .00           | -.11      | 6.40        |       | 4.90      | -236.95 |        |
|           |      | 106.25        | -.11      | -5.75       |       | 4.90      | 283.85  |        |
|           |      | 106.25        |           |             | -.30  |           |         | 16.15  |
| 60 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.36  |           |         | 3.24   |
|           |      | .00           | -.01      | .31         |       | 1.33      | 1788.28 |        |
|           |      | 106.25        | -.01      | -.42        |       | 1.33      | 1929.79 |        |
|           |      | 106.25        |           |             | -.36  |           |         | 3.24   |
| 2         |      | .00           |           |             | -.83  |           |         | 9.14   |
|           |      | .00           | -.02      | 1.00        |       | 1.18      | 1466.45 |        |
|           |      | 106.25        | -.02      | -1.53       |       | 1.18      | 1591.57 |        |
|           |      | 106.25        |           |             | -.83  |           |         | 9.14   |
| 3         |      | .00           |           |             | -.52  |           |         | -2.86  |
|           |      | .00           | -.01      | .44         |       | 1.19      | 823.53  |        |
|           |      | 106.25        | -.01      | -.75        |       | 1.19      | 950.00  |        |
|           |      | 106.25        |           |             | -.52  |           |         | -2.86  |

| F R A M E |       | E L E M E N T |           | F O R C E S |       |           |         |        |
|-----------|-------|---------------|-----------|-------------|-------|-----------|---------|--------|
| ELT       | LOAD  | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL  |
| ID        | COND  | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ   |
| 61        | ----- |               |           |             |       |           |         |        |
| 1         |       | .00           |           |             | -.36  |           |         | -3.24  |
|           |       | .00           | .01       | -.42        |       | -1.33     | 1929.79 |        |
|           |       | 106.25        | .01       | .31         |       | -1.33     | 1788.28 |        |
|           |       | 106.25        |           |             | -.36  |           |         | -3.24  |
| 2         |       | .00           |           |             | -.83  |           |         | -9.14  |
|           |       | .00           | .02       | -1.53       |       | -1.18     | 1591.57 |        |
|           |       | 106.25        | .02       | 1.00        |       | -1.18     | 1466.45 |        |
|           |       | 106.25        |           |             | -.83  |           |         | -9.14  |
| 3         |       | .00           |           |             | -.52  |           |         | 2.86   |
|           |       | .00           | .01       | -.75        |       | -1.19     | 950.00  |        |
|           |       | 106.25        | .01       | .44         |       | -1.19     | 823.53  |        |
|           |       | 106.25        |           |             | -.52  |           |         | 2.86   |
| 64        | ----- |               |           |             |       |           |         |        |
| 1         |       | .00           |           |             | -.23  |           |         | -5.74  |
|           |       | .00           | .09       | -4.55       |       | -10.30    | 719.22  |        |
|           |       | 106.25        | .09       | 5.19        |       | -10.30    | -375.08 |        |
|           |       | 106.25        |           |             | -.23  |           |         | -5.74  |
| 2         |       | .00           |           |             | -.37  |           |         | -14.70 |
|           |       | .00           | .20       | -10.26      |       | -8.90     | 585.73  |        |
|           |       | 106.25        | .20       | 11.12       |       | -8.90     | -359.76 |        |
|           |       | 106.25        |           |             | -.37  |           |         | -14.70 |
| 3         |       | .00           |           |             | -.30  |           |         | -16.15 |
|           |       | .00           | .11       | -5.75       |       | -4.90     | 283.85  |        |
|           |       | 106.25        | .11       | 6.40        |       | -4.90     | -236.95 |        |
|           |       | 106.25        |           |             | -.30  |           |         | -16.15 |
| 65        | ----- |               |           |             |       |           |         |        |
| 1         |       | .00           |           |             | -.17  |           |         | 4.16   |
|           |       | .00           | .02       | -.94        |       | 7.62      | -182.61 |        |
|           |       | 106.25        | .02       | .97         |       | 7.62      | 627.48  |        |
|           |       | 106.25        |           |             | -.17  |           |         | 4.16   |
| 2         |       | .00           |           |             | -.29  |           |         | 7.32   |
|           |       | .00           | .03       | -1.73       |       | 6.35      | -180.09 |        |
|           |       | 106.25        | .03       | 1.77        |       | 6.35      | 494.63  |        |
|           |       | 106.25        |           |             | -.29  |           |         | 7.32   |
| 3         |       | .00           |           |             | -.23  |           |         | 4.66   |
|           |       | .00           | .02       | -.91        |       | 3.57      | -132.54 |        |
|           |       | 106.25        | .02       | .93         |       | 3.57      | 246.73  |        |
|           |       | 106.25        |           |             | -.23  |           |         | 4.66   |
| 68        | ----- |               |           |             |       |           |         |        |
| 1         |       | .00           |           |             | -.36  |           |         | .59    |
|           |       | .00           | .00       | -.02        |       | 1.33      | 1791.57 |        |
|           |       | 106.25        | .00       | .09         |       | 1.33      | 1933.25 |        |
|           |       | 106.25        |           |             | -.36  |           |         | .59    |
| 2         |       | .00           |           |             | -.84  |           |         | 1.17   |
|           |       | .00           | .00       | -.15        |       | 1.19      | 1474.80 |        |
|           |       | 106.25        | .00       | .26         |       | 1.19      | 1601.03 |        |
|           |       | 106.25        |           |             | -.84  |           |         | 1.17   |
| 3         |       | .00           |           |             | -.52  |           |         | .80    |
|           |       | .00           | .00       | -.08        |       | .74       | 853.24  |        |
|           |       | 106.25        | .00       | .13         |       | .74       | 932.35  |        |
|           |       | 106.25        |           |             | -.52  |           |         | .80    |
| 69        | ----- |               |           |             |       |           |         |        |
| 1         |       | .00           |           |             | -.36  |           |         | -.59   |
|           |       | .00           | .00       | .09         |       | -1.33     | 1933.25 |        |
|           |       | 106.25        | .00       | -.02        |       | -1.33     | 1791.57 |        |
|           |       | 106.25        |           |             | -.36  |           |         | -.59   |
| 2         |       | .00           |           |             | -.84  |           |         | -1.17  |
|           |       | .00           | -.00      | .26         |       | -1.19     | 1601.03 |        |
|           |       | 106.25        | -.00      | -.15        |       | -1.19     | 1474.80 |        |
|           |       | 106.25        |           |             | -.84  |           |         | -1.17  |
| 3         |       | .00           |           |             | -.52  |           |         | -.80   |
|           |       | .00           | -.00      | .13         |       | -.74      | 932.35  |        |
|           |       | 106.25        | -.00      | -.08        |       | -.74      | 853.24  |        |
|           |       | 106.25        |           |             | -.52  |           |         | -.80   |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |       |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|-------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ  |
| 72 -----  |      |               |           |             |       |           |         |       |
| 1         |      | .00           |           |             | -.17  |           |         | -4.16 |
|           |      | .00           | -.02      | .97         |       | -7.62     | 627.48  |       |
|           |      | 106.25        | -.02      | -.94        |       | -7.62     | -182.61 |       |
|           |      | 106.25        |           |             | -.17  |           |         | -4.16 |
| 2         |      | .00           |           |             | -.29  |           |         | -7.32 |
|           |      | .00           | -.03      | 1.77        |       | -6.35     | 494.63  |       |
|           |      | 106.25        | -.03      | -1.73       |       | -6.35     | -180.09 |       |
|           |      | 106.25        |           |             | -.29  |           |         | -7.32 |
| 3         |      | .00           |           |             | -.23  |           |         | -4.66 |
|           |      | .00           | -.02      | .93         |       | -3.57     | 246.73  |       |
|           |      | 106.25        | -.02      | -.91        |       | -3.57     | -132.54 |       |
|           |      | 106.25        |           |             | -.23  |           |         | -4.66 |
| 73 -----  |      |               |           |             |       |           |         |       |
| 1         |      | .00           |           |             | -.22  |           |         | -1.24 |
|           |      | .00           | .13       | -7.25       |       | 10.36     | -377.58 |       |
|           |      | 106.25        | .13       | 6.77        |       | 10.36     | 722.92  |       |
|           |      | 106.25        |           |             | -.22  |           |         | -1.24 |
| 2         |      | .00           |           |             | -.36  |           |         | -5.35 |
|           |      | .00           | .27       | -14.88      |       | 8.98      | -363.20 |       |
|           |      | 106.25        | .27       | 14.23       |       | 8.98      | 591.04  |       |
|           |      | 106.25        |           |             | -.36  |           |         | -5.35 |
| 3         |      | .00           |           |             | -.30  |           |         | -9.53 |
|           |      | .00           | .15       | -8.38       |       | 4.95      | -238.73 |       |
|           |      | 106.25        | .15       | 7.83        |       | 4.95      | 286.70  |       |
|           |      | 106.25        |           |             | -.30  |           |         | -9.53 |
| 76 -----  |      |               |           |             |       |           |         |       |
| 1         |      | .00           |           |             | -.35  |           |         | -2.09 |
|           |      | .00           | .01       | -.35        |       | 1.33      | 1790.24 |       |
|           |      | 106.25        | .01       | .60         |       | 1.33      | 1931.89 |       |
|           |      | 106.25        |           |             | -.35  |           |         | -2.09 |
| 2         |      | .00           |           |             | -.82  |           |         | -6.84 |
|           |      | .00           | .03       | -1.28       |       | 1.18      | 1470.33 |       |
|           |      | 106.25        | .03       | 2.05        |       | 1.18      | 1595.77 |       |
|           |      | 106.25        |           |             | -.82  |           |         | -6.84 |
| 3         |      | .00           |           |             | -.51  |           |         | 4.45  |
|           |      | .00           | .02       | -.60        |       | 1.19      | 826.21  |       |
|           |      | 106.25        | .02       | 1.02        |       | 1.19      | 952.89  |       |
|           |      | 106.25        |           |             | -.51  |           |         | 4.45  |
| 77 -----  |      |               |           |             |       |           |         |       |
| 1         |      | .00           |           |             | -.35  |           |         | 2.09  |
|           |      | .00           | -.01      | .60         |       | -1.33     | 1931.89 |       |
|           |      | 106.25        | -.01      | -.35        |       | -1.33     | 1790.24 |       |
|           |      | 106.25        |           |             | -.35  |           |         | 2.09  |
| 2         |      | .00           |           |             | -.82  |           |         | 6.84  |
|           |      | .00           | -.03      | 2.05        |       | -1.18     | 1595.77 |       |
|           |      | 106.25        | -.03      | -1.28       |       | -1.18     | 1470.33 |       |
|           |      | 106.25        |           |             | -.82  |           |         | 6.84  |
| 3         |      | .00           |           |             | -.51  |           |         | -4.45 |
|           |      | .00           | -.02      | 1.02        |       | -1.19     | 952.89  |       |
|           |      | 106.25        | -.02      | -.60        |       | -1.19     | 826.21  |       |
|           |      | 106.25        |           |             | -.51  |           |         | -4.45 |
| 80 -----  |      |               |           |             |       |           |         |       |
| 1         |      | .00           |           |             | -.22  |           |         | 1.24  |
|           |      | .00           | -.13      | 6.77        |       | -10.36    | 722.92  |       |
|           |      | 106.25        | -.13      | -7.25       |       | -10.36    | -377.58 |       |
|           |      | 106.25        |           |             | -.22  |           |         | 1.24  |
| 2         |      | .00           |           |             | -.36  |           |         | 5.35  |
|           |      | .00           | -.27      | 14.23       |       | -8.98     | 591.04  |       |
|           |      | 106.25        | -.27      | -14.88      |       | -8.98     | -363.20 |       |
|           |      | 106.25        |           |             | -.36  |           |         | 5.35  |
| 3         |      | .00           |           |             | -.30  |           |         | 9.53  |
|           |      | .00           | -.15      | 7.83        |       | -4.95     | 286.70  |       |
|           |      | 106.25        | -.15      | -8.38       |       | -4.95     | -238.73 |       |
|           |      | 106.25        |           |             | -.30  |           |         | 9.53  |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |        |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|--------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL  |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ   |
| 81 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.23  |           |         | -32.51 |
|           |      | .00           | .10       | -5.27       |       | 10.20     | -368.69 |        |
|           |      | 106.25        | .10       | 5.44        |       | 10.20     | 714.87  |        |
|           |      | 106.25        |           |             | -.23  |           |         | -32.51 |
| 2         |      | .00           |           |             | -.34  |           |         | -64.55 |
|           |      | .00           | .44       | -23.07      |       | 9.25      | -378.00 |        |
|           |      | 106.25        | .44       | 23.54       |       | 9.25      | 604.48  |        |
|           |      | 106.25        |           |             | -.34  |           |         | -64.55 |
| 3         |      | .00           |           |             | -.27  |           |         | -49.78 |
|           |      | .00           | .23       | -12.02      |       | 4.63      | -232.68 |        |
|           |      | 106.25        | .23       | 12.70       |       | 4.63      | 259.38  |        |
|           |      | 106.25        |           |             | -.27  |           |         | -49.78 |
| 84 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.33  |           |         | -4.84  |
|           |      | .00           | .02       | -.62        |       | 1.33      | 1784.64 |        |
|           |      | 106.25        | .02       | 1.07        |       | 1.33      | 1925.50 |        |
|           |      | 106.25        |           |             | -.33  |           |         | -4.84  |
| 2         |      | .00           |           |             | -.77  |           |         | -16.05 |
|           |      | .00           | .06       | -2.22       |       | 1.15      | 1452.18 |        |
|           |      | 106.25        | .06       | 3.71        |       | 1.15      | 1574.58 |        |
|           |      | 106.25        |           |             | -.77  |           |         | -16.05 |
| 3         |      | .00           |           |             | -.48  |           |         | -9.45  |
|           |      | .00           | .03       | -1.05       |       | 2.23      | 757.60  |        |
|           |      | 106.25        | .03       | 1.86        |       | 2.23      | 994.66  |        |
|           |      | 106.25        |           |             | -.48  |           |         | -9.45  |
| 85 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.33  |           |         | 4.84   |
|           |      | .00           | -.02      | 1.07        |       | -1.33     | 1925.50 |        |
|           |      | 106.25        | -.02      | -.62        |       | -1.33     | 1784.64 |        |
|           |      | 106.25        |           |             | -.33  |           |         | 4.84   |
| 2         |      | .00           |           |             | -.77  |           |         | 16.05  |
|           |      | .00           | -.06      | 3.71        |       | -1.15     | 1574.58 |        |
|           |      | 106.25        | -.06      | -2.22       |       | -1.15     | 1452.18 |        |
|           |      | 106.25        |           |             | -.77  |           |         | 16.05  |
| 3         |      | .00           |           |             | -.48  |           |         | 9.45   |
|           |      | .00           | -.03      | 1.86        |       | -2.23     | 994.66  |        |
|           |      | 106.25        | -.03      | -1.05       |       | -2.23     | 757.60  |        |
|           |      | 106.25        |           |             | -.48  |           |         | 9.45   |
| 88 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.23  |           |         | 32.51  |
|           |      | .00           | -.10      | 5.44        |       | -10.20    | 714.87  |        |
|           |      | 106.25        | -.10      | -5.27       |       | -10.20    | -368.69 |        |
|           |      | 106.25        |           |             | -.23  |           |         | 32.51  |
| 2         |      | .00           |           |             | -.34  |           |         | 64.55  |
|           |      | .00           | -.44      | 23.54       |       | -9.25     | 604.48  |        |
|           |      | 106.25        | -.44      | -23.07      |       | -9.25     | -378.00 |        |
|           |      | 106.25        |           |             | -.34  |           |         | 64.55  |
| 3         |      | .00           |           |             | -.27  |           |         | 49.78  |
|           |      | .00           | -.23      | 12.70       |       | -4.63     | 259.38  |        |
|           |      | 106.25        | -.23      | -12.02      |       | -4.63     | -232.68 |        |
|           |      | 106.25        |           |             | -.27  |           |         | 49.78  |
| 89 -----  |      |               |           |             |       |           |         |        |
| 1         |      | .00           |           |             | -.18  |           |         | -26.24 |
|           |      | .00           | .17       | -9.23       |       | 7.64      | -182.93 |        |
|           |      | 106.25        | .17       | 9.29        |       | 7.64      | 628.68  |        |
|           |      | 106.25        |           |             | -.18  |           |         | -26.24 |
| 2         |      | .00           |           |             | -.29  |           |         | -92.61 |
|           |      | .00           | .61       | -32.23      |       | 7.78      | -259.46 |        |
|           |      | 106.25        | .61       | 32.42       |       | 7.78      | 566.64  |        |
|           |      | 106.25        |           |             | -.29  |           |         | -92.61 |
| 3         |      | .00           |           |             | -.21  |           |         | -66.90 |
|           |      | .00           | .31       | -16.35      |       | 3.68      | -156.14 |        |
|           |      | 106.25        | .31       | 16.47       |       | 3.68      | 234.76  |        |
|           |      | 106.25        |           |             | -.21  |           |         | -66.90 |

E133 (513+360) TRAMO Va

PROGRAM:SAP90/FILE:pi513.F3F

## F R A M E E L E M E N T F O R C E S

| ELT | LOAD | DIST   | 1-2 PLANE |        | AXIAL | 1-3 PLANE |         | AXIAL   |
|-----|------|--------|-----------|--------|-------|-----------|---------|---------|
| ID  | COND | ENDI   | SHEAR     | MOMENT | FORCE | SHEAR     | MOMENT  | TORQ    |
| 92  |      |        |           |        |       |           |         |         |
|     | 1    | .00    |           |        | -.30  |           |         | -7.46   |
|     |      | .00    | .02       | -.80   |       | 1.31      | 1774.76 |         |
|     |      | 106.25 | .02       | 1.47   |       | 1.31      | 1914.14 |         |
|     |      | 106.25 |           |        | -.30  |           |         | -7.46   |
|     | 2    | .00    |           |        | -.67  |           |         | -26.17  |
|     |      | .00    | .07       | -2.82  |       | 1.11      | 1418.00 |         |
|     |      | 106.25 | .07       | 5.14   |       | 1.11      | 1535.71 |         |
|     |      | 106.25 |           |        | -.67  |           |         | -26.17  |
|     | 3    | .00    |           |        | -.42  |           |         | -18.38  |
|     |      | .00    | .04       | -1.39  |       | 1.70      | 760.58  |         |
|     |      | 106.25 | .04       | 2.61   |       | 1.70      | 940.83  |         |
|     |      | 106.25 |           |        | -.42  |           |         | -18.38  |
| 93  |      |        |           |        |       |           |         |         |
|     | 1    | .00    |           |        | -.30  |           |         | 7.46    |
|     |      | .00    | -.02      | 1.47   |       | -1.31     | 1914.14 |         |
|     |      | 106.25 | -.02      | -.80   |       | -1.31     | 1774.76 |         |
|     |      | 106.25 |           |        | -.30  |           |         | 7.46    |
|     | 2    | .00    |           |        | -.67  |           |         | 26.17   |
|     |      | .00    | -.07      | 5.14   |       | -1.11     | 1535.71 |         |
|     |      | 106.25 | -.07      | -2.82  |       | -1.11     | 1418.00 |         |
|     |      | 106.25 |           |        | -.67  |           |         | 26.17   |
|     | 3    | .00    |           |        | -.42  |           |         | 18.38   |
|     |      | .00    | -.04      | 2.61   |       | -1.70     | 940.83  |         |
|     |      | 106.25 | -.04      | -1.39  |       | -1.70     | 760.58  |         |
|     |      | 106.25 |           |        | -.42  |           |         | 18.38   |
| 96  |      |        |           |        |       |           |         |         |
|     | 1    | .00    |           |        | -.18  |           |         | 26.24   |
|     |      | .00    | -.17      | 9.29   |       | -7.64     | 628.68  |         |
|     |      | 106.25 | -.17      | -9.23  |       | -7.64     | -182.93 |         |
|     |      | 106.25 |           |        | -.18  |           |         | 26.24   |
|     | 2    | .00    |           |        | -.29  |           |         | 92.61   |
|     |      | .00    | -.61      | 32.42  |       | -7.78     | 566.64  |         |
|     |      | 106.25 | -.61      | -32.23 |       | -7.78     | -259.46 |         |
|     |      | 106.25 |           |        | -.29  |           |         | 92.61   |
|     | 3    | .00    |           |        | -.21  |           |         | 66.90   |
|     |      | .00    | -.31      | 16.47  |       | -3.68     | 234.76  |         |
|     |      | 106.25 | -.31      | -16.35 |       | -3.68     | -156.14 |         |
|     |      | 106.25 |           |        | -.21  |           |         | 66.90   |
| 97  |      |        |           |        |       |           |         |         |
|     | 1    | .00    |           |        | -.22  |           |         | -44.64  |
|     |      | .00    | .28       | -14.91 |       | 10.34     | -374.53 |         |
|     |      | 106.25 | .28       | 15.15  |       | 10.34     | 723.61  |         |
|     |      | 106.25 |           |        | -.22  |           |         | -44.64  |
|     | 2    | .00    |           |        | -.32  |           |         | -206.10 |
|     |      | .00    | .90       | -47.47 |       | 9.78      | -404.07 |         |
|     |      | 106.25 | .90       | 48.27  |       | 9.78      | 634.77  |         |
|     |      | 106.25 |           |        | -.32  |           |         | -206.10 |
|     | 3    | .00    |           |        | -.25  |           |         | -127.91 |
|     |      | .00    | .45       | -23.80 |       | 4.82      | -239.44 |         |
|     |      | 106.25 | .45       | 23.81  |       | 4.82      | 272.98  |         |
|     |      | 106.25 |           |        | -.25  |           |         | -127.91 |
| 100 |      |        |           |        |       |           |         |         |
|     | 1    | .00    |           |        | -.25  |           |         | -9.76   |
|     |      | .00    | .02       | -.86   |       | 1.30      | 1760.51 |         |
|     |      | 106.25 | .02       | 1.79   |       | 1.30      | 1898.35 |         |
|     |      | 106.25 |           |        | -.25  |           |         | -9.76   |
|     | 2    | .00    |           |        | -.51  |           |         | -35.52  |
|     |      | .00    | .09       | -2.99  |       | 1.06      | 1367.08 |         |
|     |      | 106.25 | .09       | 6.28   |       | 1.06      | 1479.23 |         |
|     |      | 106.25 |           |        | -.51  |           |         | -35.52  |
|     | 3    | .00    |           |        | -.34  |           |         | -26.75  |
|     |      | .00    | .04       | -1.52  |       | 2.16      | 697.84  |         |
|     |      | 106.25 | .04       | 3.22   |       | 2.16      | 927.67  |         |
|     |      | 106.25 |           |        | -.34  |           |         | -26.75  |

| F R A M E |      | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 101 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.25  |           |         | 9.76    |
|           |      | .00           | -.02      | 1.79        |       | -1.30     | 1898.35 |         |
|           |      | 106.25        | -.02      | -.86        |       | -1.30     | 1760.51 |         |
|           |      | 106.25        |           |             | -.25  |           |         | 9.76    |
| 2         |      | .00           |           |             | -.51  |           |         | 35.52   |
|           |      | .00           | -.09      | 6.28        |       | -1.06     | 1479.23 |         |
|           |      | 106.25        | -.09      | -2.99       |       | -1.06     | 1367.08 |         |
|           |      | 106.25        |           |             | -.51  |           |         | 35.52   |
| 3         |      | .00           |           |             | -.34  |           |         | 26.75   |
|           |      | .00           | -.04      | 3.22        |       | -2.16     | 927.67  |         |
|           |      | 106.25        | -.04      | -1.52       |       | -2.16     | 697.84  |         |
|           |      | 106.25        |           |             | -.34  |           |         | 26.75   |
| 104 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.22  |           |         | 44.64   |
|           |      | .00           | -.28      | 15.15       |       | -10.34    | 723.61  |         |
|           |      | 106.25        | -.28      | -14.91      |       | -10.34    | -374.53 |         |
|           |      | 106.25        |           |             | -.22  |           |         | 44.64   |
| 2         |      | .00           |           |             | -.32  |           |         | 206.10  |
|           |      | .00           | -.90      | 48.27       |       | -9.78     | 634.77  |         |
|           |      | 106.25        | -.90      | -47.47      |       | -9.78     | -404.07 |         |
|           |      | 106.25        |           |             | -.32  |           |         | 206.10  |
| 3         |      | .00           |           |             | -.25  |           |         | 127.91  |
|           |      | .00           | -.45      | 23.81       |       | -4.82     | 272.98  |         |
|           |      | 106.25        | -.45      | -23.80      |       | -4.82     | -239.44 |         |
|           |      | 106.25        |           |             | -.25  |           |         | 127.91  |
| 105 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.15  |           |         | -72.41  |
|           |      | .00           | .22       | -11.40      |       | 9.66      | -334.08 |         |
|           |      | 106.25        | .22       | 12.12       |       | 9.66      | 691.93  |         |
|           |      | 106.25        |           |             | -.15  |           |         | -72.41  |
| 2         |      | .00           |           |             | -.10  |           |         | -256.09 |
|           |      | .00           | .96       | -50.15      |       | 6.69      | -225.33 |         |
|           |      | 106.25        | .96       | 51.66       |       | 6.69      | 485.57  |         |
|           |      | 106.25        |           |             | -.10  |           |         | -256.09 |
| 3         |      | .00           |           |             | -.13  |           |         | -160.88 |
|           |      | .00           | .46       | -24.22      |       | 3.56      | -149.92 |         |
|           |      | 106.25        | .46       | 25.10       |       | 3.56      | 228.84  |         |
|           |      | 106.25        |           |             | -.13  |           |         | -160.88 |
| 108 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.19  |           |         | -11.38  |
|           |      | .00           | .03       | -.73        |       | 1.28      | 1743.12 |         |
|           |      | 106.25        | .03       | 2.00        |       | 1.28      | 1878.96 |         |
|           |      | 106.25        |           |             | -.19  |           |         | -11.38  |
| 2         |      | .00           |           |             | -.27  |           |         | -41.80  |
|           |      | .00           | .09       | -2.54       |       | .99       | 1303.17 |         |
|           |      | 106.25        | .09       | 7.02        |       | .99       | 1408.48 |         |
|           |      | 106.25        |           |             | -.27  |           |         | -41.80  |
| 3         |      | .00           |           |             | -.22  |           |         | -38.63  |
|           |      | .00           | .05       | -1.31       |       | 1.07      | 707.76  |         |
|           |      | 106.25        | .05       | 3.62        |       | 1.07      | 821.87  |         |
|           |      | 106.25        |           |             | -.22  |           |         | -38.63  |
| 109 ----- |      |               |           |             |       |           |         |         |
| 1         |      | .00           |           |             | -.19  |           |         | 11.38   |
|           |      | .00           | -.03      | 2.00        |       | -1.28     | 1878.96 |         |
|           |      | 106.25        | -.03      | -.73        |       | -1.28     | 1743.12 |         |
|           |      | 106.25        |           |             | -.19  |           |         | 11.38   |
| 2         |      | .00           |           |             | -.27  |           |         | 41.80   |
|           |      | .00           | -.09      | 7.02        |       | -.99      | 1408.48 |         |
|           |      | 106.25        | -.09      | -2.54       |       | -.99      | 1303.17 |         |
|           |      | 106.25        |           |             | -.27  |           |         | 41.80   |
| 3         |      | .00           |           |             | -.22  |           |         | 38.63   |
|           |      | .00           | -.05      | 3.62        |       | -1.07     | 821.87  |         |
|           |      | 106.25        | -.05      | -1.31       |       | -1.07     | 707.76  |         |
|           |      | 106.25        |           |             | -.22  |           |         | 38.63   |

C S I / S A P 9 0 - - F I N I T E E L E M E N T A N A L Y S I S O F S T R U C T U R E S P A G E 13  
E133 (513+360) TRAMO Va PROGRAM:SAP90/FILE:pi513.F3F

| F R A M E |        | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|--------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD   | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND   | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 112       | ----   |               |           |             |       |           |         |         |
| 1         | .00    |               |           |             | -.15  |           |         | 72.41   |
|           | .00    |               | -.22      | 12.12       |       | -9.66     | 691.93  |         |
|           | 106.25 |               | -.22      | -11.40      |       | -9.66     | -334.08 |         |
|           | 106.25 |               |           |             | -.15  |           |         | 72.41   |
| 2         | .00    |               |           |             | -.10  |           |         | 256.09  |
|           | .00    |               | -.96      | 51.66       |       | -6.69     | 485.57  |         |
|           | 106.25 |               | -.96      | -50.15      |       | -6.69     | -225.33 |         |
|           | 106.25 |               |           |             | -.10  |           |         | 256.09  |
| 3         | .00    |               |           |             | -.13  |           |         | 160.88  |
|           | .00    |               | -.46      | 25.10       |       | -3.56     | 228.84  |         |
|           | 106.25 |               | -.46      | -24.22      |       | -3.56     | -149.92 |         |
|           | 106.25 |               |           |             | -.13  |           |         | 160.88  |
| 113       | ----   |               |           |             |       |           |         |         |
| 1         | .00    |               |           |             | -.10  |           |         | -49.49  |
|           | .00    |               | .21       | -11.27      |       | 7.03      | -144.67 |         |
|           | 106.25 |               | .21       | 11.46       |       | 7.03      | 602.77  |         |
|           | 106.25 |               |           |             | -.10  |           |         | -49.49  |
| 2         | .00    |               |           |             | -.03  |           |         | -175.62 |
|           | .00    |               | .79       | -41.55      |       | 4.59      | -72.61  |         |
|           | 106.25 |               | .79       | 42.44       |       | 4.59      | 414.70  |         |
|           | 106.25 |               |           |             | -.03  |           |         | -175.62 |
| 3         | .00    |               |           |             | -.08  |           |         | -124.96 |
|           | .00    |               | .39       | -20.59      |       | 2.41      | -51.46  |         |
|           | 106.25 |               | .39       | 21.03       |       | 2.41      | 204.64  |         |
|           | 106.25 |               |           |             | -.08  |           |         | -124.96 |
| 116       | ----   |               |           |             |       |           |         |         |
| 1         | .00    |               |           |             | -.09  |           |         | -12.00  |
|           | .00    |               | .02       | -.29        |       | 1.26      | 1723.89 |         |
|           | 106.25 |               | .02       | 2.00        |       | 1.26      | 1857.56 |         |
|           | 106.25 |               |           |             | -.09  |           |         | -12.00  |
| 2         | .00    |               |           |             | .08   |           |         | -43.98  |
|           | .00    |               | .08       | -.98        |       | .92       | 1232.23 |         |
|           | 106.25 |               | .08       | 7.05        |       | .92       | 1329.98 |         |
|           | 106.25 |               |           |             | .08   |           |         | -43.98  |
| 3         | .00    |               |           |             | -.03  |           |         | -32.48  |
|           | .00    |               | .04       | -.49        |       | .54       | 683.01  |         |
|           | 106.25 |               | .04       | 3.63        |       | .54       | 740.52  |         |
|           | 106.25 |               |           |             | -.03  |           |         | -32.48  |
| 117       | ----   |               |           |             |       |           |         |         |
| 1         | .00    |               |           |             | -.09  |           |         | 12.00   |
|           | .00    |               | -.02      | 2.00        |       | -1.26     | 1857.56 |         |
|           | 106.25 |               | -.02      | -.29        |       | -1.26     | 1723.89 |         |
|           | 106.25 |               |           |             | -.09  |           |         | 12.00   |
| 2         | .00    |               |           |             | .08   |           |         | 43.98   |
|           | .00    |               | -.08      | 7.05        |       | -.92      | 1329.98 |         |
|           | 106.25 |               | -.08      | -.98        |       | -.92      | 1232.23 |         |
|           | 106.25 |               |           |             | .08   |           |         | 43.98   |
| 3         | .00    |               |           |             | -.03  |           |         | 32.48   |
|           | .00    |               | -.04      | 3.63        |       | -.54      | 740.52  |         |
|           | 106.25 |               | -.04      | -.49        |       | -.54      | 683.01  |         |
|           | 106.25 |               |           |             | -.03  |           |         | 32.48   |
| 120       | ----   |               |           |             |       |           |         |         |
| 1         | .00    |               |           |             | -.10  |           |         | 49.49   |
|           | .00    |               | -.21      | 11.46       |       | -7.03     | 602.77  |         |
|           | 106.25 |               | -.21      | -11.27      |       | -7.03     | -144.67 |         |
|           | 106.25 |               |           |             | -.10  |           |         | 49.49   |
| 2         | .00    |               |           |             | -.03  |           |         | 175.62  |
|           | .00    |               | -.79      | 42.44       |       | -4.59     | 414.70  |         |
|           | 106.25 |               | -.79      | -41.55      |       | -4.59     | -72.61  |         |
|           | 106.25 |               |           |             | -.03  |           |         | 175.62  |
| 3         | .00    |               |           |             | -.08  |           |         | 124.96  |
|           | .00    |               | -.39      | 21.03       |       | -2.41     | 204.64  |         |
|           | 106.25 |               | -.39      | -20.59      |       | -2.41     | -51.46  |         |
|           | 106.25 |               |           |             | -.08  |           |         | 124.96  |

| F R A M E |       | E L E M E N T |           | F O R C E S |       |           |         |         |
|-----------|-------|---------------|-----------|-------------|-------|-----------|---------|---------|
| ELT       | LOAD  | DIST          | 1-2 PLANE |             | AXIAL | 1-3 PLANE |         | AXIAL   |
| ID        | COND  | ENDI          | SHEAR     | MOMENT      | FORCE | SHEAR     | MOMENT  | TORQ    |
| 121       | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | -.14  |           |         | -84.17  |
|           |       | .00           | .46       | -22.97      |       | 12.99     | -423.63 |         |
|           |       | 106.25        | .46       | 25.56       |       | 12.99     | 956.18  |         |
|           |       | 106.25        |           |             | -.14  |           |         | -84.17  |
| 2         |       | .00           |           |             | .09   |           |         | -312.29 |
|           |       | .00           | 1.48      | -73.89      |       | 8.41      | -230.22 |         |
|           |       | 106.25        | 1.48      | 83.44       |       | 8.41      | 663.42  |         |
|           |       | 106.25        |           |             | .09   |           |         | -312.29 |
| 3         |       | .00           |           |             | -.07  |           |         | -200.80 |
|           |       | .00           | .75       | -38.10      |       | 4.36      | -130.19 |         |
|           |       | 106.25        | .75       | 41.72       |       | 4.36      | 333.37  |         |
|           |       | 106.25        |           |             | -.07  |           |         | -200.80 |
| 124       | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | .09   |           |         | -16.68  |
|           |       | .00           | .02       | 3.13        |       | 1.75      | 2404.10 |         |
|           |       | 106.25        | .02       | 5.69        |       | 1.75      | 2589.95 |         |
|           |       | 106.25        |           |             | .09   |           |         | -16.68  |
| 2         |       | .00           |           |             | .89   |           |         | -60.71  |
|           |       | .00           | .08       | 11.19       |       | 1.19      | 1637.34 |         |
|           |       | 106.25        | .08       | 20.15       |       | 1.19      | 1763.89 |         |
|           |       | 106.25        |           |             | .89   |           |         | -60.71  |
| 3         |       | .00           |           |             | .35   |           |         | -41.92  |
|           |       | .00           | .04       | 5.91        |       | .65       | 894.87  |         |
|           |       | 106.25        | .04       | 10.33       |       | .65       | 963.79  |         |
|           |       | 106.25        |           |             | .35   |           |         | -41.92  |
| 125       | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | .09   |           |         | 16.68   |
|           |       | .00           | -.02      | 5.69        |       | -1.75     | 2589.95 |         |
|           |       | 106.25        | -.02      | 3.13        |       | -1.75     | 2404.10 |         |
|           |       | 106.25        |           |             | .09   |           |         | 16.68   |
| 2         |       | .00           |           |             | .89   |           |         | 60.71   |
|           |       | .00           | -.08      | 20.15       |       | -1.19     | 1763.89 |         |
|           |       | 106.25        | -.08      | 11.19       |       | -1.19     | 1637.34 |         |
|           |       | 106.25        |           |             | .89   |           |         | 60.71   |
| 3         |       | .00           |           |             | .35   |           |         | 41.92   |
|           |       | .00           | -.04      | 10.33       |       | -.65      | 963.79  |         |
|           |       | 106.25        | -.04      | 5.91        |       | -.65      | 894.87  |         |
|           |       | 106.25        |           |             | .35   |           |         | 41.92   |
| 128       | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | -.14  |           |         | 84.17   |
|           |       | .00           | -.46      | 25.56       |       | -12.99    | 956.18  |         |
|           |       | 106.25        | -.46      | -22.97      |       | -12.99    | -423.63 |         |
|           |       | 106.25        |           |             | -.14  |           |         | 84.17   |
| 2         |       | .00           |           |             | .09   |           |         | 312.29  |
|           |       | .00           | -1.48     | 83.44       |       | -8.41     | 663.42  |         |
|           |       | 106.25        | -1.48     | -73.89      |       | -8.41     | -230.22 |         |
|           |       | 106.25        |           |             | .09   |           |         | 312.29  |
| 3         |       | .00           |           |             | -.07  |           |         | 200.80  |
|           |       | .00           | -.75      | 41.72       |       | -4.36     | 333.37  |         |
|           |       | 106.25        | -.75      | -38.10      |       | -4.36     | -130.19 |         |
|           |       | 106.25        |           |             | -.07  |           |         | 200.80  |
| 129       | ----- |               |           |             |       |           |         |         |
| 1         |       | .00           |           |             | .06   |           |         | -78.53  |
|           |       | .00           | .19       | -8.97       |       | 6.47      | -148.10 |         |
|           |       | 106.25        | .19       | 11.02       |       | 6.47      | 538.94  |         |
|           |       | 106.25        |           |             | .06   |           |         | -78.53  |
| 2         |       | .00           |           |             | .59   |           |         | -250.46 |
|           |       | .00           | .72       | -33.87      |       | .47       | 180.07  |         |
|           |       | 106.25        | .72       | 42.60       |       | .47       | 230.17  |         |
|           |       | 106.25        |           |             | .59   |           |         | -250.46 |
| 3         |       | .00           |           |             | .26   |           |         | -160.71 |
|           |       | .00           | .39       | -18.16      |       | -.22      | 122.12  |         |
|           |       | 106.25        | .39       | 23.39       |       | -.22      | 98.58   |         |
|           |       | 106.25        |           |             | .26   |           |         | -160.71 |

F R A M E E L E M E N T F O R C E S

| ELT LOAD | DIST   | 1-2 PLANE |        | AXIAL | 1-3 PLANE |         | AXIAL  |
|----------|--------|-----------|--------|-------|-----------|---------|--------|
| ID COND  | ENDI   | SHEAR     | MOMENT | FORCE | SHEAR     | MOMENT  | TORQ   |
| 132      | -----  |           |        |       |           |         |        |
| 1        | .00    |           |        | .36   |           |         | -15.57 |
|          | .00    | .01       | 3.76   |       | .99       | 1534.58 |        |
|          | 106.25 | .01       | 4.77   |       | .99       | 1639.43 |        |
|          | 106.25 |           |        | .36   |           |         | -15.57 |
| 2        | .00    |           |        | 1.65  |           |         | -54.93 |
|          | .00    | .03       | 13.30  |       | .24       | 975.85  |        |
|          | 106.25 | .03       | 16.79  |       | .24       | 1001.84 |        |
|          | 106.25 |           |        | 1.65  |           |         | -54.93 |
| 3        | .00    |           |        | .79   |           |         | -37.03 |
|          | .00    | .01       | 6.98   |       | .07       | 520.83  |        |
|          | 106.25 | .01       | 8.56   |       | .07       | 528.60  |        |
|          | 106.25 |           |        | .79   |           |         | -37.03 |
| 133      | -----  |           |        |       |           |         |        |
| 1        | .00    |           |        | .36   |           |         | 15.57  |
|          | .00    | -.01      | 4.77   |       | -.99      | 1639.43 |        |
|          | 106.25 | -.01      | 3.76   |       | -.99      | 1534.58 |        |
|          | 106.25 |           |        | .36   |           |         | 15.57  |
| 2        | .00    |           |        | 1.65  |           |         | 54.93  |
|          | .00    | -.03      | 16.79  |       | -.24      | 1001.84 |        |
|          | 106.25 | -.03      | 13.30  |       | -.24      | 975.85  |        |
|          | 106.25 |           |        | 1.65  |           |         | 54.93  |
| 3        | .00    |           |        | .79   |           |         | 37.03  |
|          | .00    | -.01      | 8.56   |       | -.07      | 528.60  |        |
|          | 106.25 | -.01      | 6.98   |       | -.07      | 520.83  |        |
|          | 106.25 |           |        | .79   |           |         | 37.03  |
| 136      | -----  |           |        |       |           |         |        |
| 1        | .00    |           |        | .06   |           |         | 78.53  |
|          | .00    | -.19      | 11.02  |       | -6.47     | 538.94  |        |
|          | 106.25 | -.19      | -8.97  |       | -6.47     | -148.10 |        |
|          | 106.25 |           |        | .06   |           |         | 78.53  |
| 2        | .00    |           |        | .59   |           |         | 250.46 |
|          | .00    | -.72      | 42.60  |       | -.47      | 230.17  |        |
|          | 106.25 | -.72      | -33.87 |       | -.47      | 180.07  |        |
|          | 106.25 |           |        | .59   |           |         | 250.46 |
| 3        | .00    |           |        | .26   |           |         | 160.71 |
|          | .00    | -.39      | 23.39  |       | .22       | 98.58   |        |
|          | 106.25 | -.39      | -18.16 |       | .22       | 122.12  |        |
|          | 106.25 |           |        | .26   |           |         | 160.71 |

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J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)    | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|---------|----------|----------|----------|---------|----------|
| 1     | .002877 | -.000046 | -.104494 | -.000270 | .000010 | .000000  |
| 2     | .002827 | -.000043 | -.132887 | -.000257 | .000014 | .000000  |
| 3     | .002786 | -.000033 | -.157338 | -.000198 | .000018 | .000000  |
| 4     | .002762 | -.000017 | -.173706 | -.000107 | .000021 | .000000  |
| 5     | .002754 | .000000  | -.179448 | .000000  | .000022 | .000000  |
| 6     | .002762 | .000017  | -.173706 | .000107  | .000021 | -.000000 |
| 7     | .002786 | .000033  | -.157338 | .000198  | .000018 | -.000000 |
| 8     | .002827 | .000043  | -.132887 | .000257  | .000014 | -.000000 |
| 9     | .002877 | .000046  | -.104494 | .000270  | .000010 | -.000000 |
| 10    | .002878 | .000006  | -.106086 | -.000275 | .000011 | .000000  |
| 11    | .002822 | .000000  | -.135249 | -.000264 | .000016 | .000000  |
| 12    | .002782 | -.000001 | -.160382 | -.000203 | .000019 | .000000  |
| 13    | .002759 | -.000001 | -.177190 | -.000110 | .000022 | .000000  |
| 14    | .002752 | .000000  | -.183083 | .000000  | .000023 | .000000  |
| 15    | .002759 | .000001  | -.177190 | .000110  | .000022 | -.000000 |
| 16    | .002782 | .000001  | -.160382 | .000203  | .000019 | -.000000 |
| 17    | .002822 | .000000  | -.135249 | .000264  | .000016 | -.000000 |
| 18    | .002878 | -.000006 | -.106086 | .000275  | .000011 | -.000000 |
| 19    | .002855 | .000026  | -.107038 | -.000280 | .000012 | .000000  |
| 20    | .002811 | .000020  | -.136481 | -.000266 | .000016 | .000000  |
| 21    | .002777 | .000013  | -.161906 | -.000205 | .000020 | .000000  |
| 22    | .002757 | .000006  | -.178929 | -.000111 | .000022 | .000000  |
| 23    | .002750 | .000000  | -.184897 | .000000  | .000023 | .000000  |
| 24    | .002757 | -.000006 | -.178929 | .000111  | .000022 | .000000  |
| 25    | .002777 | -.000013 | -.161906 | .000205  | .000020 | -.000000 |
| 26    | .002811 | -.000020 | -.136481 | .000266  | .000016 | -.000000 |
| 27    | .002855 | -.000026 | -.107038 | .000280  | .000012 | -.000000 |
| 28    | .002838 | .000039  | -.107748 | -.000281 | .000008 | .000000  |
| 29    | .002799 | .000031  | -.137615 | -.000270 | .000014 | .000000  |
| 30    | .002770 | .000021  | -.163392 | -.000208 | .000018 | .000000  |
| 31    | .002753 | .000011  | -.180628 | -.000112 | .000021 | .000000  |
| 32    | .002747 | .000000  | -.186668 | .000000  | .000022 | .000000  |
| 33    | .002753 | -.000011 | -.180628 | .000112  | .000021 | .000000  |
| 34    | .002770 | -.000021 | -.163392 | .000208  | .000018 | -.000000 |
| 35    | .002799 | -.000031 | -.137615 | .000270  | .000014 | -.000000 |
| 36    | .002838 | -.000039 | -.107748 | .000281  | .000008 | -.000000 |
| 37    | .002826 | .000050  | -.108431 | -.000284 | .000010 | .000000  |
| 38    | .002785 | .000039  | -.138671 | -.000274 | .000013 | .000000  |
| 39    | .002761 | .000027  | -.164750 | -.000210 | .000016 | .000000  |
| 40    | .002747 | .000014  | -.182179 | -.000114 | .000019 | .000000  |
| 41    | .002743 | .000000  | -.188286 | .000000  | .000019 | .000000  |
| 42    | .002747 | -.000014 | -.182179 | .000114  | .000019 | .000000  |
| 43    | .002761 | -.000027 | -.164750 | .000210  | .000016 | .000000  |
| 44    | .002785 | -.000039 | -.138671 | .000274  | .000013 | -.000000 |
| 45    | .002826 | -.000050 | -.108431 | .000284  | .000010 | -.000000 |
| 46    | .002790 | .000053  | -.109209 | -.000289 | .000008 | .000000  |
| 47    | .002768 | .000044  | -.139620 | -.000275 | .000011 | .000000  |
| 48    | .002751 | .000030  | -.165904 | -.000212 | .000013 | .000000  |
| 49    | .002740 | .000015  | -.183494 | -.000115 | .000015 | .000000  |
| 50    | .002737 | .000000  | -.189657 | .000000  | .000016 | .000000  |
| 51    | .002740 | -.000015 | -.183494 | .000115  | .000015 | .000000  |
| 52    | .002751 | -.000030 | -.165904 | .000212  | .000013 | .000000  |
| 53    | .002768 | -.000044 | -.139620 | .000275  | .000011 | .000000  |
| 54    | .002790 | -.000053 | -.109209 | .000289  | .000008 | .000000  |
| 55    | .002759 | .000057  | -.109658 | -.000288 | .000005 | .000000  |
| 56    | .002750 | .000045  | -.140329 | -.000278 | .000008 | .000000  |
| 57    | .002739 | .000032  | -.166814 | -.000214 | .000010 | .000000  |
| 58    | .002732 | .000016  | -.184522 | -.000115 | .000011 | .000000  |
| 59    | .002730 | .000000  | -.190727 | .000000  | .000012 | .000000  |
| 60    | .002732 | -.000016 | -.184522 | .000115  | .000011 | .000000  |
| 61    | .002739 | -.000032 | -.166814 | .000214  | .000010 | .000000  |
| 62    | .002750 | -.000045 | -.140329 | .000278  | .000008 | .000000  |
| 63    | .002759 | -.000057 | -.109658 | .000288  | .000005 | .000000  |
| 64    | .002741 | .000057  | -.110095 | -.000290 | .000006 | .000000  |
| 65    | .002732 | .000046  | -.140891 | -.000279 | .000007 | .000000  |
| 66    | .002727 | .000033  | -.167485 | -.000214 | .000007 | .000000  |
| 67    | .002724 | .000017  | -.185268 | -.000116 | .000008 | .000000  |
| 68    | .002723 | .000000  | -.191500 | .000000  | .000008 | .000000  |
| 69    | .002724 | -.000017 | -.185268 | .000116  | .000008 | .000000  |
| 70    | .002727 | -.000033 | -.167485 | .000214  | .000007 | .000000  |
| 71    | .002732 | -.000046 | -.140891 | .000279  | .000007 | .000000  |
| 72    | .002741 | -.000057 | -.110095 | .000290  | .000006 | .000000  |
| 73    | .002709 | .000054  | -.110573 | -.000292 | .000004 | .000000  |
| 74    | .002712 | .000046  | -.141339 | -.000278 | .000004 | .000000  |
| 75    | .002714 | .000032  | -.167946 | -.000215 | .000005 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)    | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|---------|----------|----------|----------|----------|----------|
| 76    | .002715 | .000017  | -.185760 | -.000116 | .000005  | .000000  |
| 77    | .002715 | .000000  | -.192004 | .000000  | .000005  | .000000  |
| 78    | .002715 | -.000017 | -.185760 | .000116  | .000005  | .000000  |
| 79    | .002714 | -.000032 | -.167946 | .000215  | .000005  | .000000  |
| 80    | .002712 | -.000046 | -.141339 | .000278  | .000004  | .000000  |
| 81    | .002709 | -.000054 | -.110573 | .000292  | .000004  | .000000  |
| 82    | .002677 | .000055  | -.110745 | -.000290 | .000002  | .000000  |
| 83    | .002693 | .000045  | -.141585 | -.000279 | .000002  | .000000  |
| 84    | .002701 | .000032  | -.168211 | -.000215 | .000002  | .000000  |
| 85    | .002706 | .000016  | -.186013 | -.000116 | .000002  | .000000  |
| 86    | .002708 | .000000  | -.192252 | .000000  | .000002  | .000000  |
| 87    | .002706 | -.000016 | -.186013 | .000116  | .000002  | .000000  |
| 88    | .002701 | -.000032 | -.168211 | .000215  | .000002  | .000000  |
| 89    | .002693 | -.000045 | -.141585 | .000279  | .000002  | .000000  |
| 90    | .002677 | -.000055 | -.110745 | .000290  | .000002  | .000000  |
| 91    | .002661 | .000054  | -.110984 | -.000289 | .000004  | .000000  |
| 92    | .002676 | .000043  | -.141725 | -.000278 | .000001  | .000000  |
| 93    | .002690 | .000030  | -.168270 | -.000214 | -.000001 | .000000  |
| 94    | .002698 | .000016  | -.186016 | -.000116 | -.000002 | .000000  |
| 95    | .002700 | .000000  | -.192235 | .000000  | -.000002 | .000000  |
| 96    | .002698 | -.000016 | -.186016 | .000116  | -.000002 | .000000  |
| 97    | .002690 | -.000030 | -.168270 | .000214  | -.000001 | .000000  |
| 98    | .002676 | -.000043 | -.141725 | .000278  | .000001  | .000000  |
| 99    | .002661 | -.000054 | -.110984 | .000289  | .000004  | .000000  |
| 100   | .002633 | .000049  | -.111212 | -.000290 | .000000  | .000000  |
| 101   | .002659 | .000040  | -.141726 | -.000276 | -.000002 | .000000  |
| 102   | .002679 | .000028  | -.168097 | -.000213 | -.000004 | .000000  |
| 103   | .002690 | .000014  | -.185742 | -.000115 | -.000005 | .000000  |
| 104   | .002694 | .000000  | -.191925 | .000000  | -.000006 | .000000  |
| 105   | .002690 | -.000014 | -.185742 | .000115  | -.000005 | .000000  |
| 106   | .002679 | -.000028 | -.168097 | .000213  | -.000004 | .000000  |
| 107   | .002659 | -.000040 | -.141726 | .000276  | -.000002 | .000000  |
| 108   | .002633 | -.000049 | -.111212 | .000290  | .000000  | .000000  |
| 109   | .002599 | .000044  | -.111116 | -.000286 | -.000001 | -.000000 |
| 110   | .002643 | .000034  | -.141494 | -.000275 | -.000004 | -.000000 |
| 111   | .002669 | .000024  | -.167685 | -.000211 | -.000007 | .000000  |
| 112   | .002684 | .000012  | -.185186 | -.000114 | -.000009 | .000000  |
| 113   | .002689 | .000000  | -.191318 | .000000  | -.000010 | .000000  |
| 114   | .002684 | -.000012 | -.185186 | .000114  | -.000009 | .000000  |
| 115   | .002669 | -.000024 | -.167685 | .000211  | -.000007 | .000000  |
| 116   | .002643 | -.000034 | -.141494 | .000275  | -.000004 | .000000  |
| 117   | .002599 | -.000044 | -.111116 | .000286  | -.000001 | .000000  |
| 118   | .002590 | .000032  | -.111137 | -.000283 | .000001  | -.000000 |
| 119   | .002631 | .000025  | -.141167 | -.000272 | -.000005 | -.000000 |
| 120   | .002661 | .000017  | -.167076 | -.000209 | -.000009 | -.000000 |
| 121   | .002679 | .000009  | -.184397 | -.000113 | -.000011 | .000000  |
| 122   | .002685 | .000000  | -.190468 | .000000  | -.000012 | .000000  |
| 123   | .002679 | -.000009 | -.184397 | .000113  | -.000011 | .000000  |
| 124   | .002661 | -.000017 | -.167076 | .000209  | -.000009 | .000000  |
| 125   | .002631 | -.000025 | -.141167 | .000272  | -.000005 | .000000  |
| 126   | .002590 | -.000032 | -.111137 | .000283  | .000001  | .000000  |
| 127   | .002576 | .000019  | -.111139 | -.000282 | -.000002 | -.000000 |
| 128   | .002620 | .000014  | -.140764 | -.000268 | -.000006 | -.000000 |
| 129   | .002655 | .000009  | -.166339 | -.000207 | -.000010 | -.000000 |
| 130   | .002675 | .000004  | -.183462 | -.000112 | -.000013 | .000000  |
| 131   | .002682 | .000000  | -.189463 | .000000  | -.000013 | .000000  |
| 132   | .002675 | -.000004 | -.183462 | .000112  | -.000013 | .000000  |
| 133   | .002655 | -.000009 | -.166339 | .000207  | -.000010 | .000000  |
| 134   | .002620 | -.000014 | -.140764 | .000268  | -.000006 | .000000  |
| 135   | .002576 | -.000019 | -.111139 | .000282  | -.000002 | .000000  |
| 136   | .002555 | -.000001 | -.110887 | -.000277 | -.000002 | -.000000 |
| 137   | .002611 | -.000005 | -.140257 | -.000265 | -.000006 | -.000000 |
| 138   | .002651 | -.000005 | -.165558 | -.000204 | -.000010 | -.000000 |
| 139   | .002673 | -.000003 | -.182477 | -.000110 | -.000012 | -.000000 |
| 140   | .002680 | .000000  | -.188409 | .000000  | -.000013 | .000000  |
| 141   | .002673 | .000003  | -.182477 | .000110  | -.000012 | .000000  |
| 142   | .002651 | .000005  | -.165558 | .000204  | -.000010 | .000000  |
| 143   | .002611 | .000005  | -.140257 | .000265  | -.000006 | .000000  |
| 144   | .002555 | .000001  | -.110887 | .000277  | -.000002 | .000000  |
| 145   | .002556 | -.000051 | -.110755 | -.000273 | -.000001 | -.000000 |
| 146   | .002608 | -.000048 | -.139473 | -.000260 | -.000005 | -.000000 |
| 147   | .002648 | -.000035 | -.164209 | -.000200 | -.000009 | -.000000 |
| 148   | .002672 | -.000019 | -.180768 | -.000108 | -.000011 | -.000000 |
| 149   | .002679 | .000000  | -.186576 | .000000  | -.000012 | .000000  |
| 150   | .002672 | .000019  | -.180768 | .000108  | -.000011 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - D I S P L A C E M E N T S "U" A N D R O T A T I O N S "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|----------|----------|----------|----------|----------|----------|
| 151   | .002648  | .000035  | -.164209 | .000200  | -.000009 | .000000  |
| 152   | .002608  | .000048  | -.139473 | .000260  | -.000005 | .000000  |
| 153   | .002556  | .000051  | -.110755 | .000273  | -.000001 | .000000  |
| 154   | .000000  | .000000  | -.100410 | .000245  | .000005  | .000000  |
| 155   | .000495  | -.023454 | -.101312 | .000155  | .000004  | -.000000 |
| 156   | .000899  | -.035960 | -.102176 | .000058  | .000004  | -.000001 |
| 157   | .001331  | -.036720 | -.102991 | -.000046 | .000004  | -.000001 |
| 158   | .001945  | -.024954 | -.103758 | -.000156 | .000007  | -.000001 |
| 159   | -.000071 | -.000005 | -.101425 | .000246  | .000006  | -.000000 |
| 160   | .000509  | -.023520 | -.102314 | .000155  | .000004  | -.000000 |
| 161   | .000909  | -.036072 | -.103222 | .000058  | .000003  | -.000001 |
| 162   | .001325  | -.036876 | -.104155 | -.000046 | .000004  | -.000001 |
| 163   | .001913  | -.025142 | -.105113 | -.000156 | .000006  | -.000001 |
| 164   | -.000087 | -.000031 | -.102859 | .000248  | .000009  | -.000000 |
| 165   | .000617  | -.023834 | -.103945 | .000158  | .000004  | .000001  |
| 166   | .001066  | -.036693 | -.104971 | .000061  | .000004  | .000000  |
| 167   | .001485  | -.037659 | -.105943 | -.000045 | .000004  | -.000000 |
| 168   | .002024  | -.025730 | -.106865 | -.000160 | .000006  | -.000001 |
| 169   | -.000059 | -.000047 | -.103547 | .000245  | .000005  | .000000  |
| 170   | .000571  | -.023782 | -.104415 | .000158  | .000005  | .000001  |
| 171   | .001066  | -.036680 | -.105344 | .000061  | .000004  | .000000  |
| 172   | .001487  | -.037684 | -.106327 | -.000045 | .000004  | -.000000 |
| 173   | .002004  | -.025793 | -.107359 | -.000160 | .000005  | -.000001 |
| 174   | -.000044 | -.000055 | -.104702 | .000247  | .000007  | .000000  |
| 175   | .000584  | -.024073 | -.105687 | .000161  | .000004  | -.000002 |
| 176   | .001078  | -.037215 | -.106687 | .000062  | .000004  | -.000001 |
| 177   | .001586  | -.038300 | -.107684 | -.000045 | .000005  | -.000001 |
| 178   | .002142  | -.026235 | -.108674 | -.000162 | .000005  | -.000001 |
| 179   | -.000007 | -.000048 | -.104986 | .000252  | .000004  | .000000  |
| 180   | .000544  | -.024209 | -.106014 | .000161  | .000005  | -.000002 |
| 181   | .001077  | -.037324 | -.107027 | .000062  | .000004  | -.000001 |
| 182   | .001588  | -.038385 | -.108043 | -.000046 | .000004  | -.000001 |
| 183   | .002123  | -.026296 | -.109066 | -.000163 | .000005  | -.000001 |
| 184   | .000012  | -.000047 | -.105604 | .000253  | .000005  | .000000  |
| 185   | .000525  | -.024306 | -.106621 | .000161  | .000004  | .000001  |
| 186   | .001082  | -.037458 | -.107632 | .000062  | .000005  | .000001  |
| 187   | .001680  | -.038499 | -.108655 | -.000046 | .000005  | .000001  |
| 188   | .002242  | -.026356 | -.109694 | -.000163 | .000004  | .000001  |
| 189   | .000056  | -.000051 | -.105980 | .000249  | .000001  | .000000  |
| 190   | .000475  | -.024201 | -.106993 | .000161  | .000005  | .000001  |
| 191   | .001081  | -.037375 | -.108011 | .000062  | .000005  | .000001  |
| 192   | .001682  | -.038435 | -.109016 | -.000046 | .000005  | .000001  |
| 193   | .002221  | -.026311 | -.110007 | -.000163 | .000004  | .000001  |
| 194   | .000065  | -.000037 | -.106164 | .000249  | .000004  | .000000  |
| 195   | .000522  | -.024113 | -.107040 | .000160  | .000004  | -.000001 |
| 196   | .001126  | -.037113 | -.107982 | .000061  | .000006  | -.000000 |
| 197   | .001793  | -.038042 | -.108979 | -.000046 | .000005  | .000000  |
| 198   | .002356  | -.025982 | -.110028 | -.000161 | .000004  | .000001  |
| 199   | .000080  | -.000021 | -.106185 | .000253  | .000001  | .000000  |
| 200   | .000490  | -.024194 | -.107290 | .000160  | .000005  | -.000001 |
| 201   | .001127  | -.037149 | -.108329 | .000061  | .000006  | -.000000 |
| 202   | .001794  | -.038036 | -.109312 | -.000047 | .000005  | .000000  |
| 203   | .002333  | -.025932 | -.110245 | -.000162 | .000003  | .000001  |
| 204   | .000055  | -.000001 | -.106207 | .000251  | .000004  | .000000  |
| 205   | .000623  | -.023993 | -.107091 | .000158  | .000006  | .000000  |
| 206   | .001325  | -.036690 | -.107999 | .000058  | .000006  | .000000  |
| 207   | .001992  | -.037396 | -.108937 | -.000047 | .000005  | .000001  |
| 208   | .002470  | -.025418 | -.109903 | -.000159 | .000003  | .000001  |
| 209   | .000000  | .000000  | -.106669 | .000252  | .000004  | -.000000 |
| 210   | .000617  | -.023976 | -.107595 | .000158  | .000006  | .000000  |
| 211   | .001329  | -.036637 | -.108471 | .000058  | .000006  | .000000  |
| 212   | .001989  | -.037306 | -.109284 | -.000047 | .000005  | .000001  |
| 213   | .002446  | -.025295 | -.110039 | -.000159 | .000002  | .000001  |
| 214   | -.000048 | -.000048 | -.103816 | .000250  | .000008  | -.000000 |
| 215   | .000055  | -.000041 | -.105748 | .000253  | .000001  | .000000  |
| 216   | .000000  | .000000  | -.100410 | -.000245 | .000005  | -.000000 |
| 217   | .000495  | .023454  | -.101312 | -.000155 | .000004  | .000000  |
| 218   | .000899  | .035960  | -.102176 | -.000058 | .000004  | .000001  |
| 219   | .001331  | .036720  | -.102991 | .000046  | .000004  | .000001  |
| 220   | .001945  | .024954  | -.103758 | .000156  | .000007  | .000001  |
| 221   | -.000071 | .000005  | -.101425 | -.000246 | .000006  | .000000  |
| 222   | .000509  | .023520  | -.102314 | -.000155 | .000004  | .000000  |
| 223   | .000909  | .036072  | -.103222 | -.000058 | .000003  | .000001  |
| 224   | .001325  | .036876  | -.104155 | .000046  | .000004  | .000001  |
| 225   | .001913  | .025142  | -.105113 | .000156  | .000006  | .000001  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|----------|----------|----------|----------|---------|----------|
| 226   | -.000087 | .000031  | -.102859 | -.000248 | .000009 | .000000  |
| 227   | .000617  | .023834  | -.103945 | -.000158 | .000004 | -.000001 |
| 228   | .001066  | .036693  | -.104971 | -.000061 | .000004 | -.000000 |
| 229   | .001485  | .037659  | -.105943 | .000045  | .000004 | .000000  |
| 230   | .002024  | .025730  | -.106865 | .000160  | .000006 | .000001  |
| 231   | -.000059 | .000047  | -.103547 | -.000245 | .000005 | .000000  |
| 232   | .000571  | .023782  | -.104415 | -.000158 | .000005 | -.000001 |
| 233   | .001066  | .036680  | -.105344 | -.000061 | .000004 | -.000000 |
| 234   | .001487  | .037684  | -.106327 | .000045  | .000004 | .000000  |
| 235   | .002004  | .025793  | -.107359 | .000160  | .000005 | .000001  |
| 236   | -.000044 | .000055  | -.104702 | -.000247 | .000007 | .000000  |
| 237   | .000584  | .024073  | -.105687 | -.000161 | .000004 | .000002  |
| 238   | .001078  | .037215  | -.106687 | -.000062 | .000004 | .000001  |
| 239   | .001586  | .038300  | -.107684 | .000045  | .000005 | .000001  |
| 240   | .002142  | .026235  | -.108674 | .000162  | .000005 | .000001  |
| 241   | -.000007 | .000048  | -.104986 | -.000252 | .000004 | .000000  |
| 242   | .000544  | .024209  | -.106014 | -.000161 | .000005 | .000002  |
| 243   | .001077  | .037324  | -.107027 | -.000062 | .000004 | .000001  |
| 244   | .001588  | .038385  | -.108043 | .000046  | .000004 | .000001  |
| 245   | .002123  | .026296  | -.109066 | .000163  | .000005 | .000001  |
| 246   | .000012  | .000047  | -.105604 | -.000253 | .000005 | .000000  |
| 247   | .000525  | .024306  | -.106621 | -.000161 | .000004 | -.000001 |
| 248   | .001082  | .037458  | -.107632 | -.000062 | .000005 | -.000001 |
| 249   | .001680  | .038499  | -.108655 | .000046  | .000005 | -.000001 |
| 250   | .002242  | .026356  | -.109694 | .000163  | .000004 | -.000001 |
| 251   | .000056  | .000051  | -.105980 | -.000249 | .000001 | .000000  |
| 252   | .000475  | .024201  | -.106993 | -.000161 | .000005 | -.000001 |
| 253   | .001081  | .037375  | -.108011 | -.000062 | .000005 | -.000001 |
| 254   | .001682  | .038435  | -.109016 | .000046  | .000005 | -.000001 |
| 255   | .002221  | .026311  | -.110007 | .000163  | .000004 | -.000001 |
| 256   | .000065  | .000037  | -.106164 | -.000249 | .000004 | .000000  |
| 257   | .000522  | .024113  | -.107040 | -.000160 | .000004 | .000001  |
| 258   | .001126  | .037113  | -.107982 | -.000061 | .000006 | .000000  |
| 259   | .001793  | .038042  | -.108979 | .000046  | .000005 | .000000  |
| 260   | .002356  | .025982  | -.110028 | .000161  | .000004 | -.000001 |
| 261   | .000080  | .000021  | -.106185 | -.000253 | .000001 | -.000000 |
| 262   | .000490  | .024194  | -.107290 | -.000160 | .000005 | .000001  |
| 263   | .001127  | .037149  | -.108329 | -.000061 | .000006 | .000000  |
| 264   | .001794  | .038036  | -.109312 | .000047  | .000005 | .000000  |
| 265   | .002333  | .025932  | -.110245 | .000162  | .000003 | -.000001 |
| 266   | .000055  | .000001  | -.106207 | -.000251 | .000004 | -.000000 |
| 267   | .000623  | .023993  | -.107091 | -.000158 | .000006 | -.000000 |
| 268   | .001325  | .036690  | -.107999 | -.000058 | .000006 | -.000000 |
| 269   | .001992  | .037396  | -.108937 | .000047  | .000005 | -.000001 |
| 270   | .002470  | .025418  | -.109903 | .000159  | .000003 | -.000001 |
| 271   | .000000  | .000000  | -.106669 | -.000252 | .000004 | .000000  |
| 272   | .000617  | .023976  | -.107595 | -.000158 | .000006 | -.000000 |
| 273   | .001329  | .036637  | -.108471 | -.000058 | .000006 | -.000000 |
| 274   | .001989  | .037306  | -.109284 | .000047  | .000005 | -.000001 |
| 275   | .002446  | .025295  | -.110039 | .000159  | .000002 | -.000001 |
| 276   | -.000048 | .000048  | -.103816 | -.000250 | .000008 | .000000  |
| 277   | .000055  | .000041  | -.105748 | -.000253 | .000001 | -.000000 |
| 278   | -.000025 | .000002  | -.074692 | .000230  | .000005 | .000000  |
| 279   | -.000027 | .000004  | -.053003 | .000173  | .000005 | .000000  |
| 280   | -.000021 | .000003  | -.038804 | .000092  | .000005 | .000000  |
| 281   | -.000017 | .000000  | -.033887 | .000000  | .000005 | .000000  |
| 282   | -.000021 | -.000003 | -.038804 | -.000092 | .000005 | .000000  |
| 283   | -.000027 | -.000004 | -.053003 | -.000173 | .000005 | .000000  |
| 284   | -.000025 | -.000002 | -.074692 | -.000230 | .000005 | -.000000 |
| 285   | -.000043 | -.000001 | -.075613 | .000231  | .000007 | -.000000 |
| 286   | -.000026 | -.000001 | -.053860 | .000174  | .000006 | -.000000 |
| 287   | -.000018 | -.000001 | -.039603 | .000092  | .000005 | .000000  |
| 288   | -.000015 | .000000  | -.034664 | .000000  | .000005 | .000000  |
| 289   | -.000018 | .000001  | -.039603 | -.000092 | .000005 | .000000  |
| 290   | -.000026 | .000001  | -.053860 | -.000174 | .000006 | .000000  |
| 291   | -.000043 | .000001  | -.075613 | -.000231 | .000007 | .000000  |
| 292   | -.000047 | -.000021 | -.076694 | .000233  | .000007 | -.000000 |
| 293   | -.000024 | -.000014 | -.054716 | .000175  | .000005 | -.000000 |
| 294   | -.000014 | -.000007 | -.040348 | .000093  | .000005 | .000000  |
| 295   | -.000011 | .000000  | -.035375 | .000000  | .000004 | .000000  |
| 296   | -.000014 | .000007  | -.040348 | -.000093 | .000005 | .000000  |
| 297   | -.000024 | .000014  | -.054716 | -.000175 | .000005 | .000000  |
| 298   | -.000047 | .000021  | -.076694 | -.000233 | .000007 | .000000  |
| 299   | -.000031 | -.000036 | -.077573 | .000234  | .000006 | -.000000 |
| 300   | -.000017 | -.000024 | -.055490 | .000176  | .000005 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|----------|----------|----------|----------|---------|----------|
| 301   | -.000010 | -.000012 | -.041008 | .000094  | .000004 | .000000  |
| 302   | -.000007 | .000000  | -.035991 | .000000  | .000004 | .000000  |
| 303   | -.000010 | .000012  | -.041008 | -.000094 | .000004 | .000000  |
| 304   | -.000017 | .000024  | -.055490 | -.000176 | .000005 | .000000  |
| 305   | -.000031 | .000036  | -.077573 | -.000234 | .000006 | .000000  |
| 306   | -.000008 | -.000038 | -.078457 | .000237  | .000005 | .000000  |
| 307   | -.000006 | -.000027 | -.056130 | .000178  | .000004 | .000000  |
| 308   | -.000004 | -.000014 | -.041525 | .000094  | .000003 | .000000  |
| 309   | -.000003 | .000000  | -.036470 | .000000  | .000003 | .000000  |
| 310   | -.000004 | .000014  | -.041525 | -.000094 | .000003 | .000000  |
| 311   | -.000006 | .000027  | -.056130 | -.000178 | .000004 | .000000  |
| 312   | -.000008 | .000038  | -.078457 | -.000237 | .000005 | .000000  |
| 313   | .000011  | -.000037 | -.078984 | .000238  | .000003 | .000000  |
| 314   | .000007  | -.000026 | -.056566 | .000179  | .000002 | .000000  |
| 315   | .000003  | -.000013 | -.041896 | .000095  | .000002 | .000000  |
| 316   | .000002  | .000000  | -.036817 | .000000  | .000002 | .000000  |
| 317   | .000003  | .000013  | -.041896 | -.000095 | .000002 | .000000  |
| 318   | .000007  | .000026  | -.056566 | -.000179 | .000002 | .000000  |
| 319   | .000011  | .000037  | -.078984 | -.000238 | .000003 | .000000  |
| 320   | .000032  | -.000033 | -.079211 | .000237  | .000002 | .000000  |
| 321   | .000017  | -.000022 | -.056838 | .000179  | .000002 | .000000  |
| 322   | .000009  | -.000011 | -.042163 | .000095  | .000002 | .000000  |
| 323   | .000007  | .000000  | -.037079 | .000000  | .000002 | .000000  |
| 324   | .000009  | .000011  | -.042163 | -.000095 | .000002 | .000000  |
| 325   | .000017  | .000022  | -.056838 | -.000179 | .000002 | .000000  |
| 326   | .000032  | .000033  | -.079211 | -.000237 | .000002 | -.000000 |
| 327   | .000044  | -.000017 | -.079534 | .000238  | .000002 | .000000  |
| 328   | .000022  | -.000011 | -.057095 | .000179  | .000002 | .000000  |
| 329   | .000013  | -.000006 | -.042414 | .000095  | .000002 | .000000  |
| 330   | .000010  | .000000  | -.037331 | .000000  | .000002 | .000000  |
| 331   | .000013  | .000006  | -.042414 | -.000095 | .000002 | .000000  |
| 332   | .000022  | .000011  | -.057095 | -.000179 | .000002 | -.000000 |
| 333   | .000044  | .000017  | -.079534 | -.000238 | .000002 | -.000000 |
| 334   | .000037  | .000000  | -.079774 | .000237  | .000003 | .000000  |
| 335   | .000024  | .000000  | -.057425 | .000179  | .000002 | .000000  |
| 336   | .000017  | -.000000 | -.042743 | .000095  | .000002 | .000000  |
| 337   | .000014  | .000000  | -.037653 | .000000  | .000002 | .000000  |
| 338   | .000017  | .000000  | -.042743 | -.000095 | .000002 | .000000  |
| 339   | .000024  | .000000  | -.057425 | -.000179 | .000002 | .000000  |
| 340   | .000037  | -.000000 | -.079774 | -.000237 | .000003 | -.000000 |
| 341   | .000023  | .000002  | -.080223 | .000237  | .000003 | -.000000 |
| 342   | .000025  | .000003  | -.057830 | .000179  | .000003 | .000000  |
| 343   | .000019  | .000003  | -.043128 | .000095  | .000003 | .000000  |
| 344   | .000016  | .000000  | -.038031 | .000000  | .000003 | .000000  |
| 345   | .000019  | -.000003 | -.043128 | -.000095 | .000003 | .000000  |
| 346   | .000025  | -.000003 | -.057830 | -.000179 | .000003 | .000000  |
| 347   | .000023  | -.000002 | -.080223 | -.000237 | .000003 | .000000  |

C S I / S A P 9 0 - - FINITE ELEMENT ANALYSIS OF STRUCTURES PAGE 6  
E133 (513+360) TRAMO Va PROGRAM:SAP90/FILE:pi513.SOL  
J O I N T D I S P L A C E M E N T S  
LOAD CONDITION 2 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)    | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|---------|----------|----------|----------|---------|----------|
| 1     | .003920 | -.000235 | -.072289 | -.000168 | .000020 | .000002  |
| 2     | .003743 | -.000208 | -.089478 | -.000155 | .000033 | .000001  |
| 3     | .003602 | -.000151 | -.104062 | -.000119 | .000046 | .000001  |
| 4     | .003519 | -.000079 | -.113843 | -.000064 | .000055 | .000000  |
| 5     | .003492 | .000000  | -.117283 | .000000  | .000058 | .000000  |
| 6     | .003519 | .000079  | -.113843 | .000064  | .000055 | -.000000 |
| 7     | .003602 | .000151  | -.104062 | .000119  | .000046 | -.000001 |
| 8     | .003743 | .000208  | -.089478 | .000155  | .000033 | -.000001 |
| 9     | .003920 | .000235  | -.072289 | .000168  | .000020 | -.000002 |
| 10    | .003905 | -.000060 | -.075573 | -.000186 | .000022 | .000001  |
| 11    | .003723 | -.000060 | -.095203 | -.000177 | .000039 | .000001  |
| 12    | .003589 | -.000045 | -.112059 | -.000136 | .000053 | .000001  |
| 13    | .003512 | -.000024 | -.123343 | -.000074 | .000062 | .000000  |
| 14    | .003487 | .000000  | -.127304 | .000000  | .000066 | .000000  |
| 15    | .003512 | .000024  | -.123343 | .000074  | .000062 | -.000000 |
| 16    | .003589 | .000045  | -.112059 | .000136  | .000053 | -.000001 |
| 17    | .003723 | .000060  | -.095203 | .000177  | .000039 | -.000001 |
| 18    | .003905 | .000060  | -.075573 | .000186  | .000022 | -.000001 |
| 19    | .003844 | .000010  | -.077657 | -.000198 | .000030 | .000001  |
| 20    | .003690 | .000007  | -.098425 | -.000188 | .000043 | .000001  |
| 21    | .003571 | .000003  | -.116380 | -.000145 | .000058 | .000001  |
| 22    | .003502 | .000001  | -.128422 | -.000079 | .000068 | .000000  |
| 23    | .003480 | .000000  | -.132647 | .000000  | .000071 | .000000  |
| 24    | .003502 | -.000001 | -.128422 | .000079  | .000068 | -.000000 |
| 25    | .003571 | -.000003 | -.116380 | .000145  | .000058 | -.000001 |
| 26    | .003690 | -.000007 | -.098425 | .000188  | .000043 | -.000001 |
| 27    | .003844 | -.000010 | -.077657 | .000198  | .000030 | -.000001 |
| 28    | .003807 | .000050  | -.079743 | -.000208 | .000024 | .000001  |
| 29    | .003651 | .000044  | -.101828 | -.000200 | .000043 | .000001  |
| 30    | .003547 | .000032  | -.120961 | -.000154 | .000059 | .000000  |
| 31    | .003488 | .000016  | -.133764 | -.000083 | .000068 | .000000  |
| 32    | .003468 | .000000  | -.138249 | .000000  | .000072 | .000000  |
| 33    | .003488 | -.000016 | -.133764 | .000083  | .000068 | -.000000 |
| 34    | .003547 | -.000032 | -.120961 | .000154  | .000059 | -.000000 |
| 35    | .003651 | -.000044 | -.101828 | .000200  | .000043 | -.000001 |
| 36    | .003807 | -.000050 | -.079743 | .000208  | .000024 | -.000001 |
| 37    | .003736 | .000089  | -.081558 | -.000220 | .000023 | .000001  |
| 38    | .003603 | .000073  | -.105082 | -.000213 | .000039 | .000000  |
| 39    | .003517 | .000051  | -.125338 | -.000163 | .000052 | .000000  |
| 40    | .003469 | .000027  | -.138835 | -.000088 | .000060 | .000000  |
| 41    | .003453 | .000000  | -.143558 | .000000  | .000063 | .000000  |
| 42    | .003469 | -.000027 | -.138835 | .000088  | .000060 | -.000000 |
| 43    | .003517 | -.000051 | -.125338 | .000163  | .000052 | -.000000 |
| 44    | .003603 | -.000073 | -.105082 | .000213  | .000039 | -.000000 |
| 45    | .003736 | -.000089 | -.081558 | .000220  | .000023 | -.000001 |
| 46    | .003627 | .000105  | -.083318 | -.000230 | .000019 | .000000  |
| 47    | .003545 | .000090  | -.107704 | -.000221 | .000027 | .000000  |
| 48    | .003482 | .000064  | -.128774 | -.000170 | .000035 | .000000  |
| 49    | .003445 | .000033  | -.142827 | -.000091 | .000041 | .000000  |
| 50    | .003433 | .000000  | -.147741 | .000000  | .000043 | .000000  |
| 51    | .003445 | -.000033 | -.142827 | .000091  | .000041 | -.000000 |
| 52    | .003482 | -.000064 | -.128774 | .000170  | .000035 | -.000000 |
| 53    | .003545 | -.000090 | -.107704 | .000221  | .000027 | -.000000 |
| 54    | .003627 | -.000105 | -.083318 | .000230  | .000019 | -.000000 |
| 55    | .003535 | .000116  | -.084291 | -.000233 | .000008 | .000000  |
| 56    | .003482 | .000099  | -.109231 | -.000226 | .000013 | .000000  |
| 57    | .003442 | .000071  | -.130831 | -.000174 | .000018 | .000000  |
| 58    | .003418 | .000037  | -.145258 | -.000094 | .000022 | .000000  |
| 59    | .003410 | .000000  | -.150309 | .000000  | .000023 | .000000  |
| 60    | .003418 | -.000037 | -.145258 | .000094  | .000022 | .000000  |
| 61    | .003442 | -.000071 | -.130831 | .000174  | .000018 | -.000000 |
| 62    | .003482 | -.000099 | -.109231 | .000226  | .000013 | -.000000 |
| 63    | .003535 | -.000116 | -.084291 | .000233  | .000008 | -.000000 |
| 64    | .003441 | .000120  | -.084804 | -.000236 | .000006 | .000000  |
| 65    | .003417 | .000103  | -.109987 | -.000229 | .000007 | .000000  |
| 66    | .003399 | .000075  | -.131843 | -.000176 | .000009 | .000000  |
| 67    | .003388 | .000039  | -.146480 | -.000095 | .000011 | .000000  |
| 68    | .003384 | .000000  | -.151611 | .000000  | .000012 | .000000  |
| 69    | .003388 | -.000039 | -.146480 | .000095  | .000011 | .000000  |
| 70    | .003399 | -.000075 | -.131843 | .000176  | .000009 | .000000  |
| 71    | .003417 | -.000103 | -.109987 | .000229  | .000007 | .000000  |
| 72    | .003441 | -.000120 | -.084804 | .000236  | .000006 | .000000  |
| 73    | .003346 | .000117  | -.085298 | -.000239 | .000005 | .000000  |
| 74    | .003351 | .000103  | -.110492 | -.000229 | .000006 | .000000  |
| 75    | .003354 | .000075  | -.132411 | -.000177 | .000006 | .000000  |

C S I / S A P 9 0 - - FINITE ELEMENT ANALYSIS OF STRUCTURES PAGE 7  
E133 (513+360) TRAMO Va PROGRAM:SAP90/FILE:pi513.SOL  
J O I N T D I S P L A C E M E N T S  
LOAD CONDITION 2 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)    | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|---------|----------|----------|----------|----------|----------|
| 76    | .003356 | .000040  | -.147127 | -.000096 | .000006  | .000000  |
| 77    | .003357 | .000000  | -.152287 | .000000  | .000006  | .000000  |
| 78    | .003356 | -.000040 | -.147127 | .000096  | .000006  | .000000  |
| 79    | .003354 | -.000075 | -.132411 | .000177  | .000006  | .000000  |
| 80    | .003351 | -.000103 | -.110492 | .000229  | .000006  | .000000  |
| 81    | .003346 | -.000117 | -.085298 | .000239  | .000005  | .000000  |
| 82    | .003249 | .000118  | -.085598 | -.000236 | .000004  | .000000  |
| 83    | .003284 | .000101  | -.110861 | -.000229 | .000004  | -.000000 |
| 84    | .003310 | .000074  | -.132778 | -.000177 | .000003  | .000000  |
| 85    | .003325 | .000039  | -.147454 | -.000096 | .000002  | .000000  |
| 86    | .003330 | .000000  | -.152598 | .000000  | .000001  | .000000  |
| 87    | .003325 | -.000039 | -.147454 | .000096  | .000002  | .000000  |
| 88    | .003310 | -.000074 | -.132778 | .000177  | .000003  | .000000  |
| 89    | .003284 | -.000101 | -.110861 | .000229  | .000004  | .000000  |
| 90    | .003249 | -.000118 | -.085598 | .000236  | .000004  | .000000  |
| 91    | .003158 | .000112  | -.085913 | -.000234 | .000003  | -.000000 |
| 92    | .003221 | .000096  | -.110988 | -.000227 | -.000002 | -.000000 |
| 93    | .003268 | .000069  | -.132705 | -.000175 | -.000006 | -.000000 |
| 94    | .003296 | .000036  | -.147209 | -.000094 | -.000010 | .000000  |
| 95    | .003305 | .000000  | -.152286 | .000000  | -.000011 | .000000  |
| 96    | .003296 | -.000036 | -.147209 | .000094  | -.000010 | .000000  |
| 97    | .003268 | -.000069 | -.132705 | .000175  | -.000006 | .000000  |
| 98    | .003221 | -.000096 | -.110988 | .000227  | -.000002 | .000000  |
| 99    | .003158 | -.000112 | -.085913 | .000234  | .000003  | .000000  |
| 100   | .003070 | .000099  | -.085761 | -.000232 | -.000009 | -.000000 |
| 101   | .003160 | .000085  | -.110351 | -.000222 | -.000016 | -.000000 |
| 102   | .003229 | .000061  | -.131593 | -.000171 | -.000023 | -.000000 |
| 103   | .003270 | .000031  | -.145758 | -.000092 | -.000029 | -.000000 |
| 104   | .003283 | .000000  | -.150712 | .000000  | -.000031 | .000000  |
| 105   | .003270 | -.000031 | -.145758 | .000092  | -.000029 | .000000  |
| 106   | .003229 | -.000061 | -.131593 | .000171  | -.000023 | .000000  |
| 107   | .003160 | -.000085 | -.110351 | .000222  | -.000016 | .000000  |
| 108   | .003070 | -.000099 | -.085761 | .000232  | -.000009 | .000000  |
| 109   | .002962 | .000081  | -.084830 | -.000222 | -.000012 | -.000001 |
| 110   | .003104 | .000066  | -.108626 | -.000215 | -.000027 | -.000001 |
| 111   | .003195 | .000047  | -.129107 | -.000165 | -.000039 | -.000000 |
| 112   | .003247 | .000024  | -.142750 | -.000089 | -.000047 | -.000000 |
| 113   | .003264 | .000000  | -.147523 | .000000  | -.000050 | .000000  |
| 114   | .003247 | -.000024 | -.142750 | .000089  | -.000047 | .000000  |
| 115   | .003195 | -.000047 | -.129107 | .000165  | -.000039 | .000000  |
| 116   | .003104 | -.000066 | -.108626 | .000215  | -.000027 | .000001  |
| 117   | .002962 | -.000081 | -.084830 | .000222  | -.000012 | .000001  |
| 118   | .002894 | .000040  | -.083871 | -.000211 | -.000013 | -.000001 |
| 119   | .003057 | .000035  | -.106278 | -.000203 | -.000032 | -.000001 |
| 120   | .003167 | .000025  | -.125680 | -.000157 | -.000047 | -.000000 |
| 121   | .003230 | .000013  | -.138658 | -.000084 | -.000056 | -.000000 |
| 122   | .003250 | .000000  | -.143205 | .000000  | -.000059 | .000000  |
| 123   | .003230 | -.000013 | -.138658 | .000084  | -.000056 | .000000  |
| 124   | .003167 | -.000025 | -.125680 | .000157  | -.000047 | .000000  |
| 125   | .003057 | -.000035 | -.106278 | .000203  | -.000032 | .000001  |
| 126   | .002894 | -.000040 | -.083871 | .000211  | -.000013 | .000001  |
| 127   | .002860 | -.000004 | -.082640 | -.000202 | -.000019 | -.000001 |
| 128   | .003021 | -.000005 | -.103777 | -.000191 | -.000032 | -.000001 |
| 129   | .003145 | -.000006 | -.122038 | -.000148 | -.000046 | -.000001 |
| 130   | .003217 | -.000004 | -.134281 | -.000080 | -.000055 | -.000000 |
| 131   | .003240 | .000000  | -.138576 | .000000  | -.000059 | .000000  |
| 132   | .003217 | .000004  | -.134281 | .000080  | -.000055 | .000000  |
| 133   | .003145 | .000006  | -.122038 | .000148  | -.000046 | .000001  |
| 134   | .003021 | .000005  | -.103777 | .000191  | -.000032 | .000001  |
| 135   | .002860 | .000004  | -.082640 | .000202  | -.000019 | .000001  |
| 136   | .002800 | -.000077 | -.081384 | -.000190 | -.000011 | -.000002 |
| 137   | .002992 | -.000074 | -.101434 | -.000181 | -.000028 | -.000001 |
| 138   | .003130 | -.000056 | -.118627 | -.000139 | -.000041 | -.000001 |
| 139   | .003209 | -.000030 | -.130133 | -.000075 | -.000051 | -.000000 |
| 140   | .003234 | .000000  | -.134173 | .000000  | -.000054 | .000000  |
| 141   | .003209 | .000030  | -.130133 | .000075  | -.000051 | .000000  |
| 142   | .003130 | .000056  | -.118627 | .000139  | -.000041 | .000001  |
| 143   | .002992 | .000074  | -.101434 | .000181  | -.000028 | .000001  |
| 144   | .002800 | .000077  | -.081384 | .000190  | -.000011 | .000002  |
| 145   | .002785 | -.000255 | -.079994 | -.000175 | -.000010 | -.000002 |
| 146   | .002975 | -.000224 | -.097906 | -.000161 | -.000023 | -.000002 |
| 147   | .003120 | -.000163 | -.113132 | -.000124 | -.000036 | -.000001 |
| 148   | .003204 | -.000085 | -.123351 | -.000067 | -.000045 | -.000000 |
| 149   | .003231 | .000000  | -.126946 | .000000  | -.000048 | .000000  |
| 150   | .003204 | .000085  | -.123351 | .000067  | -.000045 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 2 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|----------|----------|----------|----------|----------|----------|
| 151   | .003120  | .000163  | -.113132 | .000124  | -.000036 | .000001  |
| 152   | .002975  | .000224  | -.097906 | .000161  | -.000023 | .000002  |
| 153   | .002785  | .000255  | -.079994 | .000175  | -.000010 | .000002  |
| 154   | .000000  | .000000  | -.070784 | .000175  | .000008  | .000001  |
| 155   | .000678  | -.016460 | -.071341 | .000106  | .000004  | -.000001 |
| 156   | .001020  | -.024771 | -.071785 | .000036  | .000003  | -.000002 |
| 157   | .001383  | -.024807 | -.072081 | -.000035 | .000005  | -.000003 |
| 158   | .002200  | -.016472 | -.072234 | -.000107 | .000011  | -.000004 |
| 159   | -.000200 | .000031  | -.072766 | .000177  | .000012  | -.000001 |
| 160   | .000711  | -.016615 | -.073196 | .000107  | .000005  | -.000001 |
| 161   | .001047  | -.025097 | -.073685 | .000037  | .000002  | -.000002 |
| 162   | .001371  | -.025301 | -.074249 | -.000034 | .000004  | -.000003 |
| 163   | .002137  | -.017095 | -.074886 | -.000107 | .000010  | -.000004 |
| 164   | -.000251 | -.000025 | -.076080 | .000184  | .000016  | -.000001 |
| 165   | .000811  | -.017775 | -.077161 | .000118  | .000005  | -.000001 |
| 166   | .001063  | -.027439 | -.078074 | .000046  | .000001  | -.000002 |
| 167   | .001229  | -.028207 | -.078802 | -.000034 | .000003  | -.000003 |
| 168   | .001912  | -.019248 | -.079347 | -.000120 | .000010  | -.000004 |
| 169   | -.000220 | -.000060 | -.077309 | .000184  | .000012  | -.000000 |
| 170   | .000762  | -.017847 | -.077811 | .000119  | .000005  | -.000001 |
| 171   | .001062  | -.027586 | -.078480 | .000046  | .000002  | -.000002 |
| 172   | .001234  | -.028429 | -.079334 | -.000033 | .000003  | -.000003 |
| 173   | .001909  | -.019551 | -.080372 | -.000120 | .000010  | -.000004 |
| 174   | -.000129 | -.000092 | -.079863 | .000188  | .000013  | .000000  |
| 175   | .000919  | -.018624 | -.080788 | .000126  | .000007  | -.000002 |
| 176   | .001599  | -.029138 | -.081704 | .000052  | .000005  | -.000002 |
| 177   | .002182  | -.030325 | -.082592 | -.000033 | .000005  | -.000001 |
| 178   | .002770  | -.020965 | -.083452 | -.000129 | .000006  | -.000001 |
| 179   | -.000041 | -.000086 | -.080525 | .000193  | .000007  | .000000  |
| 180   | .000863  | -.018772 | -.081342 | .000126  | .000007  | -.000002 |
| 181   | .001596  | -.029267 | -.082167 | .000052  | .000006  | -.000002 |
| 182   | .002187  | -.030438 | -.083020 | -.000033 | .000005  | -.000001 |
| 183   | .002772  | -.021064 | -.083902 | -.000129 | .000005  | -.000001 |
| 184   | .000056  | -.000082 | -.081283 | .000194  | .000004  | .000000  |
| 185   | .000443  | -.018919 | -.082083 | .000127  | .000004  | .000001  |
| 186   | .001057  | -.029476 | -.082903 | .000052  | .000006  | .000001  |
| 187   | .001843  | -.030623 | -.083763 | -.000034 | .000007  | .000001  |
| 188   | .002620  | -.021166 | -.084666 | -.000129 | .000006  | .000001  |
| 189   | .000148  | -.000083 | -.081424 | .000191  | -.000002 | .000000  |
| 190   | .000378  | -.018815 | -.082386 | .000127  | .000005  | .000001  |
| 191   | .001054  | -.029385 | -.083326 | .000052  | .000006  | .000001  |
| 192   | .001849  | -.030542 | -.084226 | -.000034 | .000007  | .000001  |
| 193   | .002620  | -.021096 | -.085085 | -.000129 | .000006  | .000001  |
| 194   | .000230  | -.000042 | -.080474 | .000189  | -.000001 | .000000  |
| 195   | .000577  | -.018326 | -.080987 | .000122  | .000006  | .000000  |
| 196   | .001634  | -.028238 | -.081673 | .000046  | .000010  | .000001  |
| 197   | .002815  | -.028999 | -.082550 | -.000035 | .000008  | .000002  |
| 198   | .003480  | -.019874 | -.083613 | -.000123 | .000001  | .000004  |
| 199   | .000249  | -.000006 | -.080109 | .000191  | -.000004 | .000001  |
| 200   | .000538  | -.018292 | -.081219 | .000121  | .000007  | .000000  |
| 201   | .001634  | -.028124 | -.082157 | .000046  | .000010  | .000001  |
| 202   | .002819  | -.028806 | -.082904 | -.000035 | .000008  | .000002  |
| 203   | .003475  | -.019596 | -.083464 | -.000123 | .000001  | .000003  |
| 204   | .000182  | .000040  | -.078523 | .000185  | -.000001 | .000000  |
| 205   | .000629  | -.017331 | -.078937 | .000112  | .000007  | .000000  |
| 206   | .001671  | -.026087 | -.079420 | .000038  | .000009  | .000001  |
| 207   | .002719  | -.026188 | -.079995 | -.000036 | .000007  | .000002  |
| 208   | .003293  | -.017603 | -.080658 | -.000111 | .000001  | .000003  |
| 209   | .000000  | .000000  | -.078443 | .000185  | .000002  | -.000001 |
| 210   | .000647  | -.017282 | -.079086 | .000111  | .000007  | .000000  |
| 211   | .001688  | -.025904 | -.079582 | .000037  | .000009  | .000001  |
| 212   | .002712  | -.025871 | -.079887 | -.000037 | .000007  | .000002  |
| 213   | .003246  | -.017169 | -.080006 | -.000111 | .000001  | .000003  |
| 214   | -.000161 | -.000073 | -.078379 | .000188  | .000018  | -.000000 |
| 215   | .000174  | -.000060 | -.080719 | .000193  | -.000007 | .000001  |
| 216   | .000000  | .000000  | -.070784 | -.000175 | .000008  | -.000001 |
| 217   | .000678  | .016460  | -.071341 | -.000106 | .000004  | .000001  |
| 218   | .001020  | .024771  | -.071785 | -.000036 | .000003  | .000002  |
| 219   | .001383  | .024807  | -.072081 | .000035  | .000005  | .000003  |
| 220   | .002200  | .016472  | -.072234 | .000107  | .000011  | .000004  |
| 221   | -.000200 | -.000031 | -.072766 | -.000177 | .000012  | .000001  |
| 222   | .000711  | .016615  | -.073196 | -.000107 | .000005  | .000001  |
| 223   | .001047  | .025097  | -.073685 | -.000037 | .000002  | .000002  |
| 224   | .001371  | .025301  | -.074249 | .000034  | .000004  | .000003  |
| 225   | .002137  | .017095  | -.074886 | .000107  | .000010  | .000004  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 2 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|----------|----------|----------|----------|----------|----------|
| 226   | -.000251 | .000025  | -.076080 | -.000184 | .000016  | .000001  |
| 227   | .000811  | .017775  | -.077161 | -.000118 | .000005  | .000001  |
| 228   | .001063  | .027439  | -.078074 | -.000046 | .000001  | .000002  |
| 229   | .001229  | .028207  | -.078802 | .000034  | .000003  | .000003  |
| 230   | .001912  | .019248  | -.079347 | .000120  | .000010  | .000004  |
| 231   | -.000220 | .000060  | -.077309 | -.000184 | .000012  | .000000  |
| 232   | .000762  | .017847  | -.077811 | -.000119 | .000005  | .000001  |
| 233   | .001062  | .027586  | -.078480 | -.000046 | .000002  | .000002  |
| 234   | .001234  | .028429  | -.079334 | .000033  | .000003  | .000003  |
| 235   | .001909  | .019551  | -.080372 | .000120  | .000010  | .000004  |
| 236   | -.000129 | .000092  | -.079863 | -.000188 | .000013  | .000000  |
| 237   | .000919  | .018624  | -.080788 | -.000126 | .000007  | .000002  |
| 238   | .001599  | .029138  | -.081704 | -.000052 | .000005  | .000002  |
| 239   | .002182  | .030325  | -.082592 | .000033  | .000005  | .000001  |
| 240   | .002770  | .020965  | -.083452 | .000129  | .000006  | .000001  |
| 241   | -.000041 | .000086  | -.080525 | -.000193 | .000007  | .000000  |
| 242   | .000863  | .018772  | -.081342 | -.000126 | .000007  | .000002  |
| 243   | .001596  | .029267  | -.082167 | -.000052 | .000006  | .000002  |
| 244   | .002187  | .030438  | -.083020 | .000033  | .000005  | .000001  |
| 245   | .002772  | .021064  | -.083902 | .000129  | .000005  | .000001  |
| 246   | .000056  | .000082  | -.081283 | -.000194 | .000004  | .000000  |
| 247   | .000443  | .018919  | -.082083 | -.000127 | .000004  | -.000001 |
| 248   | .001057  | .029476  | -.082903 | -.000052 | .000006  | -.000001 |
| 249   | .001843  | .030623  | -.083763 | .000034  | .000007  | -.000001 |
| 250   | .002620  | .021166  | -.084666 | .000129  | .000006  | -.000001 |
| 251   | .000148  | .000083  | -.081424 | -.000191 | -.000002 | .000000  |
| 252   | .000378  | .018815  | -.082386 | -.000127 | .000005  | -.000001 |
| 253   | .001054  | .029385  | -.083326 | -.000052 | .000006  | -.000001 |
| 254   | .001849  | .030542  | -.084226 | .000034  | .000007  | -.000001 |
| 255   | .002620  | .021096  | -.085085 | .000129  | .000006  | -.000001 |
| 256   | .000230  | .000042  | -.080474 | -.000189 | -.000001 | -.000000 |
| 257   | .000577  | .018326  | -.080987 | -.000122 | .000006  | -.000000 |
| 258   | .001634  | .028238  | -.081673 | -.000046 | .000010  | -.000001 |
| 259   | .002815  | .028999  | -.082550 | .000035  | .000008  | -.000002 |
| 260   | .003480  | .019874  | -.083613 | .000123  | .000001  | -.000004 |
| 261   | .000249  | .000006  | -.080109 | -.000191 | -.000004 | -.000001 |
| 262   | .000538  | .018292  | -.081219 | -.000121 | .000007  | -.000000 |
| 263   | .001634  | .028124  | -.082157 | -.000046 | .000010  | -.000001 |
| 264   | .002819  | .028806  | -.082904 | .000035  | .000008  | -.000002 |
| 265   | .003475  | .019596  | -.083464 | .000123  | .000001  | -.000003 |
| 266   | .000182  | -.000040 | -.078523 | -.000185 | -.000001 | -.000000 |
| 267   | .000629  | .017331  | -.078937 | -.000112 | .000007  | -.000000 |
| 268   | .001671  | .026087  | -.079420 | -.000038 | .000009  | -.000001 |
| 269   | .002719  | .026188  | -.079995 | .000036  | .000007  | -.000002 |
| 270   | .003293  | .017603  | -.080658 | .000111  | .000001  | -.000003 |
| 271   | .000000  | .000000  | -.078443 | -.000185 | .000002  | .000001  |
| 272   | .000647  | .017282  | -.079086 | -.000111 | .000007  | -.000000 |
| 273   | .001688  | .025904  | -.079582 | -.000037 | .000009  | -.000001 |
| 274   | .002712  | .025871  | -.079887 | .000037  | .000007  | -.000002 |
| 275   | .003246  | .017169  | -.080006 | .000111  | .000001  | -.000003 |
| 276   | -.000161 | .000073  | -.078379 | -.000188 | .000018  | .000000  |
| 277   | .000174  | .000060  | -.080719 | -.000193 | -.000007 | -.000001 |
| 278   | -.000082 | .000012  | -.052344 | .000165  | .000010  | .000000  |
| 279   | -.000094 | .000017  | -.036763 | .000124  | .000011  | .000000  |
| 280   | -.000077 | .000012  | -.026548 | .000066  | .000010  | -.000000 |
| 281   | -.000068 | .000000  | -.023007 | .000000  | .000010  | .000000  |
| 282   | -.000077 | -.000012 | -.026548 | -.000066 | .000010  | .000000  |
| 283   | -.000094 | -.000017 | -.036763 | -.000124 | .000011  | .000000  |
| 284   | -.000082 | -.000012 | -.052344 | -.000165 | .000010  | -.000000 |
| 285   | -.000132 | .000030  | -.054169 | .000166  | .000014  | -.000000 |
| 286   | -.000089 | .000018  | -.038472 | .000126  | .000012  | -.000000 |
| 287   | -.000067 | .000008  | -.028142 | .000067  | .000010  | -.000000 |
| 288   | -.000059 | .000000  | -.024558 | .000000  | .000010  | .000000  |
| 289   | -.000067 | -.000008 | -.028142 | -.000067 | .000010  | .000000  |
| 290   | -.000089 | -.000018 | -.038472 | -.000126 | .000012  | .000000  |
| 291   | -.000132 | -.000030 | -.054169 | -.000166 | .000014  | .000000  |
| 292   | -.000145 | -.000014 | -.056543 | .000173  | .000015  | -.000001 |
| 293   | -.000080 | -.000010 | -.040275 | .000129  | .000012  | -.000000 |
| 294   | -.000051 | -.000005 | -.029674 | .000068  | .000010  | -.000000 |
| 295   | -.000043 | .000000  | -.026009 | .000000  | .000009  | .000000  |
| 296   | -.000051 | .000005  | -.029674 | -.000068 | .000010  | .000000  |
| 297   | -.000080 | .000010  | -.040275 | -.000129 | .000012  | .000000  |
| 298   | -.000145 | .000014  | -.056543 | -.000173 | .000015  | .000001  |
| 299   | -.000100 | -.000056 | -.058555 | .000176  | .000013  | -.000000 |
| 300   | -.000056 | -.000038 | -.041942 | .000133  | .000010  | -.000000 |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 2 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|----------|----------|----------|----------|----------|----------|
| 301   | -.000033 | -.000019 | -.031050 | .000070  | .000008  | -.000000 |
| 302   | -.000026 | .000000  | -.027278 | .000000  | .000007  | .000000  |
| 303   | -.000033 | .000019  | -.031050 | -.000070 | .000008  | .000000  |
| 304   | -.000056 | .000038  | -.041942 | -.000133 | .000010  | .000000  |
| 305   | -.000100 | .000056  | -.058555 | -.000176 | .000013  | .000000  |
| 306   | -.000031 | -.000070 | -.060205 | .000181  | .000008  | -.000000 |
| 307   | -.000018 | -.000050 | -.043161 | .000136  | .000006  | .000000  |
| 308   | -.000010 | -.000026 | -.032027 | .000072  | .000005  | .000000  |
| 309   | -.000008 | .000000  | -.028175 | .000000  | .000004  | .000000  |
| 310   | -.000010 | .000026  | -.032027 | -.000072 | .000005  | .000000  |
| 311   | -.000018 | .000050  | -.043161 | -.000136 | .000006  | .000000  |
| 312   | -.000031 | .000070  | -.060205 | -.000181 | .000008  | .000000  |
| 313   | .000040  | -.000069 | -.060872 | .000182  | .000002  | .000000  |
| 314   | .000024  | -.000049 | -.043698 | .000137  | .000001  | .000000  |
| 315   | .000015  | -.000025 | -.032471 | .000072  | .000001  | .000000  |
| 316   | .000011  | .000000  | -.028587 | .000000  | .000001  | .000000  |
| 317   | .000015  | .000025  | -.032471 | -.000072 | .000001  | .000000  |
| 318   | .000024  | .000049  | -.043698 | -.000137 | .000001  | -.000000 |
| 319   | .000040  | .000069  | -.060872 | -.000182 | .000002  | -.000000 |
| 320   | .000107  | -.000052 | -.060600 | .000180  | -.000003 | .000000  |
| 321   | .000060  | -.000035 | -.043578 | .000136  | -.000002 | .000000  |
| 322   | .000037  | -.000018 | -.032419 | .000072  | -.000002 | .000000  |
| 323   | .000030  | .000000  | -.028554 | .000000  | -.000001 | .000000  |
| 324   | .000037  | .000018  | -.032419 | -.000072 | -.000002 | -.000000 |
| 325   | .000060  | .000035  | -.043578 | -.000136 | -.000002 | -.000000 |
| 326   | .000107  | .000052  | -.060600 | -.000180 | -.000003 | -.000000 |
| 327   | .000145  | -.000009 | -.060015 | .000180  | -.000004 | .000001  |
| 328   | .000082  | -.000006 | -.043111 | .000134  | -.000003 | .000000  |
| 329   | .000054  | -.000003 | -.032084 | .000071  | -.000002 | .000000  |
| 330   | .000046  | .000000  | -.028269 | .000000  | -.000002 | .000000  |
| 331   | .000054  | .000003  | -.032084 | -.000071 | -.000002 | -.000000 |
| 332   | .000082  | .000006  | -.043111 | -.000134 | -.000003 | -.000000 |
| 333   | .000145  | .000009  | -.060015 | -.000180 | -.000004 | -.000001 |
| 334   | .000129  | .000031  | -.059158 | .000174  | -.000003 | .000000  |
| 335   | .000091  | .000020  | -.042643 | .000132  | -.000003 | .000000  |
| 336   | .000069  | .000009  | -.031745 | .000071  | -.000002 | .000000  |
| 337   | .000061  | .000000  | -.027960 | .000000  | -.000002 | .000000  |
| 338   | .000069  | -.000009 | -.031745 | -.000071 | -.000002 | -.000000 |
| 339   | .000091  | -.000020 | -.042643 | -.000132 | -.000003 | -.000000 |
| 340   | .000129  | -.000031 | -.059158 | -.000174 | -.000003 | -.000000 |
| 341   | .000086  | .000012  | -.058911 | .000175  | -.000000 | -.000000 |
| 342   | .000096  | .000018  | -.042345 | .000132  | -.000001 | .000000  |
| 343   | .000077  | .000012  | -.031458 | .000070  | -.000002 | .000000  |
| 344   | .000068  | .000000  | -.027681 | .000000  | -.000002 | .000000  |
| 345   | .000077  | -.000012 | -.031458 | -.000070 | -.000002 | -.000000 |
| 346   | .000096  | -.000018 | -.042345 | -.000132 | -.000001 | .000000  |
| 347   | .000086  | -.000012 | -.058911 | -.000175 | -.000000 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 3 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)    | U(Y)     | U(Z)     | R(X)     | R(Y)    | R(Z)     |
|-------|---------|----------|----------|----------|---------|----------|
| 1     | .002027 | -.000113 | -.031748 | -.000087 | .000011 | .000001  |
| 2     | .001930 | -.000100 | -.040631 | -.000080 | .000020 | .000001  |
| 3     | .001855 | -.000073 | -.048174 | -.000062 | .000028 | .000001  |
| 4     | .001811 | -.000038 | -.053253 | -.000034 | .000034 | .000000  |
| 5     | .001797 | .000000  | -.055045 | .000000  | .000036 | .000000  |
| 6     | .001811 | .000038  | -.053253 | .000034  | .000034 | -.000000 |
| 7     | .001855 | .000073  | -.048174 | .000062  | .000028 | -.000001 |
| 8     | .001930 | .000100  | -.040631 | .000080  | .000020 | -.000001 |
| 9     | .002027 | .000113  | -.031748 | .000087  | .000011 | -.000001 |
| 10    | .002009 | -.000016 | -.033526 | -.000099 | .000011 | .000001  |
| 11    | .001917 | -.000020 | -.044006 | -.000095 | .000023 | .000001  |
| 12    | .001848 | -.000016 | -.053070 | -.000073 | .000032 | .000000  |
| 13    | .001808 | -.000009 | -.059176 | -.000040 | .000039 | .000000  |
| 14    | .001795 | .000000  | -.061325 | .000000  | .000041 | .000000  |
| 15    | .001808 | .000009  | -.059176 | .000040  | .000039 | -.000000 |
| 16    | .001848 | .000016  | -.053070 | .000073  | .000032 | -.000000 |
| 17    | .001917 | .000020  | -.044006 | .000095  | .000023 | -.000001 |
| 18    | .002009 | .000016  | -.033526 | .000099  | .000011 | -.000001 |
| 19    | .001977 | .000019  | -.034569 | -.000107 | .000015 | .000000  |
| 20    | .001900 | .000014  | -.045844 | -.000103 | .000024 | .000000  |
| 21    | .001839 | .000009  | -.055685 | -.000080 | .000035 | .000000  |
| 22    | .001803 | .000004  | -.062325 | -.000043 | .000042 | .000000  |
| 23    | .001791 | .000000  | -.064661 | .000000  | .000044 | .000000  |
| 24    | .001803 | -.000004 | -.062325 | .000043  | .000042 | -.000000 |
| 25    | .001839 | -.000009 | -.055685 | .000080  | .000035 | -.000000 |
| 26    | .001900 | -.000014 | -.045844 | .000103  | .000024 | -.000000 |
| 27    | .001977 | -.000019 | -.034569 | .000107  | .000015 | -.000000 |
| 28    | .001956 | .000040  | -.035549 | -.000114 | .000011 | .000000  |
| 29    | .001879 | .000034  | -.047711 | -.000111 | .000023 | .000000  |
| 30    | .001826 | .000024  | -.058424 | -.000086 | .000035 | .000000  |
| 31    | .001796 | .000012  | -.065579 | -.000047 | .000041 | .000000  |
| 32    | .001786 | .000000  | -.068130 | .000000  | .000044 | .000000  |
| 33    | .001796 | -.000012 | -.065579 | .000047  | .000041 | -.000000 |
| 34    | .001826 | -.000024 | -.058424 | .000086  | .000035 | -.000000 |
| 35    | .001879 | -.000034 | -.047711 | .000111  | .000023 | -.000000 |
| 36    | .001956 | -.000040 | -.035549 | .000114  | .000011 | -.000000 |
| 37    | .001920 | .000060  | -.036356 | -.000121 | .000010 | .000000  |
| 38    | .001855 | .000048  | -.049426 | -.000120 | .000020 | .000000  |
| 39    | .001811 | .000034  | -.060990 | -.000092 | .000029 | .000000  |
| 40    | .001786 | .000017  | -.068580 | -.000050 | .000035 | .000000  |
| 41    | .001778 | .000000  | -.071362 | .000000  | .000037 | .000000  |
| 42    | .001786 | -.000017 | -.068580 | .000050  | .000035 | .000000  |
| 43    | .001811 | -.000034 | -.060990 | .000092  | .000029 | -.000000 |
| 44    | .001855 | -.000048 | -.049426 | .000120  | .000020 | -.000000 |
| 45    | .001920 | -.000060 | -.036356 | .000121  | .000010 | -.000000 |
| 46    | .001868 | .000067  | -.037188 | -.000128 | .000010 | .000000  |
| 47    | .001825 | .000057  | -.050842 | -.000125 | .000016 | .000000  |
| 48    | .001793 | .000040  | -.062942 | -.000097 | .000022 | .000000  |
| 49    | .001774 | .000021  | -.070955 | -.000052 | .000026 | .000000  |
| 50    | .001768 | .000000  | -.073843 | .000000  | .000027 | .000000  |
| 51    | .001774 | -.000021 | -.070955 | .000052  | .000026 | .000000  |
| 52    | .001793 | -.000040 | -.062942 | .000097  | .000022 | -.000000 |
| 53    | .001825 | -.000057 | -.050842 | .000125  | .000016 | -.000000 |
| 54    | .001868 | -.000067 | -.037188 | .000128  | .000010 | -.000000 |
| 55    | .001825 | .000076  | -.037774 | -.000130 | .000006 | .000000  |
| 56    | .001794 | .000063  | -.051829 | -.000129 | .000010 | .000000  |
| 57    | .001773 | .000045  | -.064328 | -.000100 | .000013 | .000000  |
| 58    | .001760 | .000023  | -.072571 | -.000054 | .000016 | .000000  |
| 59    | .001756 | .000000  | -.075584 | .000000  | .000017 | .000000  |
| 60    | .001760 | -.000023 | -.072571 | .000054  | .000016 | .000000  |
| 61    | .001773 | -.000045 | -.064328 | .000100  | .000013 | .000000  |
| 62    | .001794 | -.000063 | -.051829 | .000129  | .000010 | -.000000 |
| 63    | .001825 | -.000076 | -.037774 | .000130  | .000006 | -.000000 |
| 64    | .001775 | .000080  | -.038164 | -.000132 | .000005 | .000000  |
| 65    | .001761 | .000066  | -.052425 | -.000131 | .000006 | .000000  |
| 66    | .001751 | .000047  | -.065022 | -.000102 | .000006 | .000000  |
| 67    | .001745 | .000024  | -.073469 | -.000055 | .000008 | .000000  |
| 68    | .001743 | .000000  | -.076474 | .000000  | .000008 | .000000  |
| 69    | .001745 | -.000024 | -.073469 | .000055  | .000008 | .000000  |
| 70    | .001751 | -.000047 | -.065022 | .000102  | .000006 | .000000  |
| 71    | .001761 | -.000066 | -.052425 | .000131  | .000006 | .000000  |
| 72    | .001775 | -.000080 | -.038164 | .000132  | .000005 | .000000  |
| 73    | .001724 | .000077  | -.038471 | -.000134 | .000003 | .000000  |
| 74    | .001727 | .000066  | -.052765 | -.000131 | .000003 | .000000  |
| 75    | .001728 | .000047  | -.065370 | -.000102 | .000003 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 3 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)    | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|---------|----------|----------|----------|----------|----------|
| 76    | .001729 | .000025  | -.073895 | -.000056 | .000003  | .000000  |
| 77    | .001730 | .000000  | -.076894 | .000000  | .000003  | .000000  |
| 78    | .001729 | -.000025 | -.073895 | .000056  | .000003  | .000000  |
| 79    | .001728 | -.000047 | -.065370 | .000102  | .000003  | .000000  |
| 80    | .001727 | -.000066 | -.052765 | .000131  | .000003  | .000000  |
| 81    | .001724 | -.000077 | -.038471 | .000134  | .000003  | .000000  |
| 82    | .001673 | .000079  | -.038574 | -.000133 | .000001  | .000000  |
| 83    | .001692 | .000065  | -.052886 | -.000131 | .000000  | .000000  |
| 84    | .001706 | .000046  | -.065525 | -.000102 | .000000  | .000000  |
| 85    | .001714 | .000024  | -.073998 | -.000055 | -.000001 | .000000  |
| 86    | .001716 | .000000  | -.077013 | .000000  | -.000001 | .000000  |
| 87    | .001714 | -.000024 | -.073998 | .000055  | -.000001 | .000000  |
| 88    | .001706 | -.000046 | -.065525 | .000102  | .000000  | .000000  |
| 89    | .001692 | -.000065 | -.052886 | .000131  | .000000  | .000000  |
| 90    | .001673 | -.000079 | -.038574 | .000133  | .000001  | .000000  |
| 91    | .001624 | .000074  | -.038611 | -.000131 | -.000000 | -.000000 |
| 92    | .001660 | .000061  | -.052758 | -.000130 | -.000004 | -.000000 |
| 93    | .001685 | .000044  | -.065336 | -.000101 | -.000007 | .000000  |
| 94    | .001699 | .000023  | -.073632 | -.000055 | -.000009 | .000000  |
| 95    | .001704 | .000000  | -.076663 | .000000  | -.000010 | .000000  |
| 96    | .001699 | -.000023 | -.073632 | .000055  | -.000009 | .000000  |
| 97    | .001685 | -.000044 | -.065336 | .000101  | -.000007 | .000000  |
| 98    | .001660 | -.000061 | -.052758 | .000130  | -.000004 | .000000  |
| 99    | .001624 | -.000074 | -.038611 | .000131  | -.000000 | .000000  |
| 100   | .001582 | .000065  | -.038448 | -.000129 | -.000005 | -.000000 |
| 101   | .001629 | .000055  | -.052240 | -.000127 | -.000010 | -.000000 |
| 102   | .001665 | .000039  | -.064459 | -.000098 | -.000015 | -.000000 |
| 103   | .001686 | .000020  | -.072551 | -.000053 | -.000019 | .000000  |
| 104   | .001693 | .000000  | -.075466 | .000000  | -.000020 | .000000  |
| 105   | .001686 | -.000020 | -.072551 | .000053  | -.000019 | .000000  |
| 106   | .001665 | -.000039 | -.064459 | .000098  | -.000015 | .000000  |
| 107   | .001629 | -.000055 | -.052240 | .000127  | -.000010 | .000000  |
| 108   | .001582 | -.000065 | -.038448 | .000129  | -.000005 | .000000  |
| 109   | .001532 | .000057  | -.038042 | -.000123 | -.000005 | -.000000 |
| 110   | .001601 | .000045  | -.051299 | -.000122 | -.000014 | -.000000 |
| 111   | .001648 | .000031  | -.063020 | -.000094 | -.000023 | -.000000 |
| 112   | .001674 | .000016  | -.070714 | -.000051 | -.000028 | .000000  |
| 113   | .001683 | .000000  | -.073531 | .000000  | -.000030 | .000000  |
| 114   | .001674 | -.000016 | -.070714 | .000051  | -.000028 | .000000  |
| 115   | .001648 | -.000031 | -.063020 | .000094  | -.000023 | .000000  |
| 116   | .001601 | -.000045 | -.051299 | .000122  | -.000014 | .000000  |
| 117   | .001532 | -.000057 | -.038042 | .000123  | -.000005 | .000000  |
| 118   | .001497 | .000035  | -.037676 | -.000116 | -.000005 | -.000000 |
| 119   | .001578 | .000029  | -.050063 | -.000113 | -.000017 | -.000000 |
| 120   | .001633 | .000020  | -.060967 | -.000088 | -.000028 | -.000000 |
| 121   | .001666 | .000010  | -.068249 | -.000048 | -.000034 | -.000000 |
| 122   | .001676 | .000000  | -.070844 | .000000  | -.000037 | .000000  |
| 123   | .001666 | -.000010 | -.068249 | .000048  | -.000034 | .000000  |
| 124   | .001633 | -.000020 | -.060967 | .000088  | -.000028 | .000000  |
| 125   | .001578 | -.000029 | -.050063 | .000113  | -.000017 | .000000  |
| 126   | .001497 | -.000035 | -.037676 | .000116  | -.000005 | .000000  |
| 127   | .001478 | .000012  | -.037135 | -.000110 | -.000009 | -.000000 |
| 128   | .001559 | .000008  | -.048673 | -.000105 | -.000018 | -.000000 |
| 129   | .001622 | .000004  | -.058736 | -.000082 | -.000028 | -.000000 |
| 130   | .001659 | .000002  | -.065524 | -.000044 | -.000035 | -.000000 |
| 131   | .001671 | .000000  | -.067912 | .000000  | -.000037 | .000000  |
| 132   | .001659 | -.000002 | -.065524 | .000044  | -.000035 | .000000  |
| 133   | .001622 | -.000004 | -.058736 | .000082  | -.000028 | .000000  |
| 134   | .001559 | -.000008 | -.048673 | .000105  | -.000018 | .000000  |
| 135   | .001478 | -.000012 | -.037135 | .000110  | -.000009 | .000000  |
| 136   | .001446 | -.000024 | -.036518 | -.000102 | -.000006 | -.000001 |
| 137   | .001543 | -.000027 | -.047300 | -.000098 | -.000017 | -.000001 |
| 138   | .001615 | -.000021 | -.056612 | -.000075 | -.000026 | -.000000 |
| 139   | .001655 | -.000012 | -.062884 | -.000041 | -.000032 | -.000000 |
| 140   | .001668 | .000000  | -.065092 | .000000  | -.000035 | .000000  |
| 141   | .001655 | .000012  | -.062884 | .000041  | -.000032 | .000000  |
| 142   | .001615 | .000021  | -.056612 | .000075  | -.000026 | .000000  |
| 143   | .001543 | .000027  | -.047300 | .000098  | -.000017 | .000001  |
| 144   | .001446 | .000024  | -.036518 | .000102  | -.000006 | .000001  |
| 145   | .001431 | -.000121 | -.035726 | -.000092 | -.000006 | -.000001 |
| 146   | .001533 | -.000107 | -.045127 | -.000085 | -.000015 | -.000001 |
| 147   | .001610 | -.000078 | -.053133 | -.000066 | -.000023 | -.000001 |
| 148   | .001653 | -.000041 | -.058530 | -.000036 | -.000029 | -.000000 |
| 149   | .001667 | .000000  | -.060434 | .000000  | -.000031 | .000000  |
| 150   | .001653 | .000041  | -.058530 | .000036  | -.000029 | .000000  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 3 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|----------|----------|----------|----------|----------|----------|
| 151   | .001610  | .000078  | -.053133 | .000066  | -.000023 | .000001  |
| 152   | .001533  | .000107  | -.045127 | .000085  | -.000015 | .000001  |
| 153   | .001431  | .000121  | -.035726 | .000092  | -.000006 | .000001  |
| 154   | .000000  | .000000  | -.031279 | .000080  | .000004  | .000000  |
| 155   | .000318  | -.007702 | -.031509 | .000052  | .000002  | -.000001 |
| 156   | .000472  | -.011951 | -.031678 | .000021  | .000001  | -.000001 |
| 157   | .000652  | -.012314 | -.031770 | -.000014 | .000003  | -.000002 |
| 158   | .001085  | -.008383 | -.031785 | -.000053 | .000006  | -.000003 |
| 159   | -.000101 | .000006  | -.032264 | .000080  | .000006  | -.000000 |
| 160   | .000333  | -.007817 | -.032447 | .000053  | .000002  | -.000001 |
| 161   | .000485  | -.012179 | -.032661 | .000021  | .000001  | -.000001 |
| 162   | .000649  | -.012655 | -.032914 | -.000014 | .000002  | -.000002 |
| 163   | .001063  | -.008809 | -.033207 | -.000053 | .000005  | -.000002 |
| 164   | -.000122 | -.000027 | -.033902 | .000084  | .000008  | -.000000 |
| 165   | .000452  | -.008508 | -.034389 | .000060  | .000003  | -.000001 |
| 166   | .000634  | -.013645 | -.034800 | .000027  | .000001  | -.000001 |
| 167   | .000753  | -.014522 | -.035127 | -.000013 | .000002  | -.000002 |
| 168   | .001085  | -.010221 | -.035370 | -.000061 | .000005  | -.000002 |
| 169   | -.000108 | -.000045 | -.034530 | .000084  | .000006  | .000000  |
| 170   | .000431  | -.008570 | -.034738 | .000060  | .000003  | -.000001 |
| 171   | .000634  | -.013751 | -.035021 | .000027  | .000001  | -.000001 |
| 172   | .000755  | -.014672 | -.035389 | -.000013 | .000002  | -.000002 |
| 173   | .001084  | -.010418 | -.035840 | -.000061 | .000005  | -.000002 |
| 174   | -.000067 | -.000064 | -.035829 | .000087  | .000006  | .000000  |
| 175   | .000417  | -.009042 | -.036256 | .000065  | .000003  | -.000001 |
| 176   | .000712  | -.014740 | -.036670 | .000031  | .000002  | -.000001 |
| 177   | .000984  | -.015918 | -.037061 | -.000013 | .000002  | -.000001 |
| 178   | .001314  | -.011368 | -.037427 | -.000067 | .000003  | -.000001 |
| 179   | -.000023 | -.000062 | -.036153 | .000089  | .000004  | .000000  |
| 180   | .000390  | -.009110 | -.036517 | .000065  | .000003  | -.000001 |
| 181   | .000711  | -.014808 | -.036894 | .000031  | .000002  | -.000001 |
| 182   | .000987  | -.015986 | -.037295 | -.000013 | .000003  | -.000001 |
| 183   | .001319  | -.011438 | -.037719 | -.000067 | .000003  | -.000001 |
| 184   | .000032  | -.000061 | -.036546 | .000089  | .000002  | .000000  |
| 185   | .000280  | -.009190 | -.036900 | .000065  | .000003  | .000001  |
| 186   | .000654  | -.014925 | -.037274 | .000031  | .000004  | .000001  |
| 187   | .001087  | -.016094 | -.037679 | -.000013 | .000004  | .000001  |
| 188   | .001458  | -.011502 | -.038114 | -.000067 | .000003  | .000001  |
| 189   | .000078  | -.000060 | -.036634 | .000088  | -.000001 | .000000  |
| 190   | .000250  | -.009146 | -.037080 | .000065  | .000003  | .000001  |
| 191   | .000652  | -.014879 | -.037507 | .000031  | .000004  | .000001  |
| 192   | .001090  | -.016045 | -.037904 | -.000013 | .000004  | .000001  |
| 193   | .001462  | -.011449 | -.038270 | -.000067 | .000002  | .000001  |
| 194   | .000114  | -.000037 | -.036158 | .000087  | -.000001 | .000000  |
| 195   | .000256  | -.008833 | -.036371 | .000061  | .000003  | .000001  |
| 196   | .000751  | -.014122 | -.036664 | .000028  | .000005  | .000001  |
| 197   | .001328  | -.015011 | -.037044 | -.000014 | .000004  | .000002  |
| 198   | .001691  | -.010621 | -.037509 | -.000063 | .000001  | .000002  |
| 199   | .000122  | -.000017 | -.035972 | .000088  | -.000002 | .000000  |
| 200   | .000239  | -.008792 | -.036476 | .000061  | .000003  | .000001  |
| 201   | .000751  | -.014035 | -.036901 | .000027  | .000005  | .000001  |
| 202   | .001330  | -.014879 | -.037239 | -.000014 | .000004  | .000002  |
| 203   | .001690  | -.010440 | -.037491 | -.000063 | .000001  | .000002  |
| 204   | .000092  | .000010  | -.035221 | .000085  | -.000000 | .000000  |
| 205   | .000354  | -.008214 | -.035397 | .000055  | .000004  | .000000  |
| 206   | .000911  | -.012754 | -.035609 | .000022  | .000005  | .000001  |
| 207   | .001455  | -.013198 | -.035870 | -.000015 | .000004  | .000002  |
| 208   | .001733  | -.009138 | -.036177 | -.000055 | .000000  | .000002  |
| 209   | .000000  | .000000  | -.035216 | .000085  | .000001  | -.000000 |
| 210   | .000363  | -.008164 | -.035494 | .000055  | .000004  | .000000  |
| 211   | .000920  | -.012617 | -.035694 | .000021  | .000005  | .000001  |
| 212   | .001453  | -.012973 | -.035794 | -.000015 | .000003  | .000002  |
| 213   | .001718  | -.008838 | -.035795 | -.000055 | .000000  | .000002  |
| 214   | -.000081 | -.000051 | -.035099 | .000086  | .000009  | -.000000 |
| 215   | .000088  | -.000045 | -.036304 | .000089  | -.000004 | .000000  |
| 216   | .000000  | .000000  | -.031279 | -.000080 | .000004  | -.000000 |
| 217   | .000318  | .007702  | -.031509 | -.000052 | .000002  | .000001  |
| 218   | .000472  | .011951  | -.031678 | -.000021 | .000001  | .000001  |
| 219   | .000652  | .012314  | -.031770 | .000014  | .000003  | .000002  |
| 220   | .001085  | .008383  | -.031785 | .000053  | .000006  | .000003  |
| 221   | -.000101 | -.000006 | -.032264 | -.000080 | .000006  | .000000  |
| 222   | .000333  | .007817  | -.032447 | -.000053 | .000002  | .000001  |
| 223   | .000485  | .012179  | -.032661 | -.000021 | .000001  | .000001  |
| 224   | .000649  | .012655  | -.032914 | .000014  | .000002  | .000002  |
| 225   | .001063  | .008809  | -.033207 | .000053  | .000005  | .000002  |

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 3 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|----------|----------|----------|----------|----------|----------|
| 226   | -.000122 | .000027  | -.033902 | -.000084 | .000008  | .000000  |
| 227   | .000452  | .008508  | -.034389 | -.000060 | .000003  | .000001  |
| 228   | .000634  | .013645  | -.034800 | -.000027 | .000001  | .000001  |
| 229   | .000753  | .014522  | -.035127 | .000013  | .000002  | .000002  |
| 230   | .001085  | .010221  | -.035370 | .000061  | .000005  | .000002  |
| 231   | -.000108 | .000045  | -.034530 | -.000084 | .000006  | .000000  |
| 232   | .000431  | .008570  | -.034738 | -.000060 | .000003  | .000001  |
| 233   | .000634  | .013751  | -.035021 | -.000027 | .000001  | .000001  |
| 234   | .000755  | .014672  | -.035389 | .000013  | .000002  | .000002  |
| 235   | .001084  | .010418  | -.035840 | .000061  | .000005  | .000002  |
| 236   | -.000067 | .000064  | -.035829 | -.000087 | .000006  | .000000  |
| 237   | .000417  | .009042  | -.036256 | -.000065 | .000003  | .000001  |
| 238   | .000712  | .014740  | -.036670 | -.000031 | .000002  | .000001  |
| 239   | .000984  | .015918  | -.037061 | .000013  | .000002  | .000001  |
| 240   | .001314  | .011368  | -.037427 | .000067  | .000003  | .000001  |
| 241   | -.000023 | .000062  | -.036153 | -.000089 | .000004  | .000000  |
| 242   | .000390  | .009110  | -.036517 | -.000065 | .000003  | .000001  |
| 243   | .000711  | .014808  | -.036894 | -.000031 | .000002  | .000001  |
| 244   | .000987  | .015986  | -.037295 | .000013  | .000003  | .000001  |
| 245   | .001319  | .011438  | -.037719 | .000067  | .000003  | .000001  |
| 246   | .000032  | .000061  | -.036546 | -.000089 | .000002  | .000000  |
| 247   | .000280  | .009190  | -.036900 | -.000065 | .000003  | -.000001 |
| 248   | .000654  | .014925  | -.037274 | -.000031 | .000004  | -.000001 |
| 249   | .001087  | .016094  | -.037679 | .000013  | .000004  | -.000001 |
| 250   | .001458  | .011502  | -.038114 | .000067  | .000003  | -.000001 |
| 251   | .000078  | .000060  | -.036634 | -.000088 | -.000001 | .000000  |
| 252   | .000250  | .009146  | -.037080 | -.000065 | .000003  | -.000001 |
| 253   | .000652  | .014879  | -.037507 | -.000031 | .000004  | -.000001 |
| 254   | .001090  | .016045  | -.037904 | .000013  | .000004  | -.000001 |
| 255   | .001462  | .011449  | -.038270 | .000067  | .000002  | -.000001 |
| 256   | .000114  | .000037  | -.036158 | -.000087 | -.000001 | .000000  |
| 257   | .000256  | .008833  | -.036371 | -.000061 | .000003  | -.000001 |
| 258   | .000751  | .014122  | -.036664 | -.000028 | .000005  | -.000001 |
| 259   | .001328  | .015011  | -.037044 | .000014  | .000004  | -.000002 |
| 260   | .001691  | .010621  | -.037509 | .000063  | .000001  | -.000002 |
| 261   | .000122  | .000017  | -.035972 | -.000088 | -.000002 | -.000000 |
| 262   | .000239  | .008792  | -.036476 | -.000061 | .000003  | -.000001 |
| 263   | .000751  | .014035  | -.036901 | -.000027 | .000005  | -.000001 |
| 264   | .001330  | .014879  | -.037239 | .000014  | .000004  | -.000002 |
| 265   | .001690  | .010440  | -.037491 | .000063  | .000001  | -.000002 |
| 266   | .000092  | -.000010 | -.035221 | -.000085 | -.000000 | -.000000 |
| 267   | .000354  | .008214  | -.035397 | -.000055 | .000004  | -.000000 |
| 268   | .000911  | .012754  | -.035609 | -.000022 | .000005  | -.000001 |
| 269   | .001455  | .013198  | -.035870 | .000015  | .000004  | -.000002 |
| 270   | .001733  | .009138  | -.036177 | .000055  | .000000  | -.000002 |
| 271   | .000000  | .000000  | -.035216 | -.000085 | .000001  | .000000  |
| 272   | .000363  | .008164  | -.035494 | -.000055 | .000004  | -.000000 |
| 273   | .000920  | .012617  | -.035694 | -.000021 | .000005  | -.000001 |
| 274   | .001453  | .012973  | -.035794 | .000015  | .000003  | -.000002 |
| 275   | .001718  | .008838  | -.035795 | .000055  | .000000  | -.000002 |
| 276   | -.000081 | .000051  | -.035099 | -.000086 | .000009  | .000000  |
| 277   | .000088  | .000045  | -.036304 | -.000089 | -.000004 | -.000000 |
| 278   | -.000038 | .000005  | -.022949 | .000074  | .000005  | .000000  |
| 279   | -.000043 | .000007  | -.015944 | .000056  | .000005  | .000000  |
| 280   | -.000033 | .000005  | -.011363 | .000030  | .000005  | .000000  |
| 281   | -.000028 | .000000  | -.009777 | .000000  | .000005  | .000000  |
| 282   | -.000033 | -.000005 | -.011363 | -.000030 | .000005  | .000000  |
| 283   | -.000043 | -.000007 | -.015944 | -.000056 | .000005  | .000000  |
| 284   | -.000038 | -.000005 | -.022949 | -.000074 | .000005  | -.000000 |
| 285   | -.000063 | .000008  | -.023844 | .000075  | .000007  | -.000000 |
| 286   | -.000040 | .000005  | -.016777 | .000056  | .000006  | -.000000 |
| 287   | -.000028 | .000002  | -.012138 | .000030  | .000005  | .000000  |
| 288   | -.000025 | .000000  | -.010530 | .000000  | .000005  | .000000  |
| 289   | -.000028 | -.000002 | -.012138 | -.000030 | .000005  | .000000  |
| 290   | -.000040 | -.000005 | -.016777 | -.000056 | .000006  | .000000  |
| 291   | -.000063 | -.000008 | -.023844 | -.000075 | .000007  | .000000  |
| 292   | -.000069 | -.000018 | -.025012 | .000078  | .000007  | -.000000 |
| 293   | -.000036 | -.000012 | -.017662 | .000058  | .000006  | -.000000 |
| 294   | -.000022 | -.000006 | -.012886 | .000031  | .000005  | .000000  |
| 295   | -.000017 | .000000  | -.011237 | .000000  | .000004  | .000000  |
| 296   | -.000022 | .000006  | -.012886 | -.000031 | .000005  | .000000  |
| 297   | -.000036 | .000012  | -.017662 | -.000058 | .000006  | .000000  |
| 298   | -.000069 | .000018  | -.025012 | -.000078 | .000007  | .000000  |
| 299   | -.000049 | -.000039 | -.026032 | .000080  | .000007  | -.000000 |
| 300   | -.000025 | -.000027 | -.018489 | .000060  | .000005  | -.000000 |

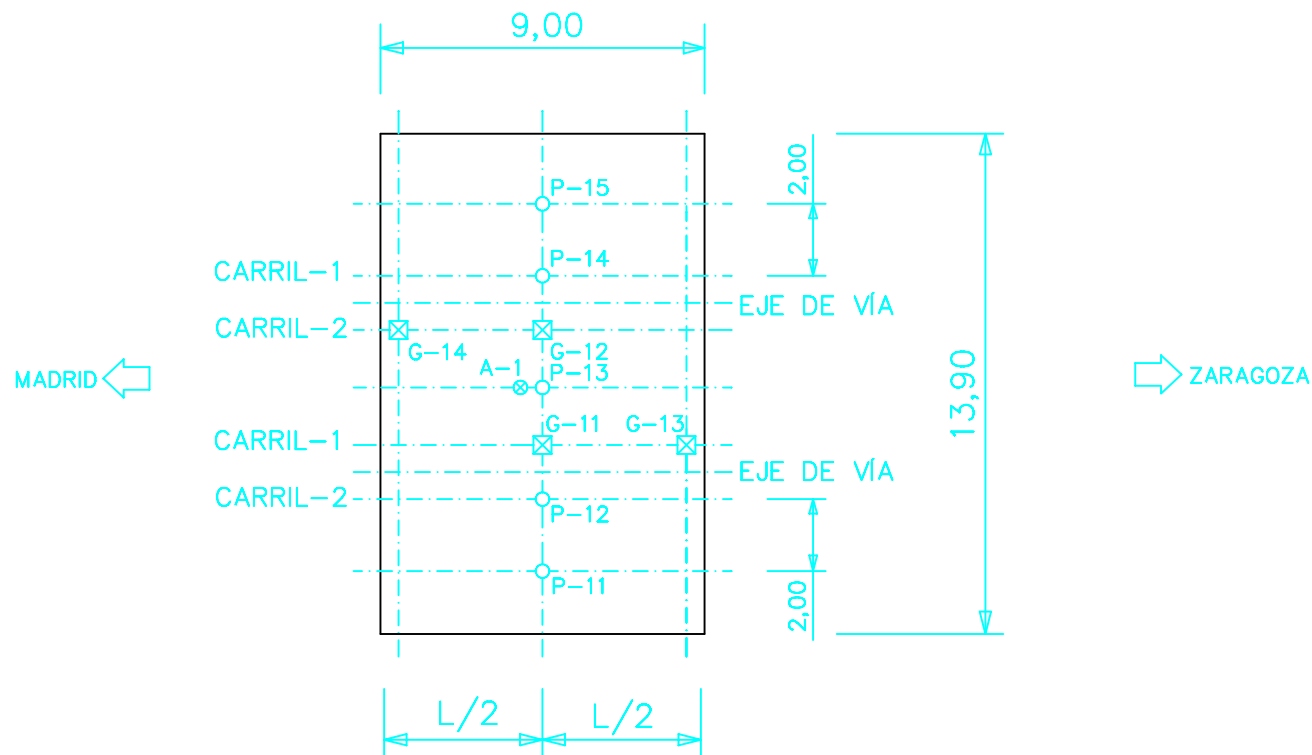
J O I N T D I S P L A C E M E N T S

LOAD CONDITION 3 - DISPLACEMENTS "U" AND ROTATIONS "R"

| JOINT | U(X)     | U(Y)     | U(Z)     | R(X)     | R(Y)     | R(Z)     |
|-------|----------|----------|----------|----------|----------|----------|
| 301   | -.000013 | -.000013 | -.013561 | .000032  | .000004  | .000000  |
| 302   | -.000010 | .000000  | -.011857 | .000000  | .000004  | .000000  |
| 303   | -.000013 | .000013  | -.013561 | -.000032 | .000004  | .000000  |
| 304   | -.000025 | .000027  | -.018489 | -.000060 | .000005  | .000000  |
| 305   | -.000049 | .000039  | -.026032 | -.000080 | .000007  | .000000  |
| 306   | -.000015 | -.000050 | -.026843 | .000083  | .000004  | .000000  |
| 307   | -.000008 | -.000034 | -.019090 | .000062  | .000003  | .000000  |
| 308   | -.000003 | -.000017 | -.014042 | .000033  | .000002  | .000000  |
| 309   | -.000002 | .000000  | -.012299 | .000000  | .000002  | .000000  |
| 310   | -.000003 | .000017  | -.014042 | -.000033 | .000002  | .000000  |
| 311   | -.000008 | .000034  | -.019090 | -.000062 | .000003  | .000000  |
| 312   | -.000015 | .000050  | -.026843 | -.000083 | .000004  | .000000  |
| 313   | .000021  | -.000049 | -.027183 | .000083  | .000001  | .000000  |
| 314   | .000013  | -.000034 | -.019362 | .000062  | .000001  | .000000  |
| 315   | .000008  | -.000017 | -.014266 | .000033  | .000001  | .000000  |
| 316   | .000006  | .000000  | -.012506 | .000000  | .000001  | .000000  |
| 317   | .000008  | .000017  | -.014266 | -.000033 | .000001  | .000000  |
| 318   | .000013  | .000034  | -.019362 | -.000062 | .000001  | .000000  |
| 319   | .000021  | .000049  | -.027183 | -.000083 | .000001  | .000000  |
| 320   | .000054  | -.000037 | -.027077 | .000082  | -.000002 | .000000  |
| 321   | .000029  | -.000025 | -.019319 | .000062  | -.000001 | .000000  |
| 322   | .000017  | -.000013 | -.014252 | .000033  | -.000001 | .000000  |
| 323   | .000014  | .000000  | -.012500 | .000000  | -.000001 | .000000  |
| 324   | .000017  | .000013  | -.014252 | -.000033 | -.000001 | .000000  |
| 325   | .000029  | .000025  | -.019319 | -.000062 | -.000001 | -.000000 |
| 326   | .000054  | .000037  | -.027077 | -.000082 | -.000002 | -.000000 |
| 327   | .000071  | -.000015 | -.026784 | .000082  | -.000002 | .000000  |
| 328   | .000039  | -.000010 | -.019099 | .000061  | -.000002 | .000000  |
| 329   | .000025  | -.000005 | -.014101 | .000032  | -.000001 | .000000  |
| 330   | .000021  | .000000  | -.012374 | .000000  | -.000001 | .000000  |
| 331   | .000025  | .000005  | -.014101 | -.000032 | -.000001 | .000000  |
| 332   | .000039  | .000010  | -.019099 | -.000061 | -.000002 | -.000000 |
| 333   | .000071  | .000015  | -.026784 | -.000082 | -.000002 | -.000000 |
| 334   | .000063  | .000008  | -.026385 | .000079  | -.000001 | .000000  |
| 335   | .000043  | .000005  | -.018889 | .000060  | -.000001 | .000000  |
| 336   | .000031  | .000002  | -.013954 | .000032  | -.000001 | .000000  |
| 337   | .000028  | .000000  | -.012242 | .000000  | -.000001 | .000000  |
| 338   | .000031  | -.000002 | -.013954 | -.000032 | -.000001 | .000000  |
| 339   | .000043  | -.000005 | -.018889 | -.000060 | -.000001 | -.000000 |
| 340   | .000063  | -.000008 | -.026385 | -.000079 | -.000001 | -.000000 |
| 341   | .000041  | .000004  | -.026301 | .000080  | .000000  | -.000000 |
| 342   | .000045  | .000007  | -.018775 | .000060  | -.000000 | .000000  |
| 343   | .000035  | .000005  | -.013841 | .000032  | -.000001 | .000000  |
| 344   | .000031  | .000000  | -.012132 | .000000  | -.000001 | .000000  |
| 345   | .000035  | -.000005 | -.013841 | -.000032 | -.000001 | .000000  |
| 346   | .000045  | -.000007 | -.018775 | -.000060 | -.000000 | .000000  |
| 347   | .000041  | -.000004 | -.026301 | -.000080 | .000000  | .000000  |

***ANEJO 2C: TREN DE CARGAS Y SITUACIÓN DE APARATOS DE MEDIDA***

## PLANTA



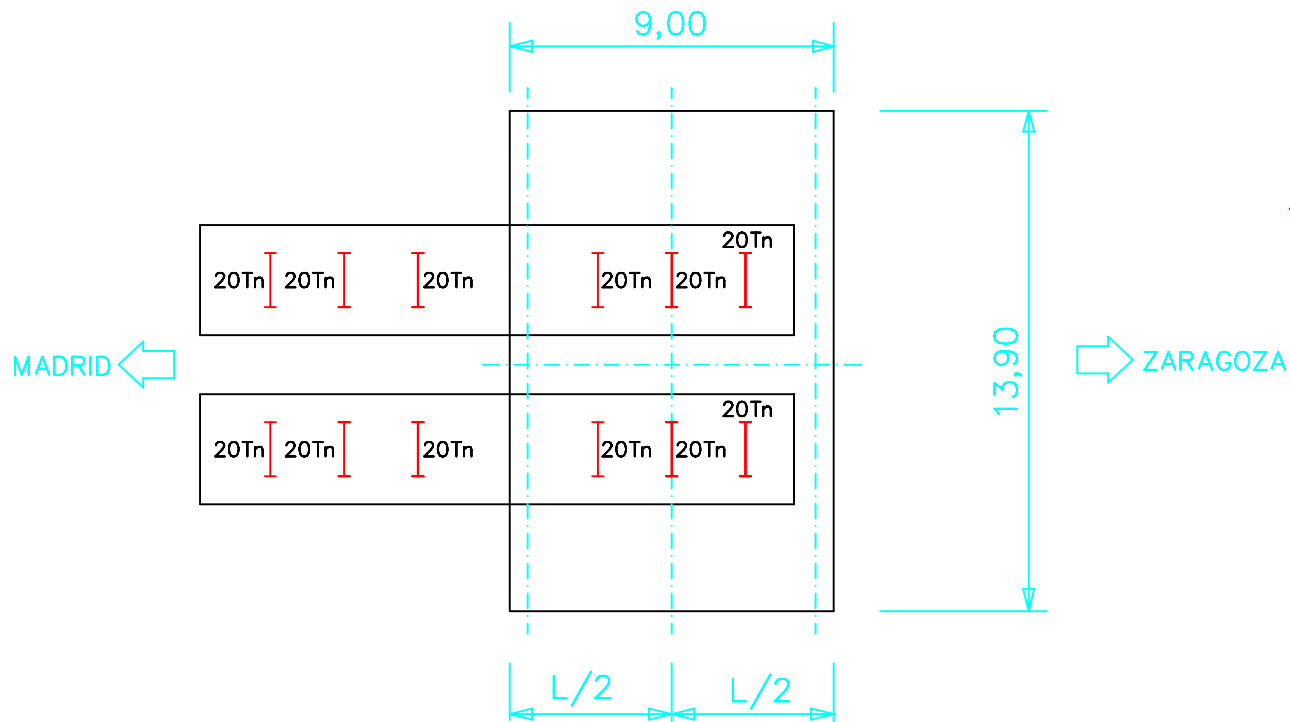
### LEYENDA.-

- TRANSDUCTOR DE DESPLAZAMIENTO.
- ⊗ ACELEROMETRO.
- ⊠ GALGAS EXTENSOMÉTRICAS

PASO INFERIOR TRAMO V<sub>d</sub>  
P.K. 513+360

SITUACION DE LOS  
PUNTOS DE MEDIDA

## PLANTA



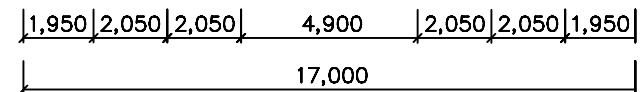
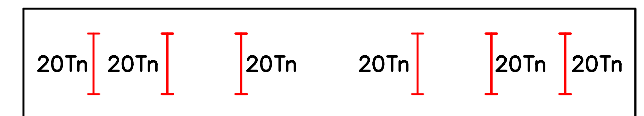
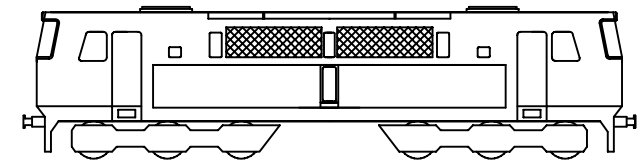
PRUEBA ESTÁTICA

## PRUEBAS DINÁMICAS.—

SE REALIZARÁN CON LOS DOS TRENES DE CARGA COMPLETOS (UNO POR CADA VÍA) LAS CUATRO PRUEBAS DINÁMICAS

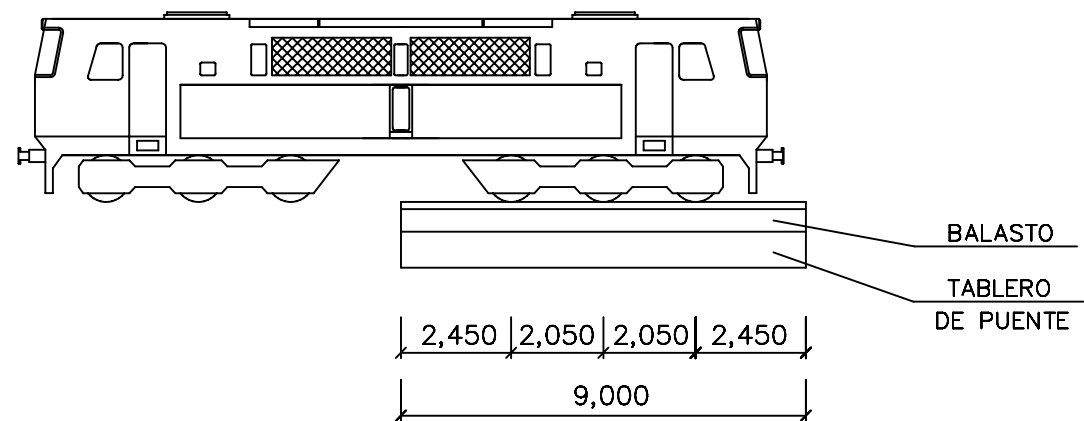
- A) PASO DE TREN A 5 Km/h.
- B) PASO DE TREN A VELOCIDAD MEDIA ENTRE 5 Y LA MÁXIMA VELOCIDAD COMPATIBLE CON LA SEGURIDAD.
- C) PASO DE TREN A LA VELOCIDAD MÁXIMA COMPATIBLE CON LA SEGURIDAD
- D) FRENADO A LA VELOCIDAD MÁXIMA COMPATIBLE CON LA SEGURIDAD

## LOCOMOTORA SERIE 060 (BRIHUEGA Y MADRID SUR)



PASO INFERIOR TRAMO  $V_d$   
P.K. 513+360

SITUACION DE LAS  
CARGAS DE PRUEBA



LOCOMOTORA SERIE 060 (BRIHUEGA Y MADRID SUR) + TOLVA GIF

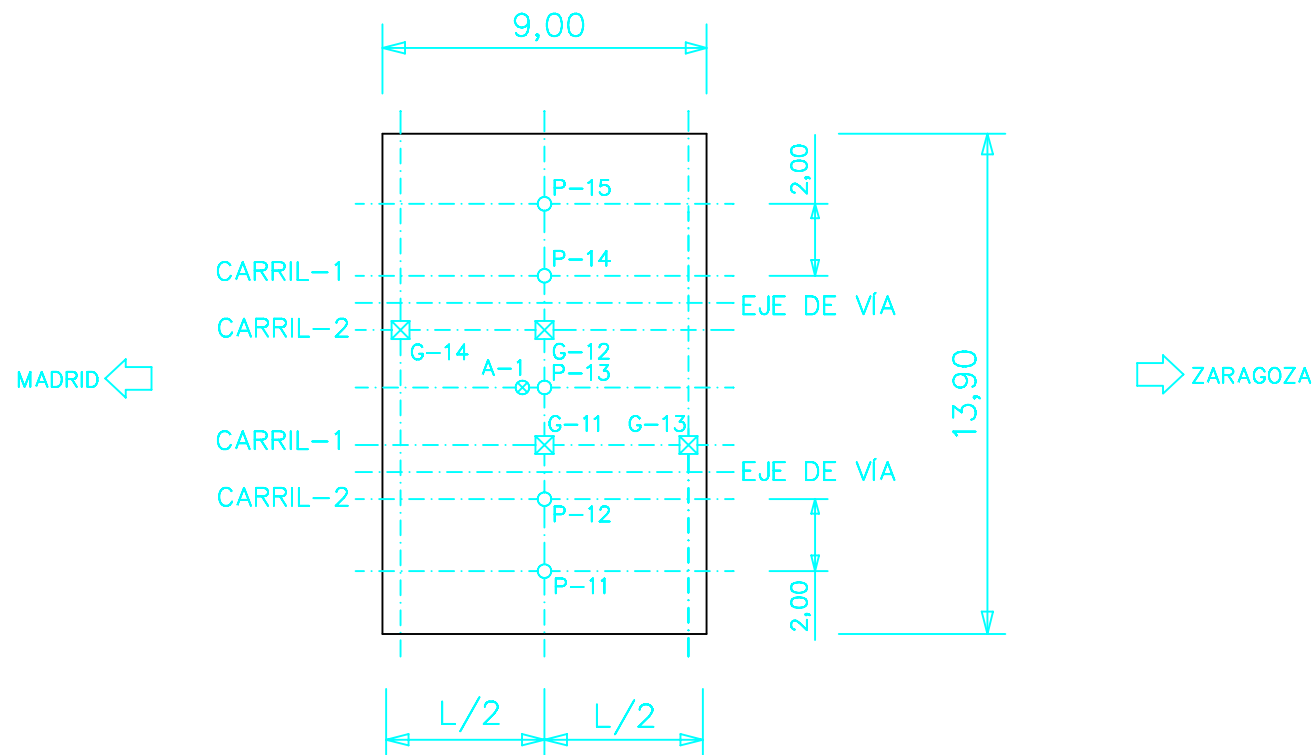
PASO INFERIOR TRAMO Va  
P.K. 513+360

POSICIÓN DE LOS TRENES DE CARGA  
SOBRE EL TABLERO

**ANEJO 3: ESQUEMA DE INSTRUMENTACIÓN Y TREN  
DE CARGA**

Madrid, Diciembre de 2002

## PLANTA



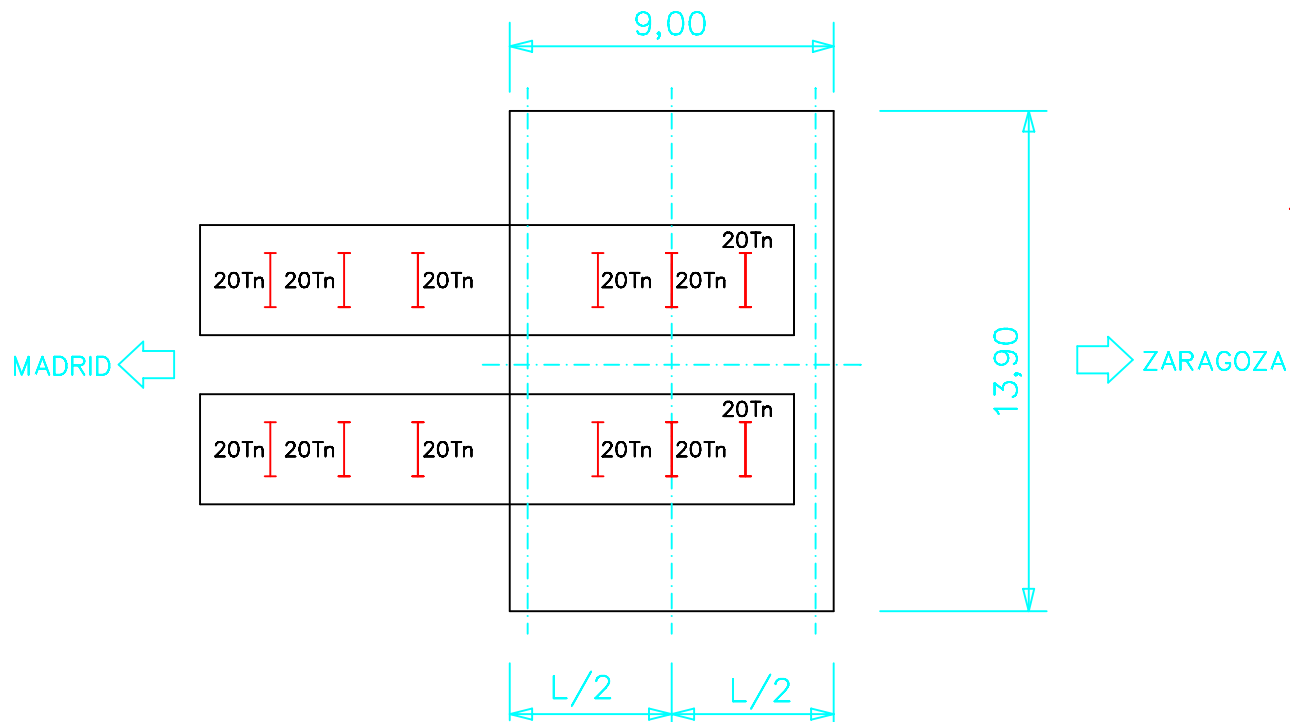
### LEYENDA.-

- TRANSDUCTOR DE DESPLAZAMIENTO.
- ⊗ ACELEROMETRO.
- ⊠ GALGAS EXTENSOMÉTRICAS

PASO INFERIOR TRAMO V<sub>d</sub>  
P.K. 513+360

SITUACION DE LOS  
PUNTOS DE MEDIDA

## PLANTA



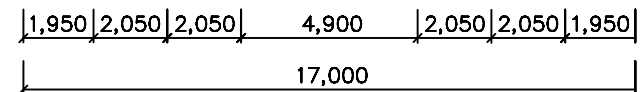
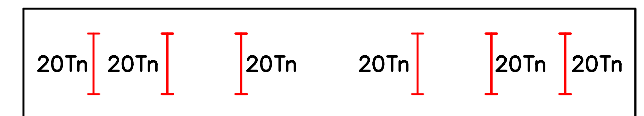
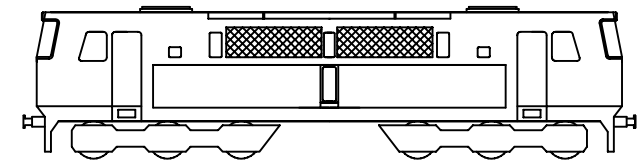
PRUEBA ESTÁTICA

## PRUEBAS DINÁMICAS.—

SE REALIZARÁN CON LOS DOS TRENES DE CARGA COMPLETOS (UNO POR CADA VÍA) LAS CUATRO PRUEBAS DINÁMICAS

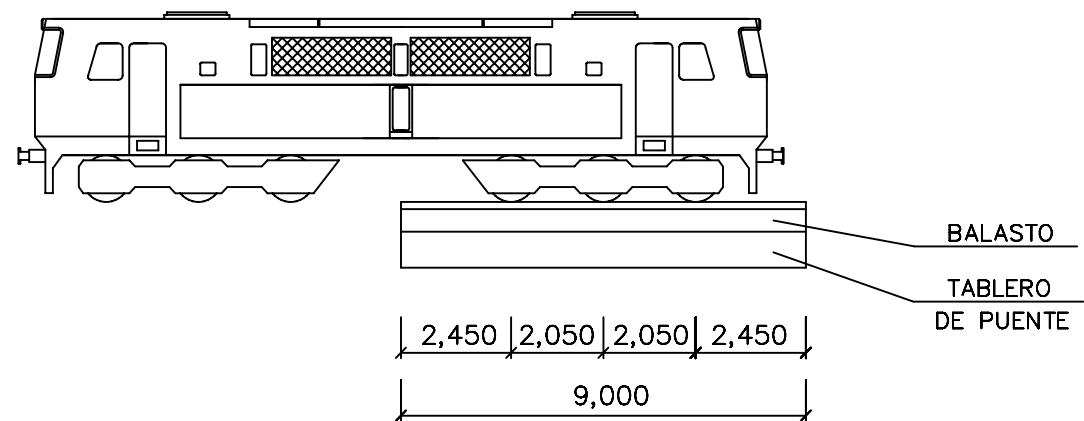
- A) PASO DE TREN A 5 Km/h.
- B) PASO DE TREN A VELOCIDAD MEDIA ENTRE 5 Y LA MÁXIMA VELOCIDAD COMPATIBLE CON LA SEGURIDAD.
- C) PASO DE TREN A LA VELOCIDAD MÁXIMA COMPATIBLE CON LA SEGURIDAD
- D) FRENADO A LA VELOCIDAD MÁXIMA COMPATIBLE CON LA SEGURIDAD

## LOCOMOTORA SERIE 060 (BRIHUEGA Y MADRID SUR)



PASO INFERIOR TRAMO  $V_d$   
P.K. 513+360

SITUACION DE LAS  
CARGAS DE PRUEBA



LOCOMOTORA SERIE 060 (BRIHUEGA Y MADRID SUR) + TOLVA GIF

PASO INFERIOR TRAMO Va  
P.K. 513+360

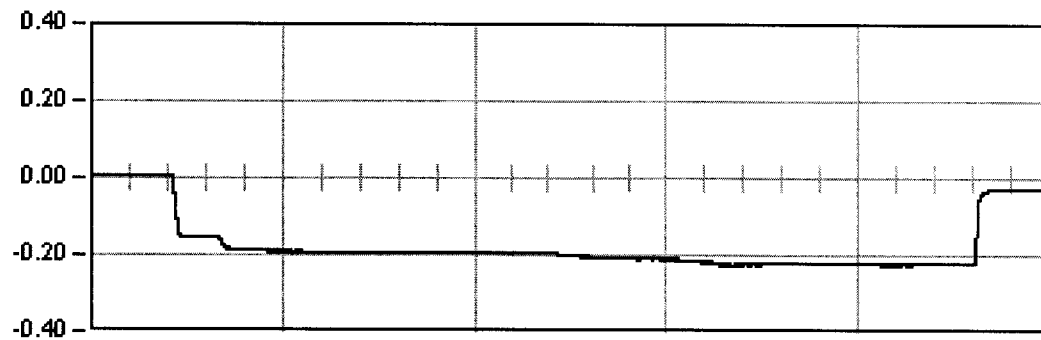
POSICIÓN DE LOS TRENES DE CARGA  
SOBRE EL TABLERO

**ANEJO 4: REGISTRO DE MEDIDAS**

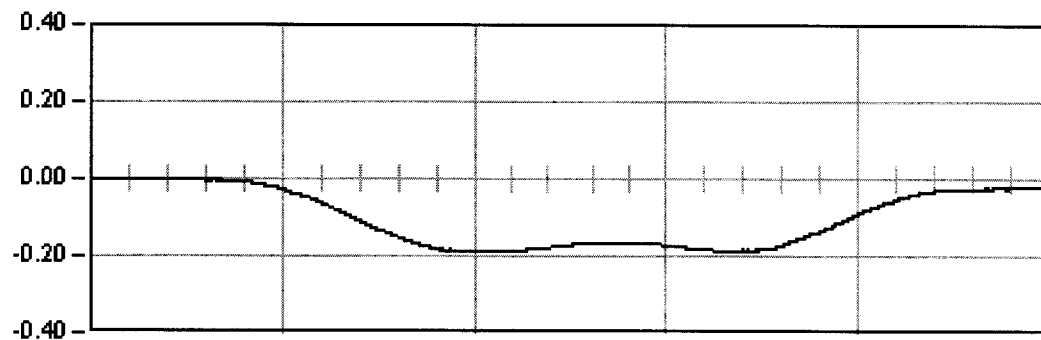
Madrid, Diciembre de 2002

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P11    Canal : 01    Unidades : mm



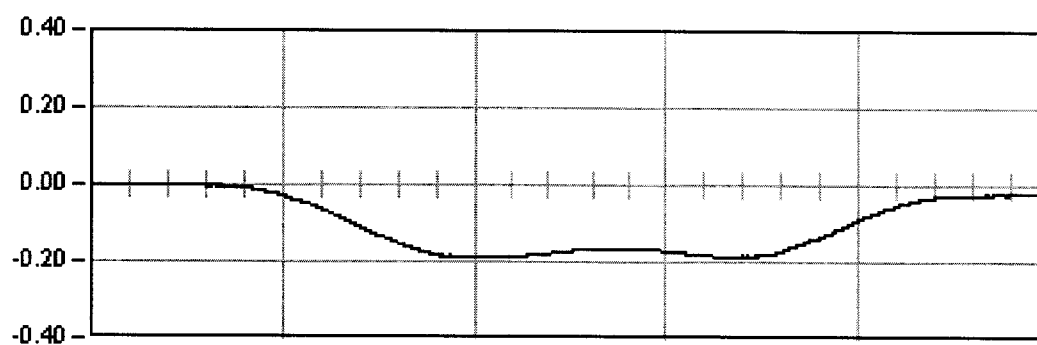
ESTATICA 01  
899.0    Seg  
Est:    -0.23  
Max:    -0.23  
Min:    0.01  
Rem:    -0.03



DINAMICA 01  
25.0    Seg  
Max:    -0.19  
Min:    0.00  
Rem:    -0.02

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P11    Canal : 01    Unidades : mm



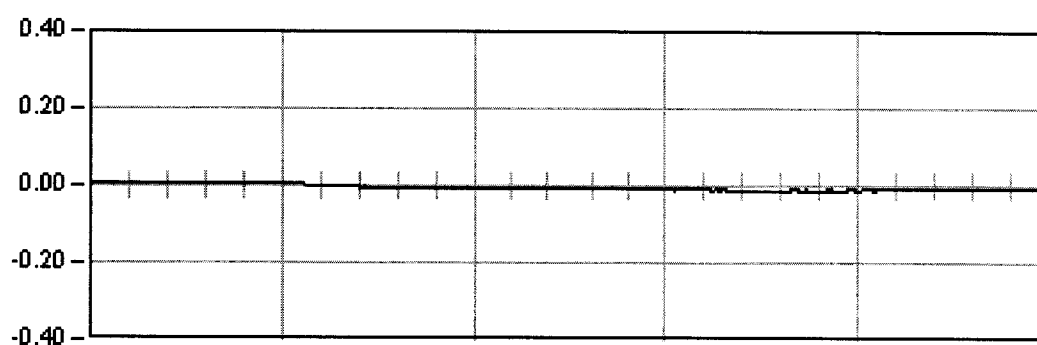
DYNAMICA 01

25.0    Seg

Max:    -0.19

Min:    0.00

Rem:    -0.02



DYNAMICA 21

19.3    Seg

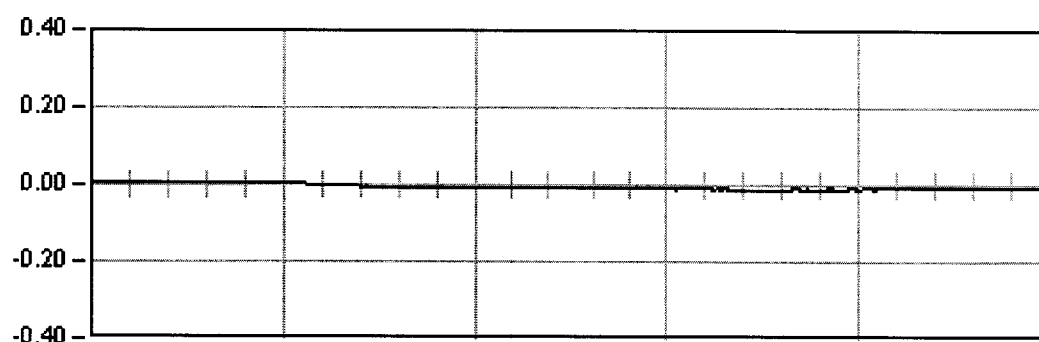
Max:    -0.01

Min:    0.01

Rem:    -0.00

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P11 Canal : 01 Unidades : mm



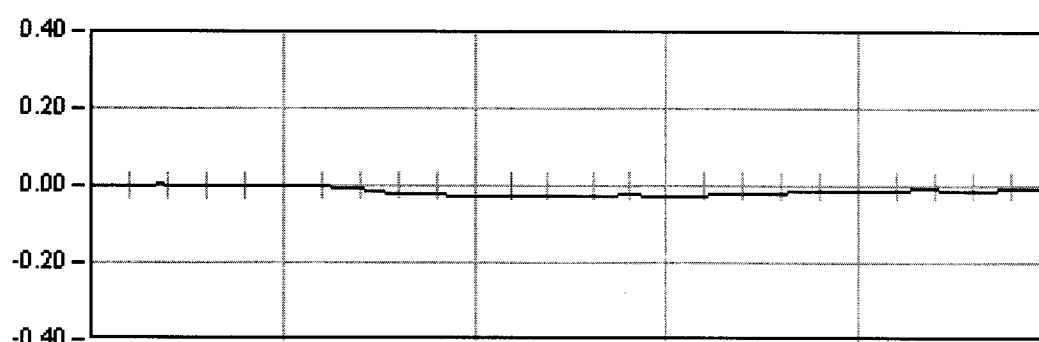
DYNAMICA 21

19.3 Seg

Max: -0.01

Min: 0.01

Rem: -0.00



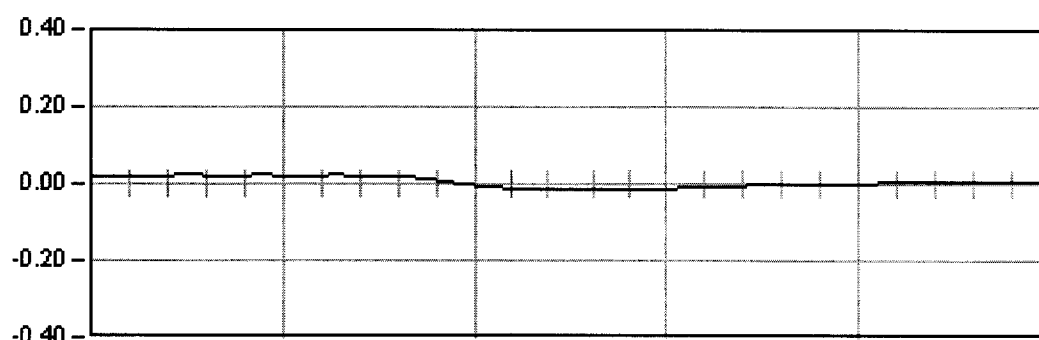
DYNAMICA 22

3.0 Seg

Max: -0.02

Min: 0.01

Rem: -0.01



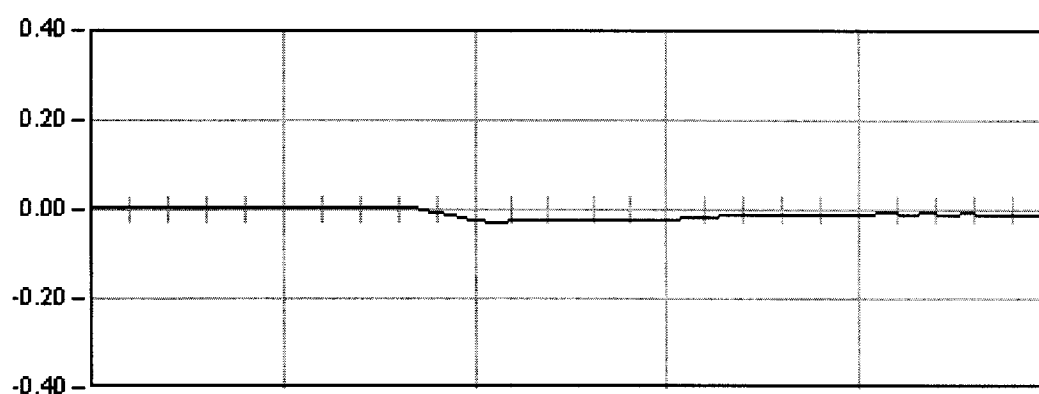
DYNAMICA 23

2.8 Seg

Max: 0.02

Min: -0.02

Rem: -0.02



DYNAMICA 24

3.2 Seg

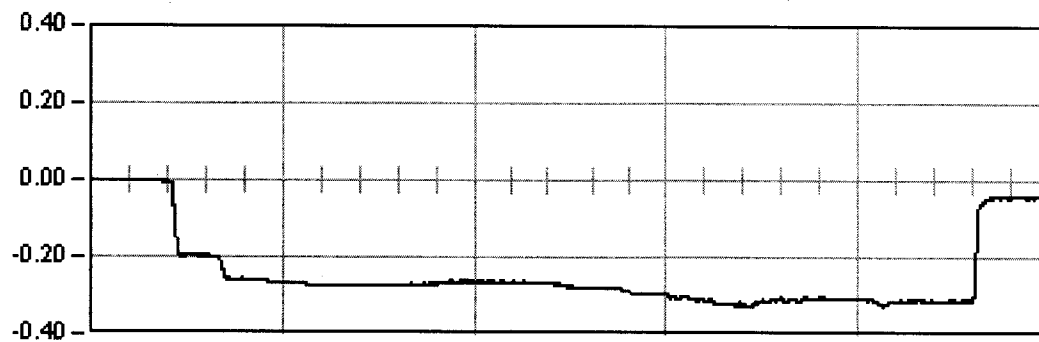
Max: -0.03

Min: 0.01

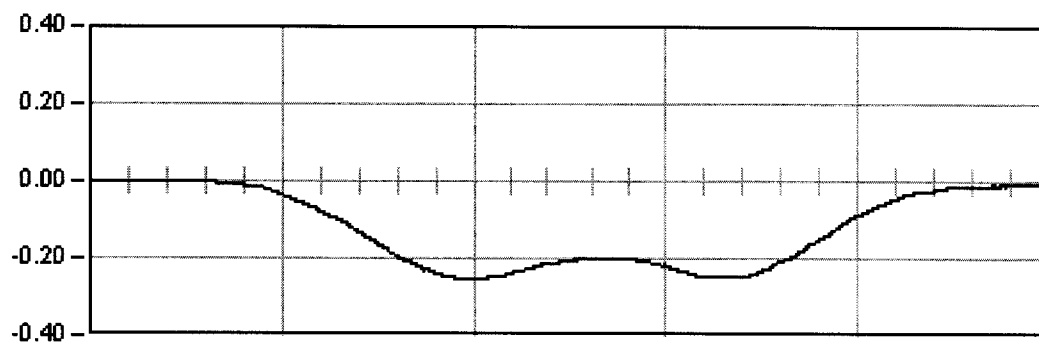
Rem: -0.01

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P12    Canal : 03    Unidades : mm



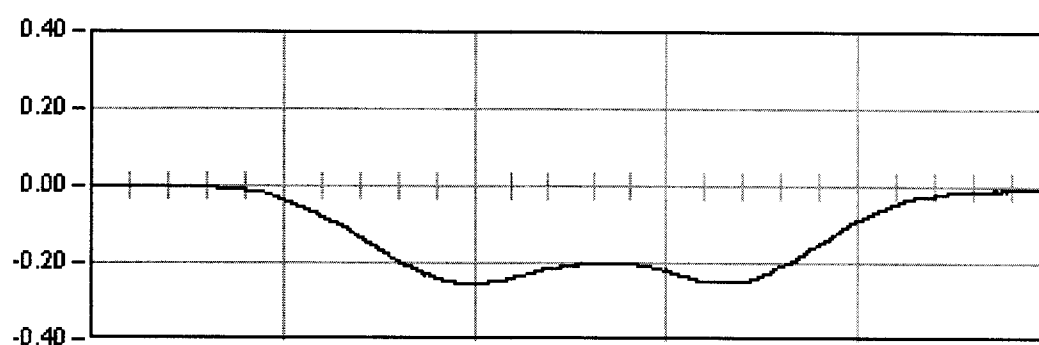
ESTATICA 01  
899.0    Seg  
Est:    -0.31  
Max:    -0.33  
Min:    0.00  
Rem:    -0.04



DINAMICA 01  
25.0    Seg  
Max:    -0.25  
Min:    0.01  
Rem:    -0.01

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P12    Canal : 03    Unidades : mm



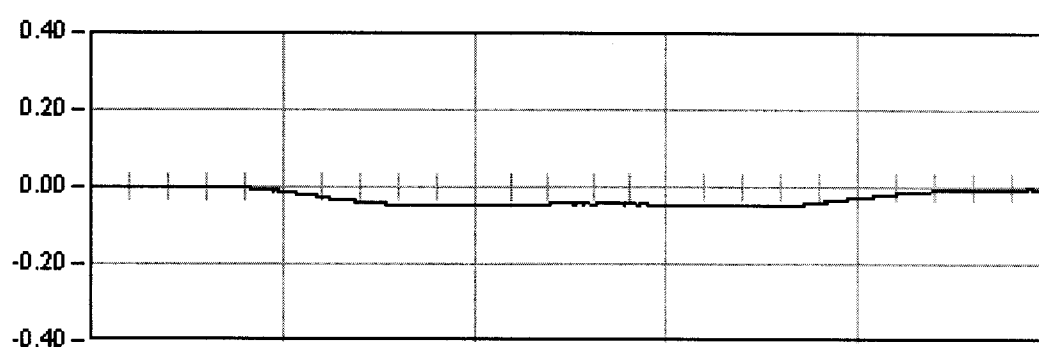
DYNAMICA 01

25.0    Seg

Max:    -0.25

Min:    0.01

Rem:    -0.01



DYNAMICA 21

19.3    Seg

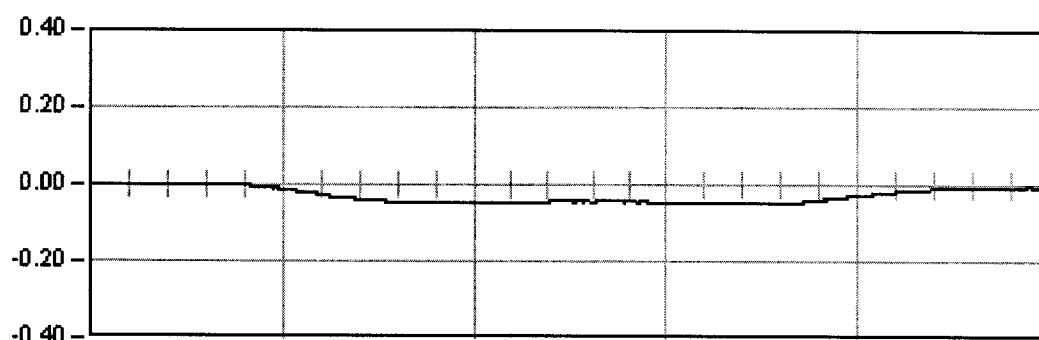
Max:    -0.05

Min:    0.00

Rem:    -0.00

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P12 Canal : 03 Unidades : mm



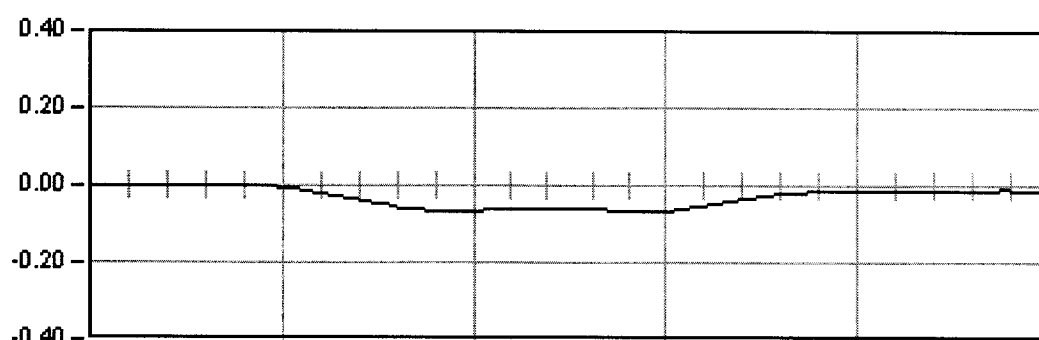
DYNAMICA 21

19.3 Seg

Max: -0.05

Min: 0.00

Rem: -0.00



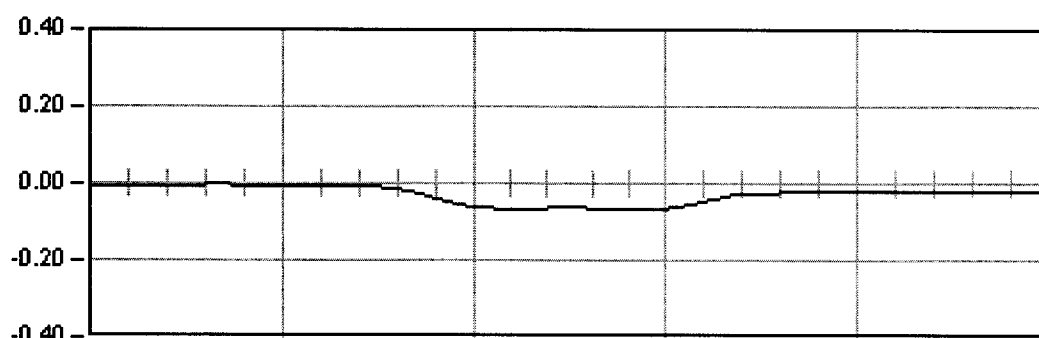
DYNAMICA 22

3.0 Seg

Max: -0.07

Min: 0.00

Rem: -0.01



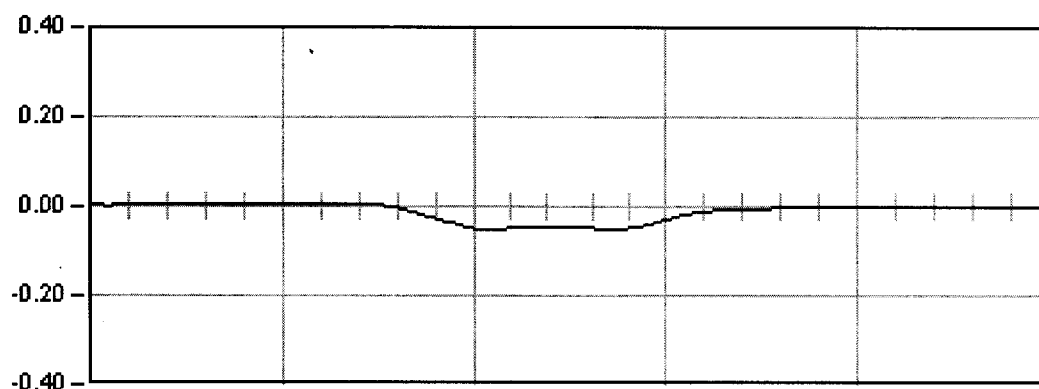
DYNAMICA 23

2.8 Seg

Max: -0.07

Min: -0.00

Rem: -0.02



DYNAMICA 24

3.2 Seg

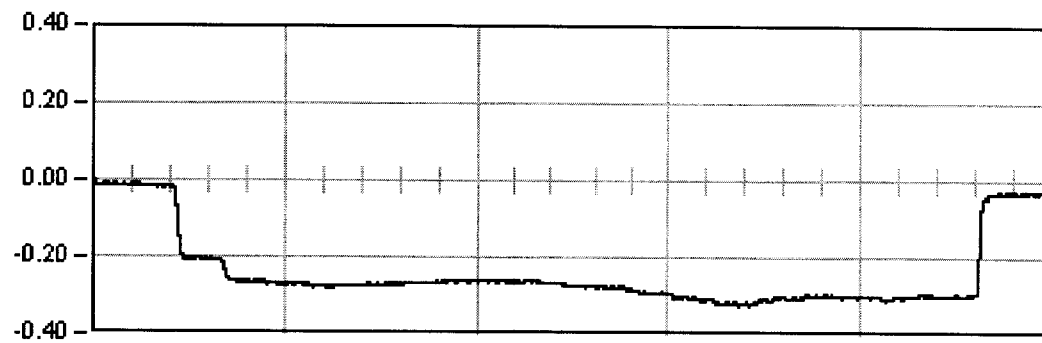
Max: -0.05

Min: 0.01

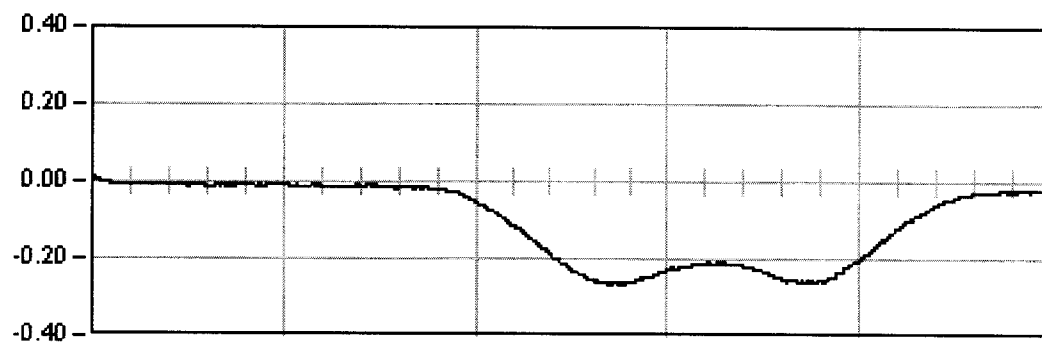
Rem: 0.00

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P13    Canal : 04    Unidades : mm



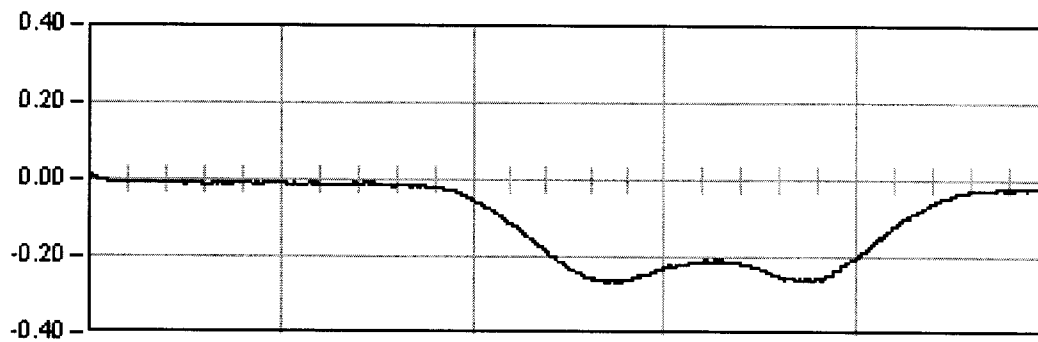
ESTATICA 01  
899.0    Seg  
Est:    -0.30  
Max:    -0.32  
Min:    0.06  
Rem:    -0.03



DINAMICA 01  
33.0    Seg  
Max:    -0.27  
Min:    0.01  
Rem:    -0.02

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P13    Canal : 04    Unidades : mm



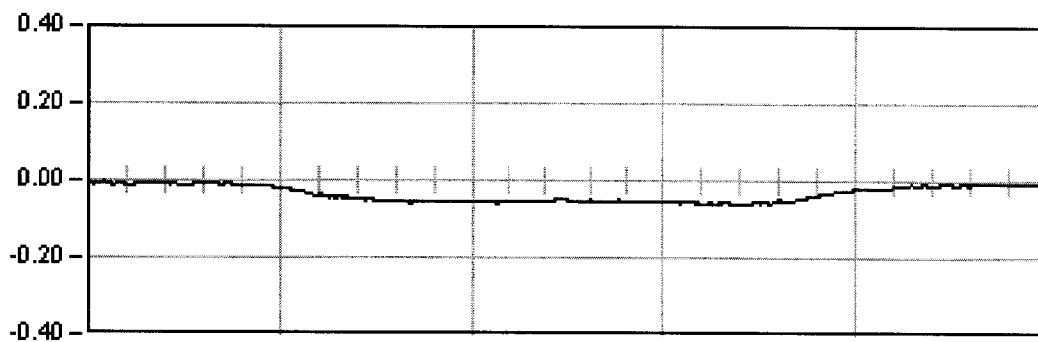
DINAMICA 01

33.0    Seg

Max:    -0.27

Min:    0.01

Rem:    -0.02



DINAMICA 21

19.8    Seg

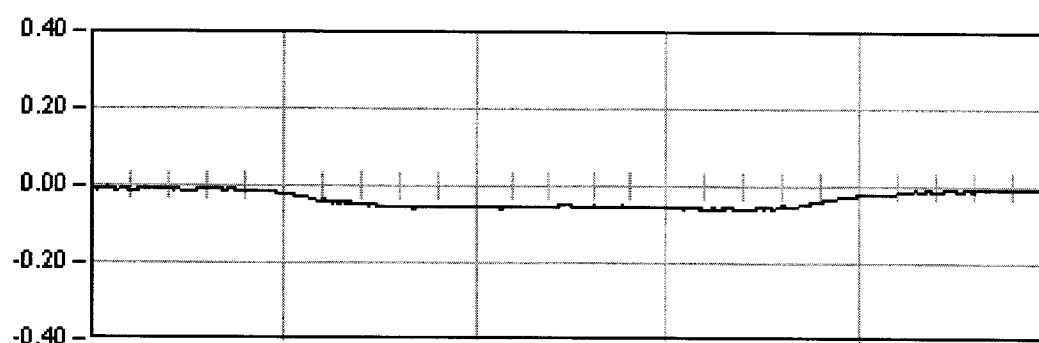
Max:    -0.06

Min:    0.00

Rem:    -0.01

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P13 Canal : 04 Unidades : mm



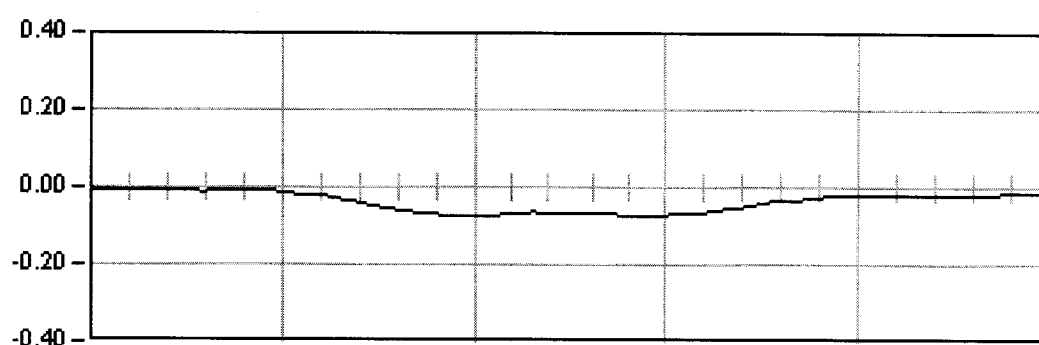
DYNAMICA 21

19.8 Seg

Max: -0.06

Min: 0.00

Rem: -0.01



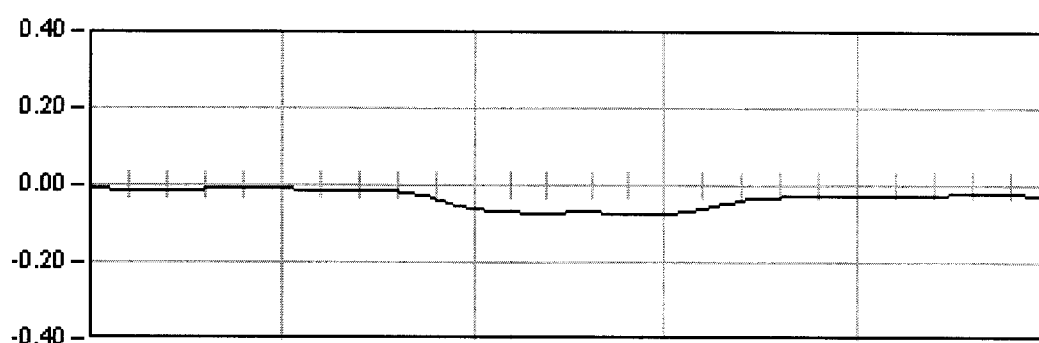
DYNAMICA 22

3.0 Seg

Max: -0.07

Min: 0.00

Rem: -0.01



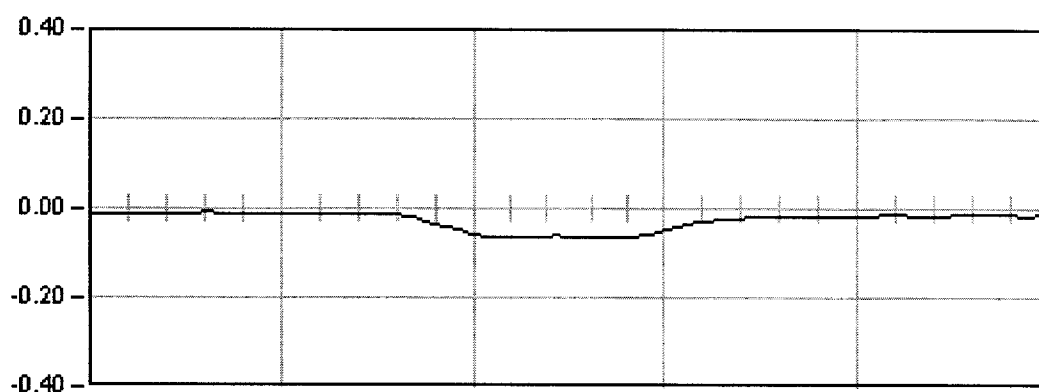
DYNAMICA 23

2.8 Seg

Max: -0.07

Min: 0.01

Rem: -0.02



DYNAMICA 24

3.2 Seg

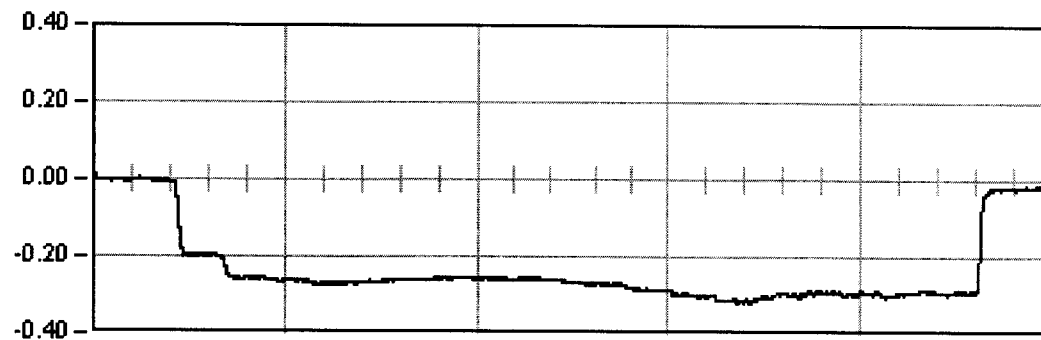
Max: -0.06

Min: -0.00

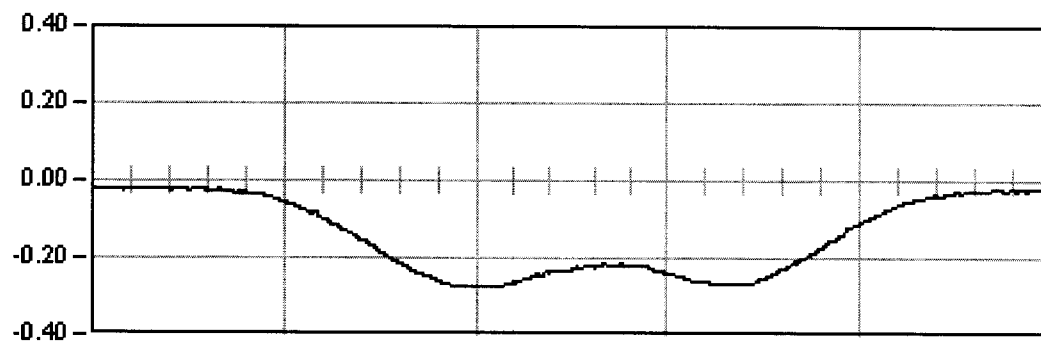
Rem: -0.01

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P14    Canal : 05    Unidades : mm



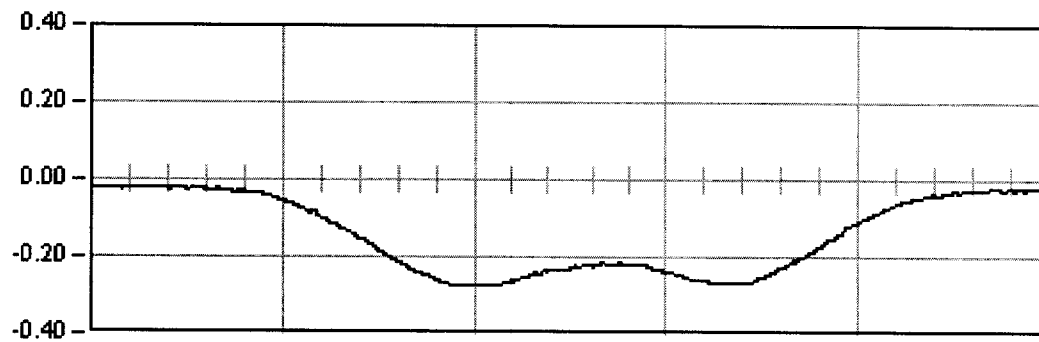
ESTATICA 01  
899.0    Seg  
Est:    -0.29  
Max:    -0.32  
Min:    0.02  
Rem:    -0.02



DINAMICA 01  
25.0    Seg  
Max:    -0.28  
Min:    0.00  
Rem:    -0.02

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P14    Canal : 05    Unidades : mm



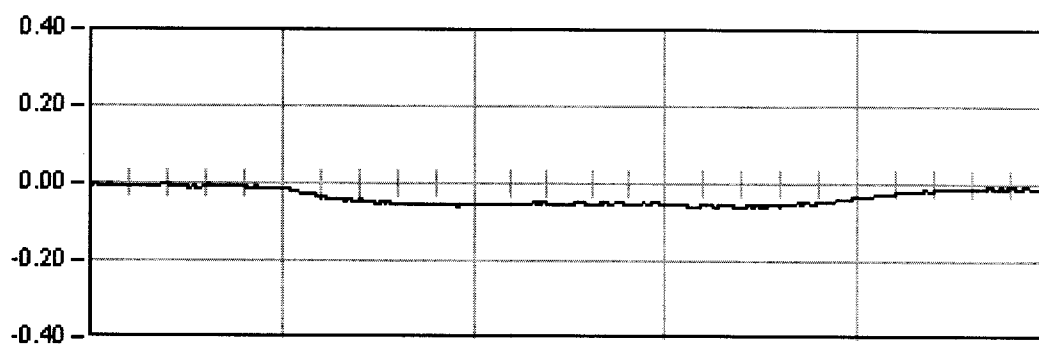
DINAMICA 01

25.0    Seg

Max:    -0.28

Min:    0.00

Rem:    -0.02



DINAMICA 21

19.3    Seg

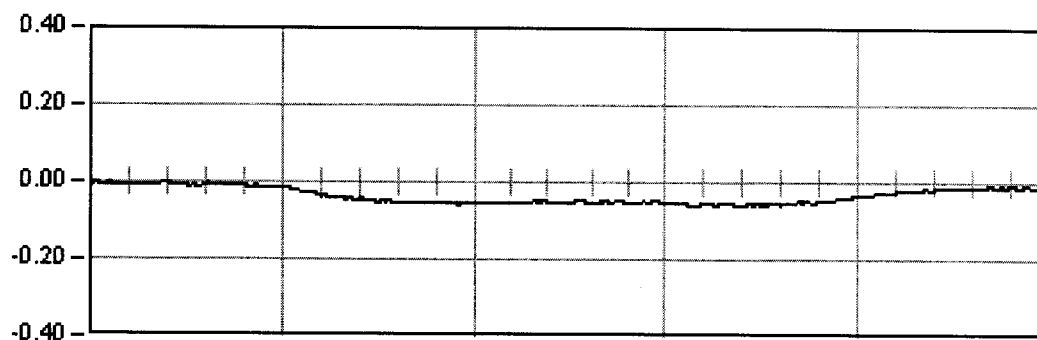
Max:    -0.06

Min:    0.01

Rem:    -0.01

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P14    Canal : 05    Unidades : mm



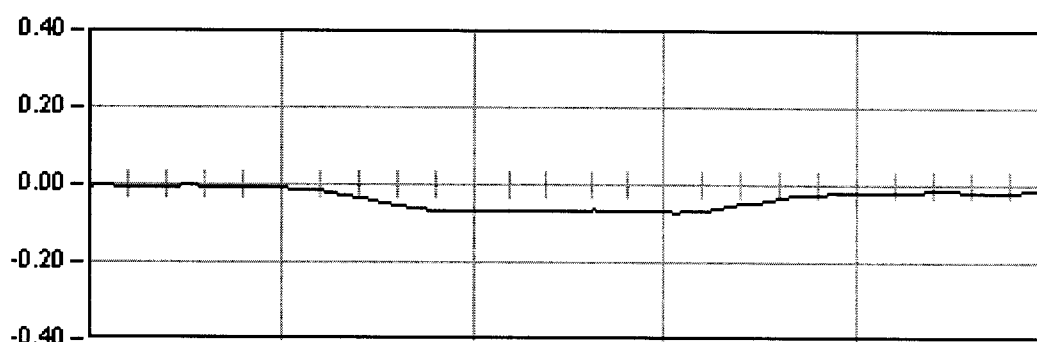
DYNAMICA 21

19.3    Seg

Max:    -0.06

Min:    0.01

Rem:    -0.01



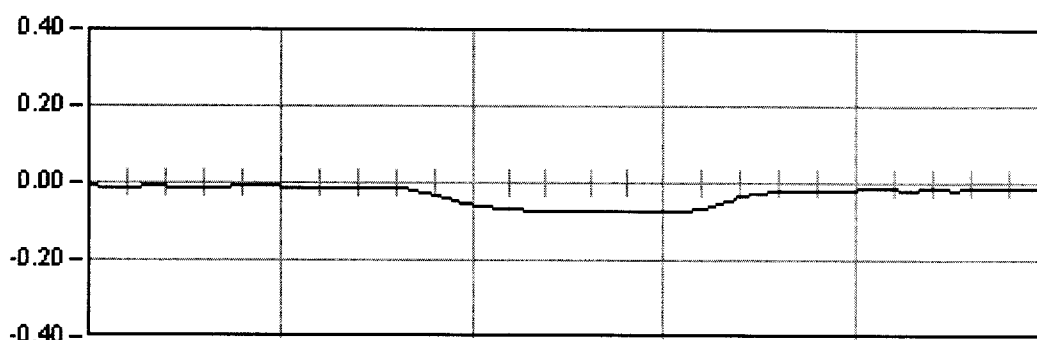
DYNAMICA 22

3.0    Seg

Max:    -0.07

Min:    0.00

Rem:    -0.01



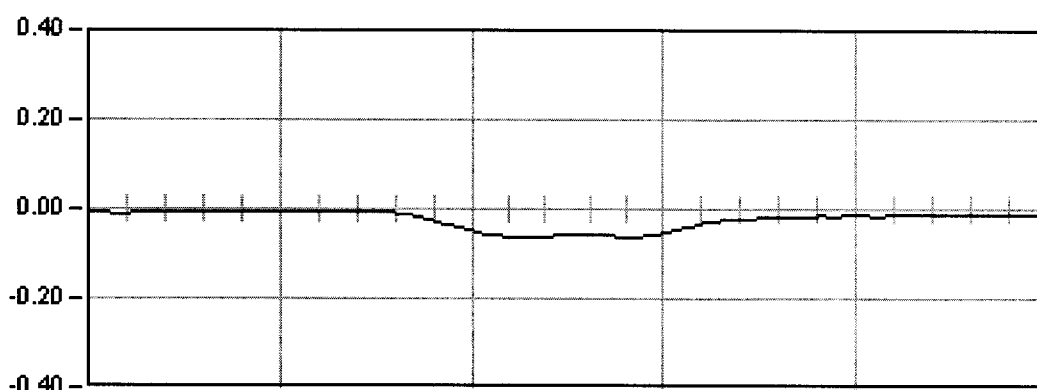
DYNAMICA 23

2.8    Seg

Max:    -0.07

Min:    0.01

Rem:    -0.02



DYNAMICA 24

3.2    Seg

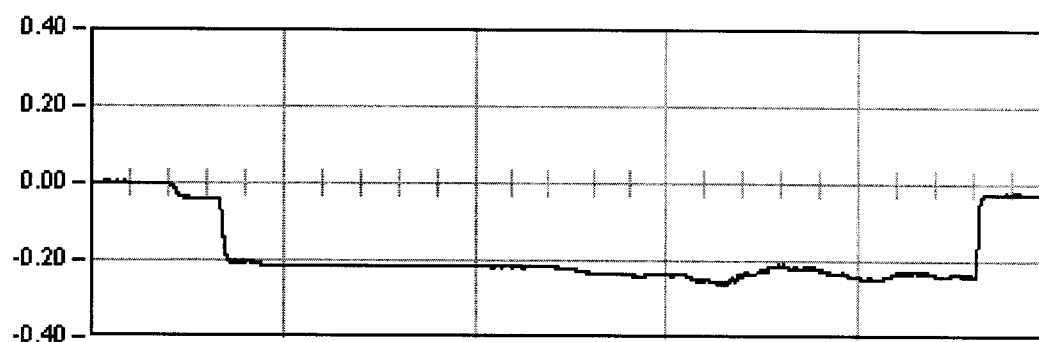
Max:    -0.06

Min:    0.01

Rem:    -0.01

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P15    Canal : 09    Unidades : mm



ESTATICA 01

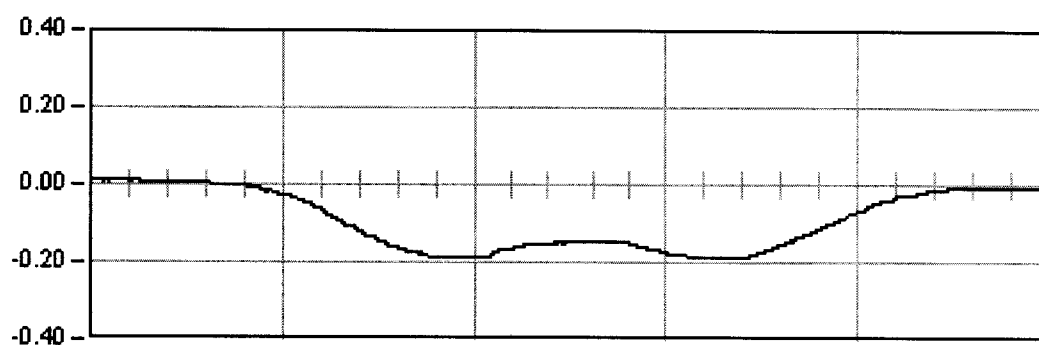
899.0    Seg

Est:    -0.24

Max:    -0.26

Min:    0.00

Rem:    -0.02



DINAMICA 01

25.0    Seg

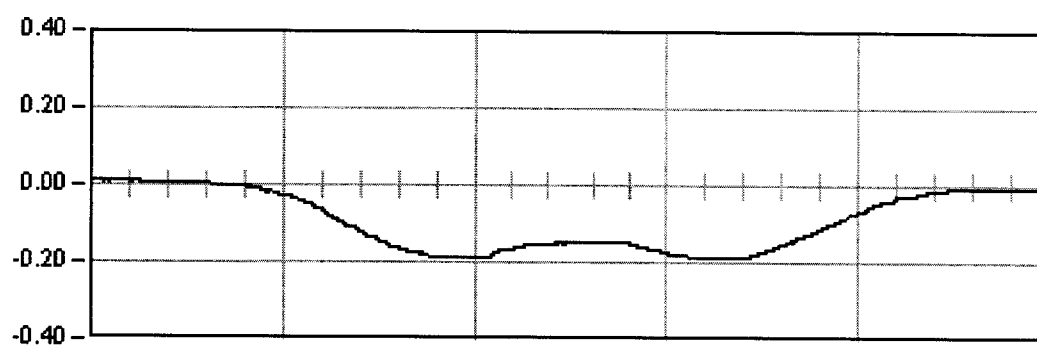
Max:    -0.19

Min:    0.02

Rem:    -0.01

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P15    Canal : 09    Unidades : mm



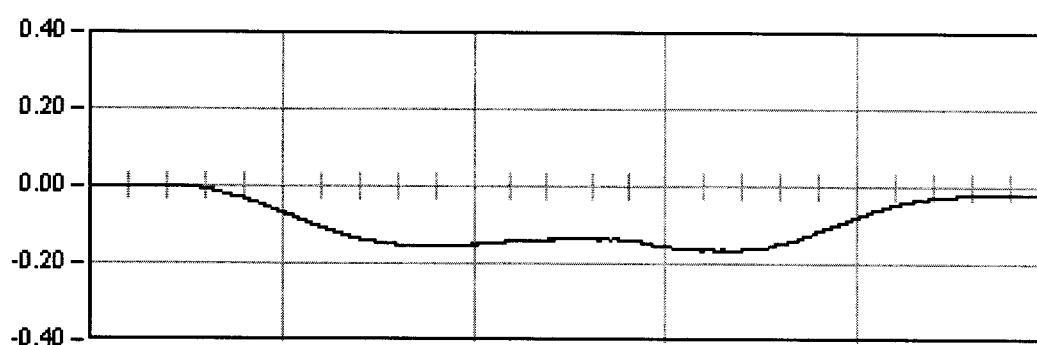
DYNAMICA 01

25.0    Seg

Max:    -0.19

Min:    0.02

Rem:    -0.01



DYNAMICA 21

19.3    Seg

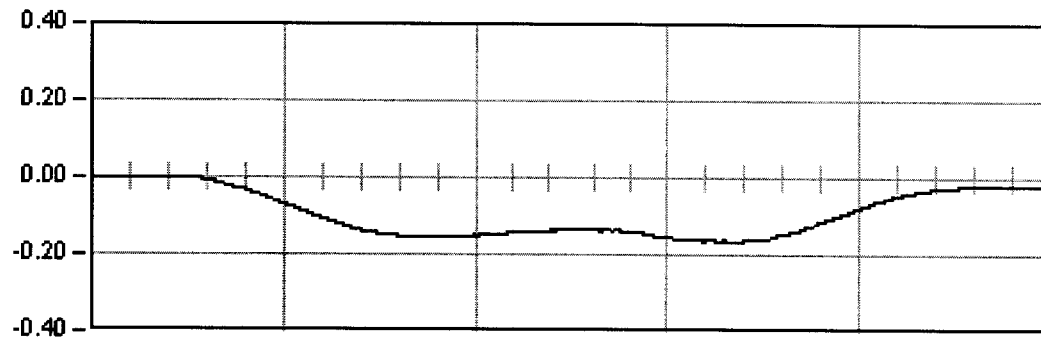
Max:    -0.17

Min:    0.00

Rem:    -0.02

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : P15    Canal : 09    Unidades : mm



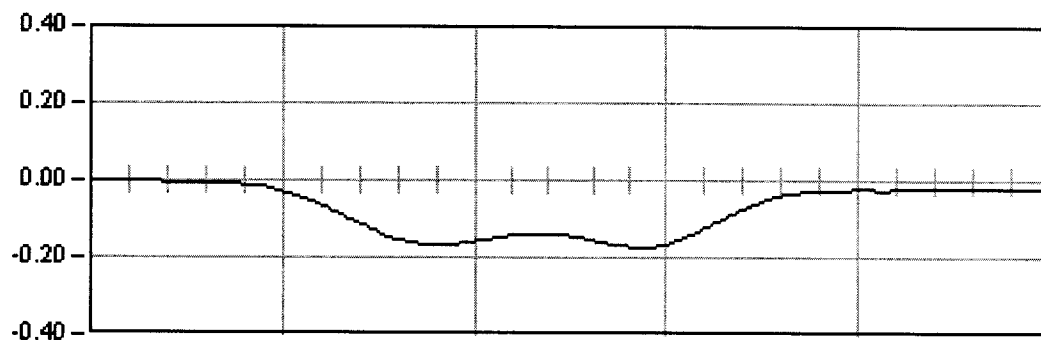
DYNAMICA 21

19.3    Seg

Max:    -0.17

Min:    0.00

Rem:    -0.02



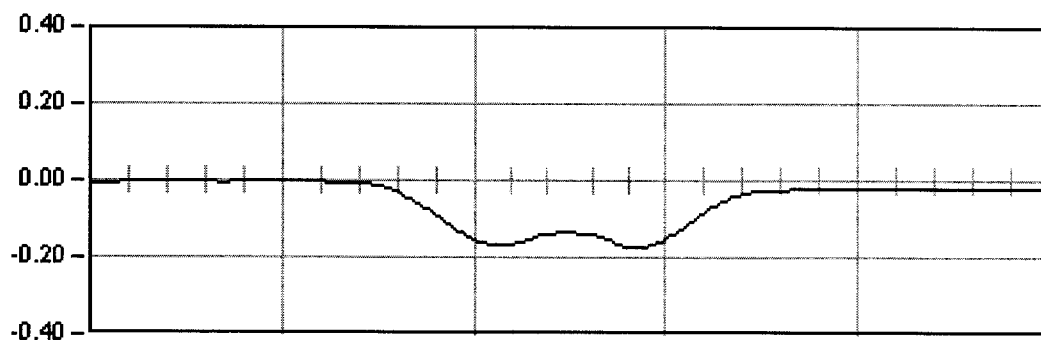
DYNAMICA 22

3.0    Seg

Max:    -0.17

Min:    0.00

Rem:    -0.02



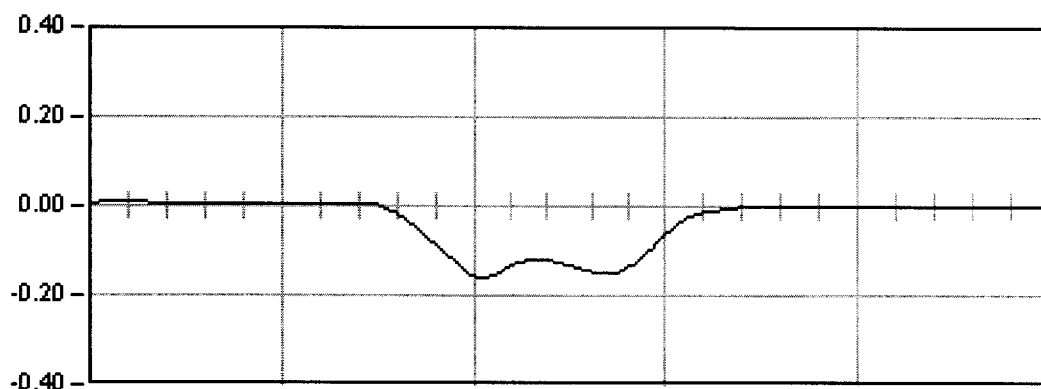
DYNAMICA 23

2.8    Seg

Max:    -0.18

Min:    0.00

Rem:    -0.01



DYNAMICA 24

3.2    Seg

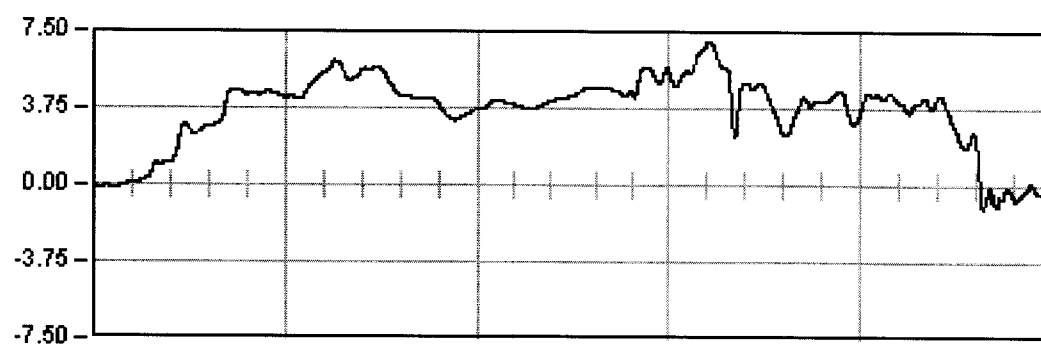
Max:    -0.16

Min:    0.01

Rem:    0.00

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : G11    Canal : 34    Unidades :  $\mu\text{E}$



ESTATICA 01

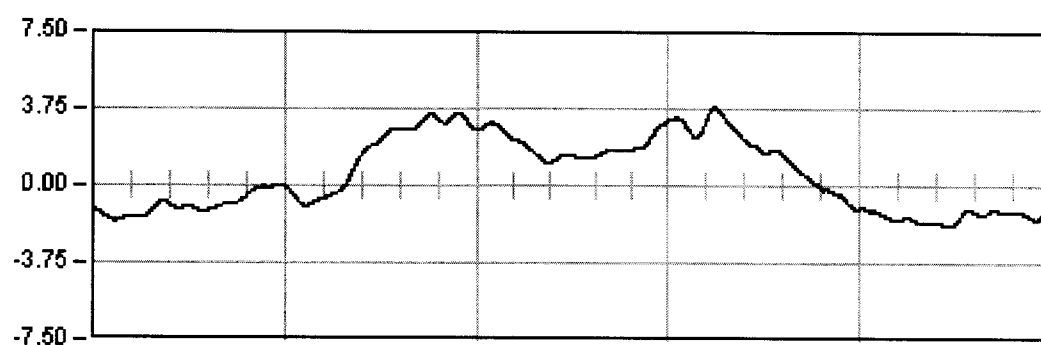
899.0    Seg

Est:    3.05

Max:    7.04

Min:    -1.09

Rem:    -0.37



DINAMICA 01

25.0    Seg

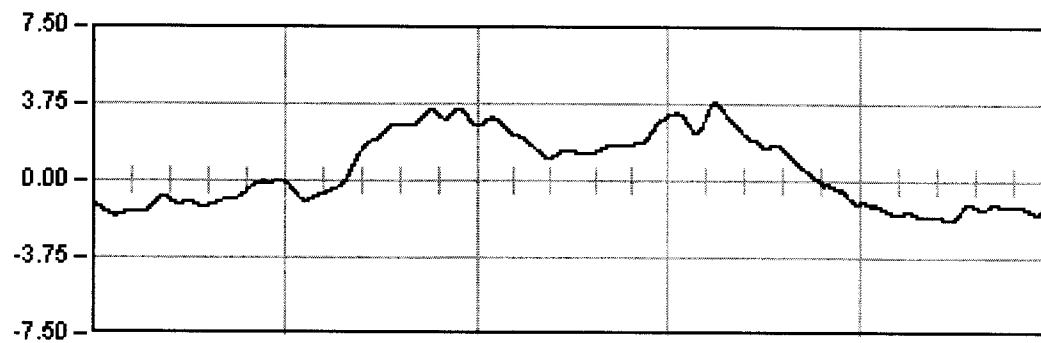
Max:    3.82

Min:    -2.89

Rem:    -1.24

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : G11    Canal : 34    Unidades :  $\mu\text{E}$



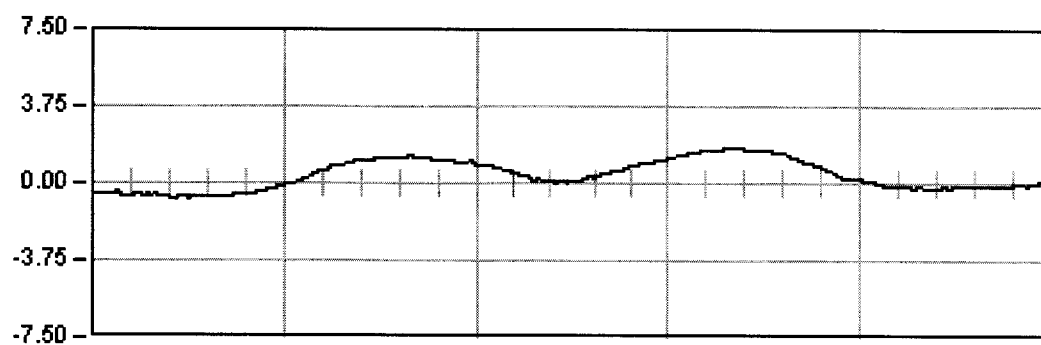
DINAMICA 01

25.0    Seg

Max:    3.82

Min:    -2.89

Rem:    -1.24



DINAMICA 21

19.3    Seg

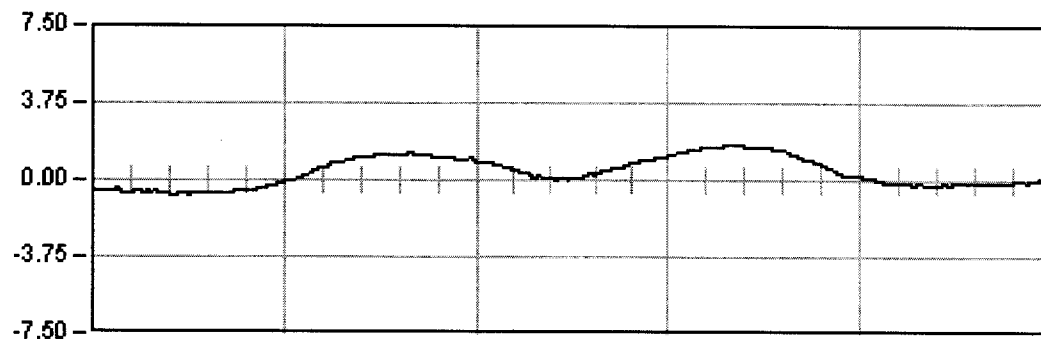
Max:    1.75

Min:    -0.73

Rem:    0.04

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : G11    Canal : 34    Unidades :  $\mu E$



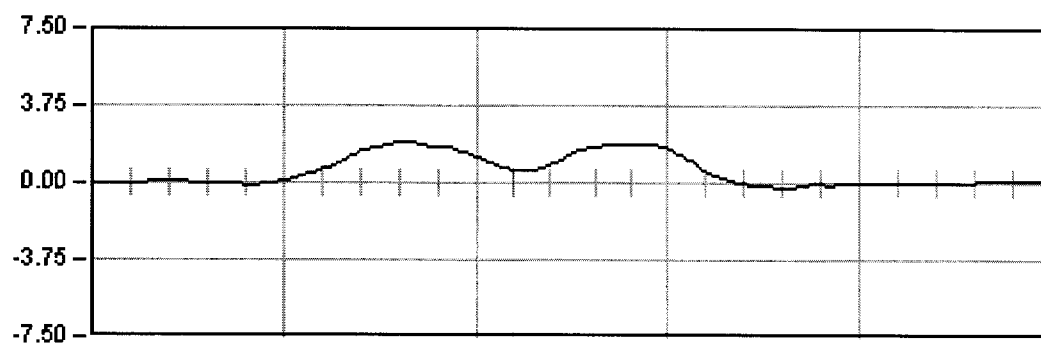
DINAMICA 21

19.3    Seg

Max:    1.75

Min:    -0.73

Rem:    0.04



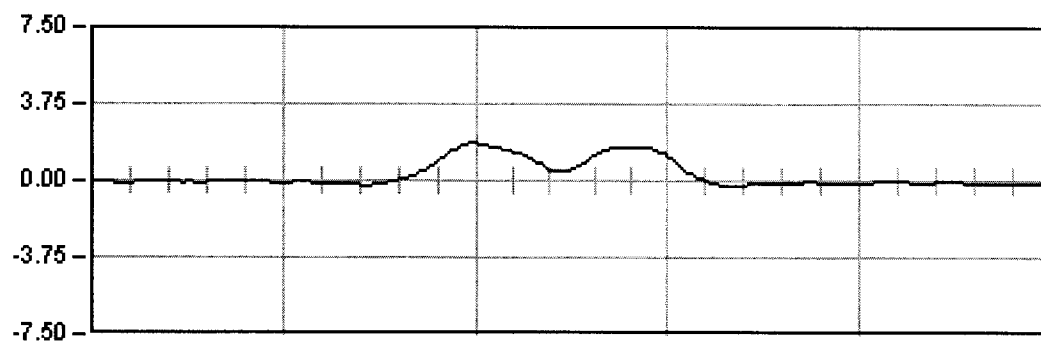
DINAMICA 22

3.0    Seg

Max:    2.04

Min:    -0.25

Rem:    0.13



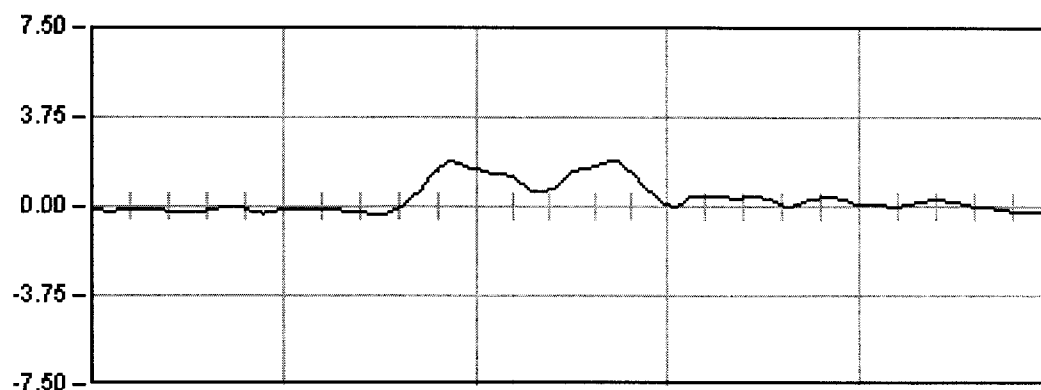
DINAMICA 23

2.8    Seg

Max:    1.83

Min:    -0.36

Rem:    -0.07



DINAMICA 24

3.2    Seg

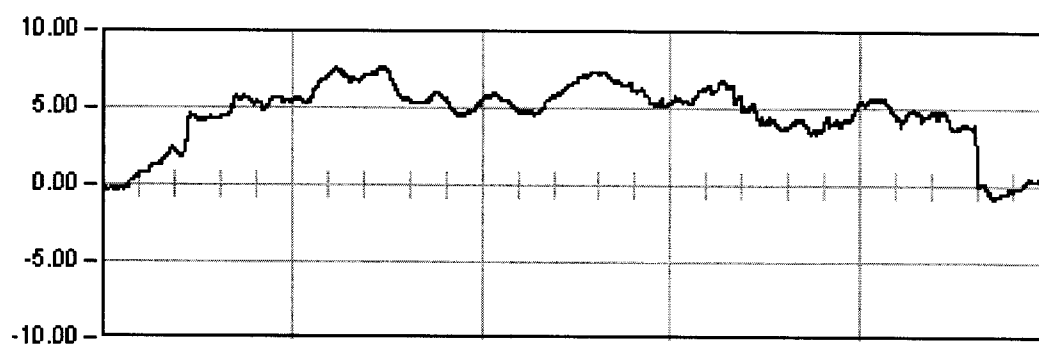
Max:    1.93

Min:    -0.39

Rem:    0.73

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : G12    Canal : 38    Unidades :  $\mu\text{E}$



ESTATICA 01

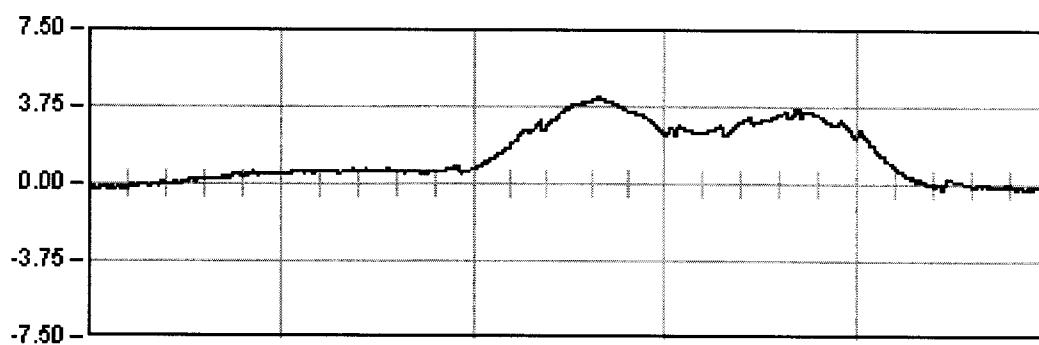
899.0    Seg

Est:    3.91

Max:    7.63

Min:    -0.79

Rem:    -0.05



DINAMICA 01

33.0    Seg

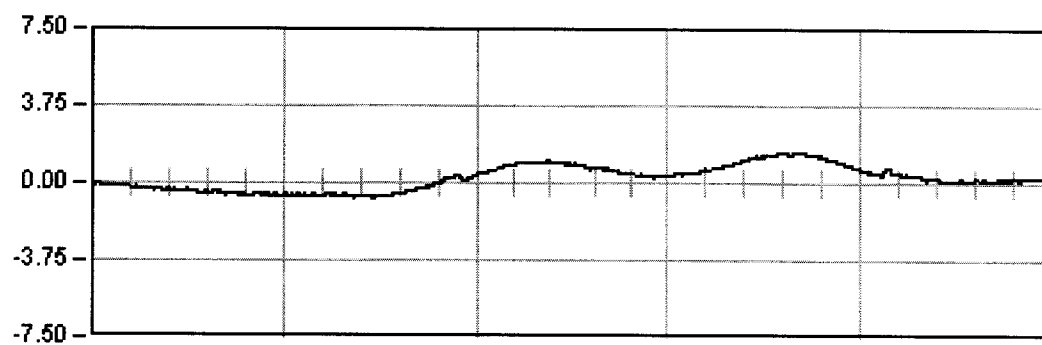
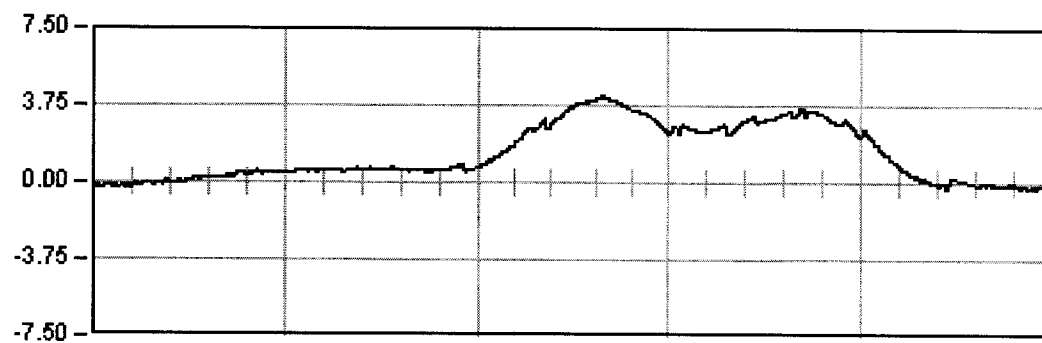
Max:    4.20

Min:    -0.26

Rem:    -0.13

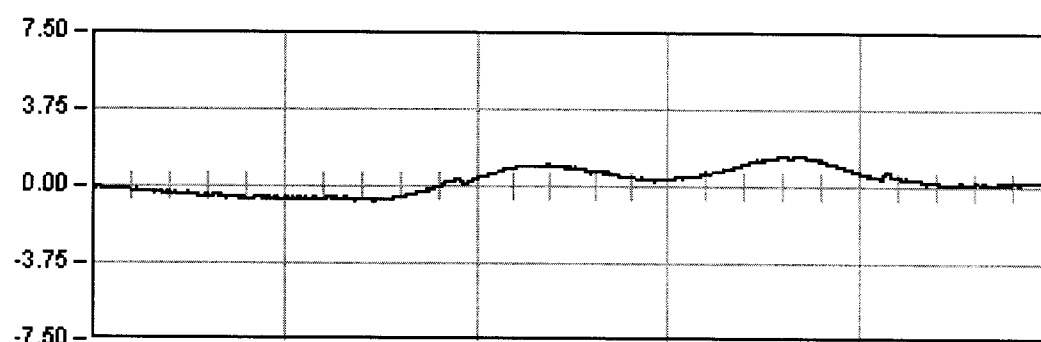
06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : G12    Canal : 38    Unidades :  $\mu E$



06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : G12 Canal : 38 Unidades :  $\mu E$



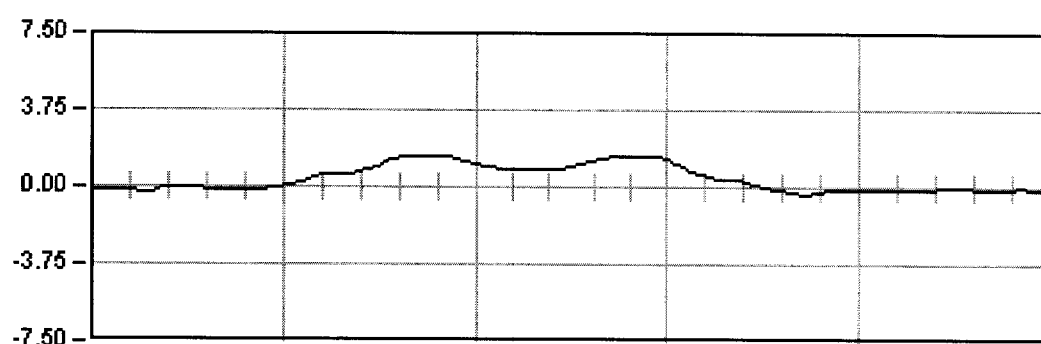
DINAMICA 21

25.5 Seg

Max: 1.50

Min: -0.71

Rem: 0.24



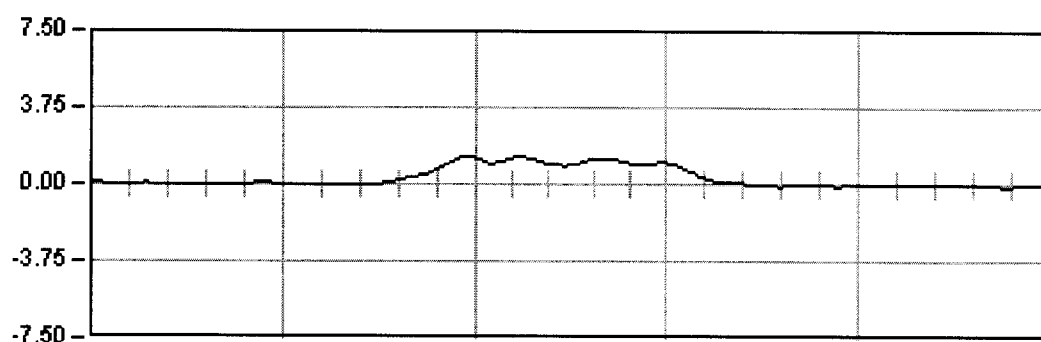
DINAMICA 22

3.0 Seg

Max: 1.55

Min: -0.34

Rem: -0.19



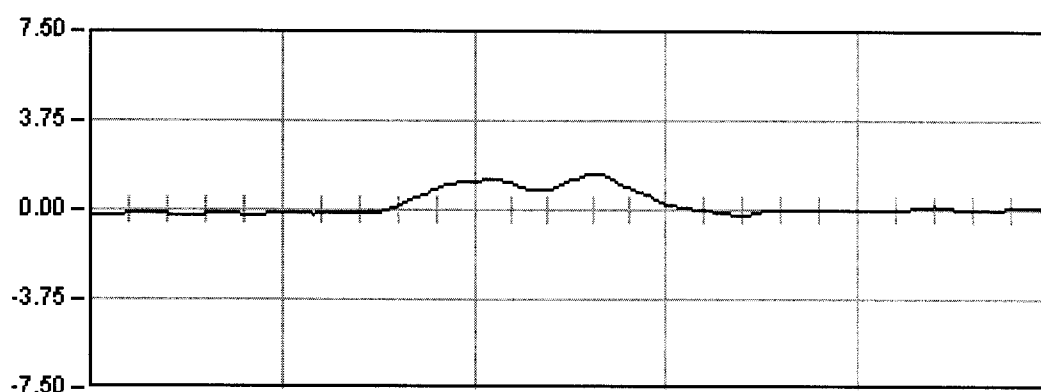
DINAMICA 23

2.8 Seg

Max: 1.35

Min: -0.41

Rem: -0.33



DINAMICA 24

3.2 Seg

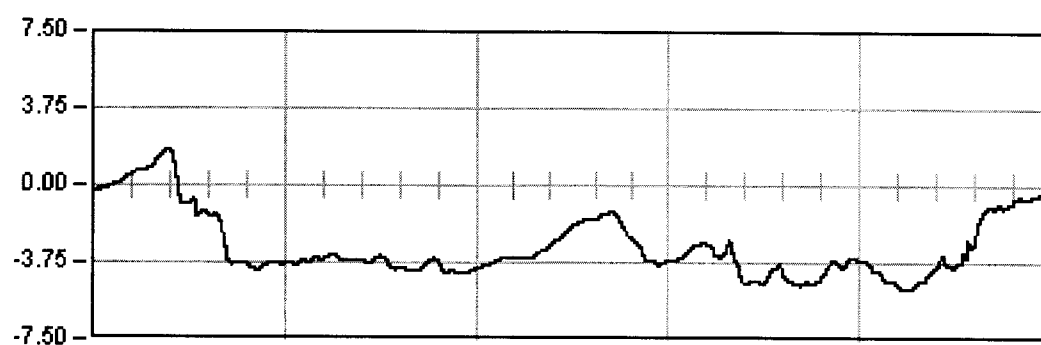
Max: 1.54

Min: -0.21

Rem: 0.01

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : G13    Canal : 36    Unidades :  $\mu E$



ESTATICA 01

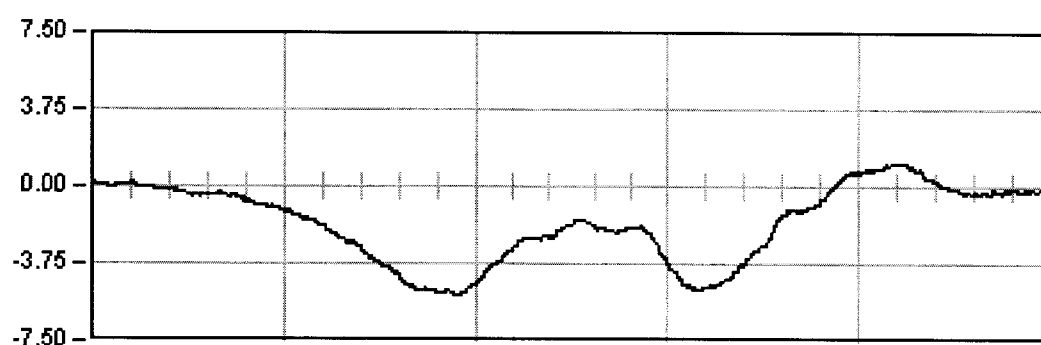
899.0    Seg

Est:    -3.94

Max:    -5.04

Min:    1.71

Rem:    -0.66



DINAMICA 01

25.0    Seg

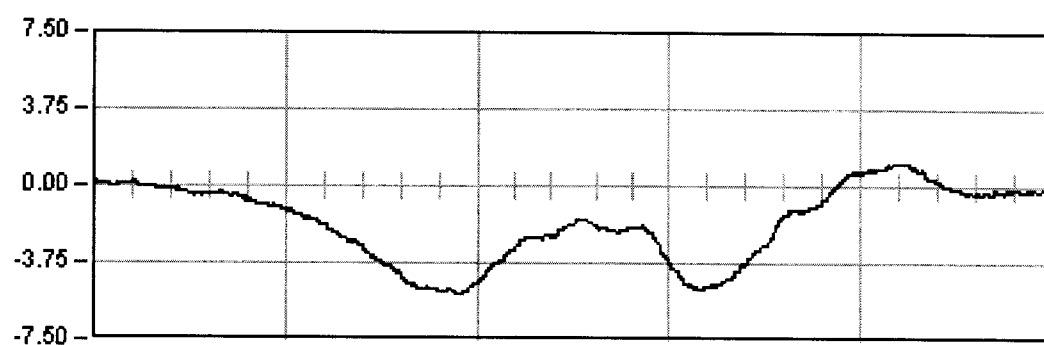
Max:    -5.26

Min:    1.19

Rem:    -0.16

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : G13    Canal : 36    Unidades :  $\mu E$



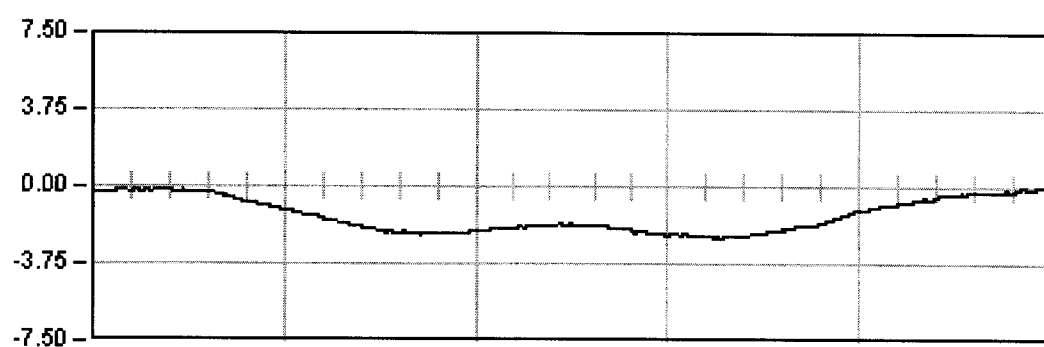
DINAMICA 01

25.0    Seg

Max:    -5.26

Min:    1.19

Rem:    -0.16



DINAMICA 21

19.3    Seg

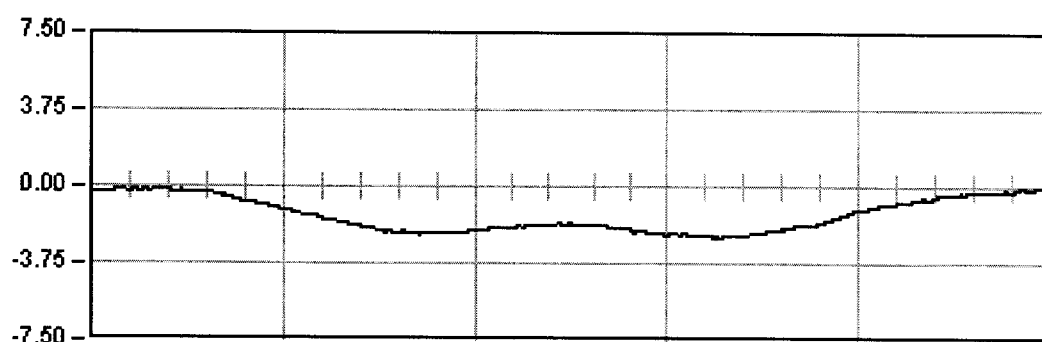
Max:    -2.45

Min:    0.29

Rem:    0.09

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : G13 Canal : 36 Unidades :  $\mu E$



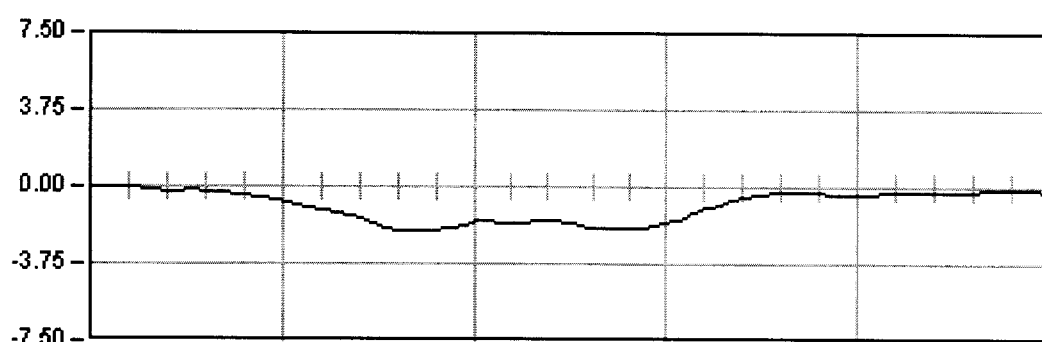
DYNAMICA 21

19.3 Seg

Max: -2.46

Min: 0.29

Rem: 0.09



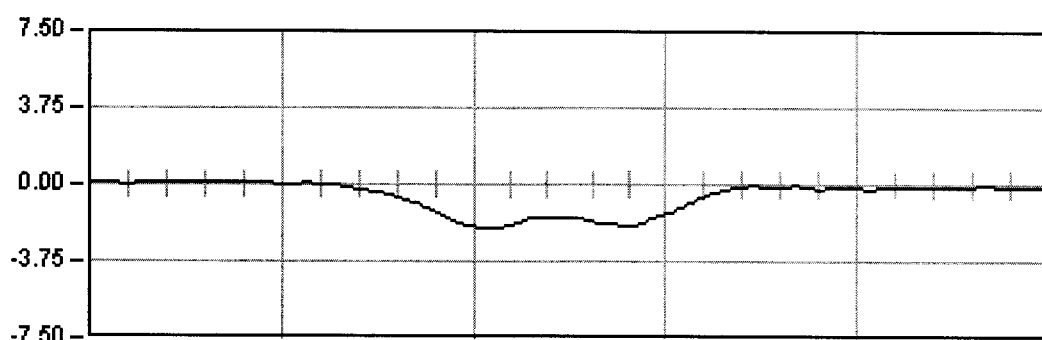
DYNAMICA 22

3.0 Seg

Max: -2.16

Min: 0.09

Rem: -0.09



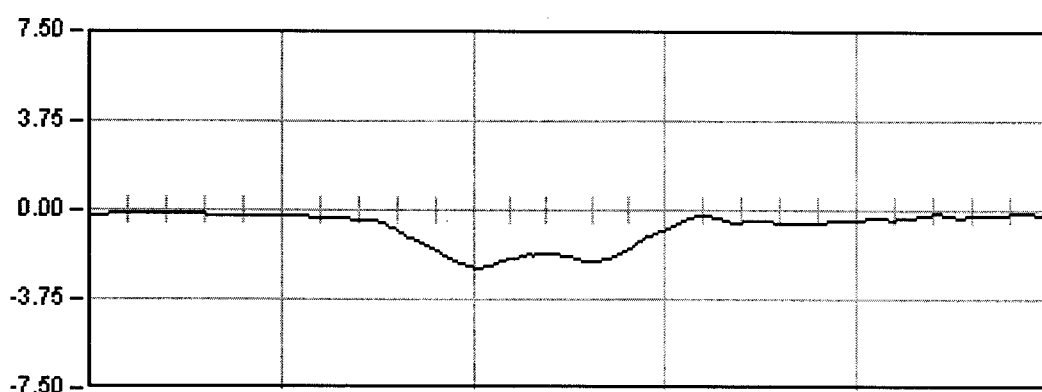
DYNAMICA 23

2.8 Seg

Max: -2.12

Min: 0.23

Rem: 0.03



DYNAMICA 24

3.2 Seg

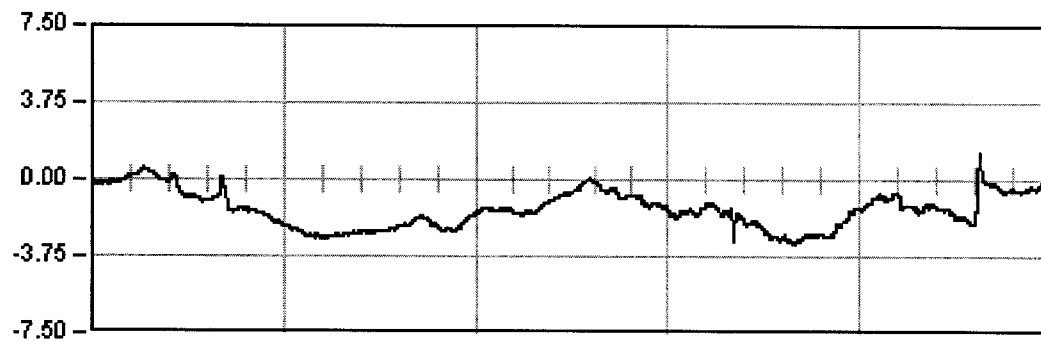
Max: -2.43

Min: 0.27

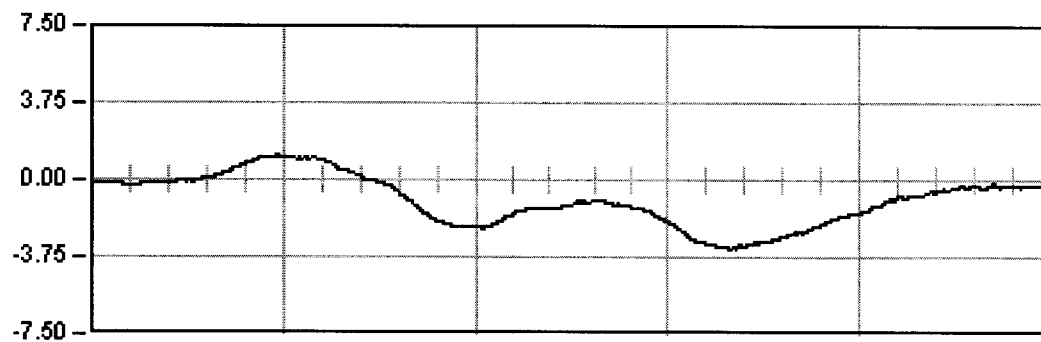
Rem: 0.13

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : G14    Canal : 37    Unidades :  $\mu\text{E}$



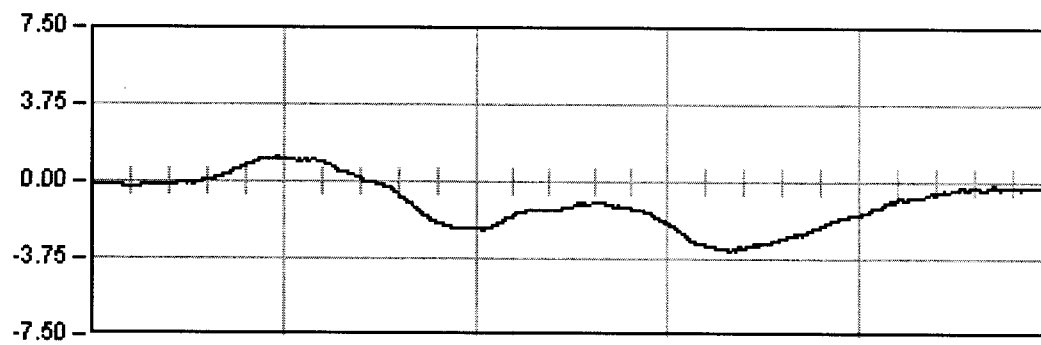
ESTATICA 01  
899.0    Seg  
Est:    -1.60  
Max:    -3.14  
Min:    1.33  
Rem:    -0.35



DINAMICA 01  
25.0    Seg  
Max:    -3.35  
Min:    1.19  
Rem:    -0.27

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : G14    Canal : 37    Unidades :  $\mu E$



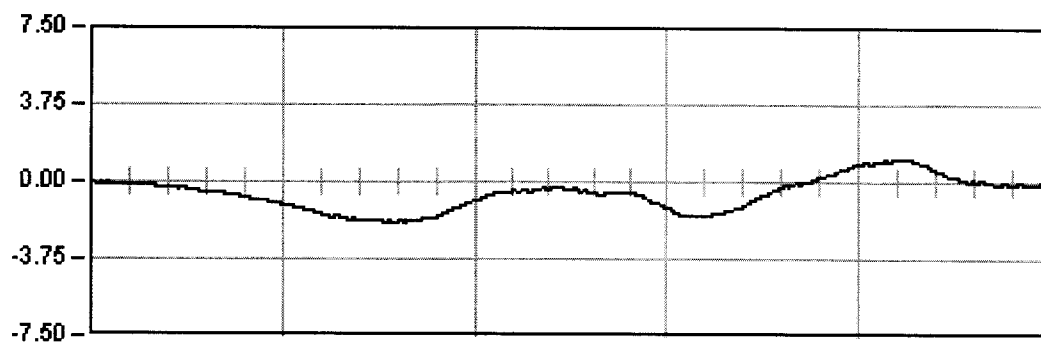
DINAMICA 01

25.0    Seg

Max:    -3.35

Min:    1.19

Rem:    -0.27



DINAMICA 21

19.9    Seg

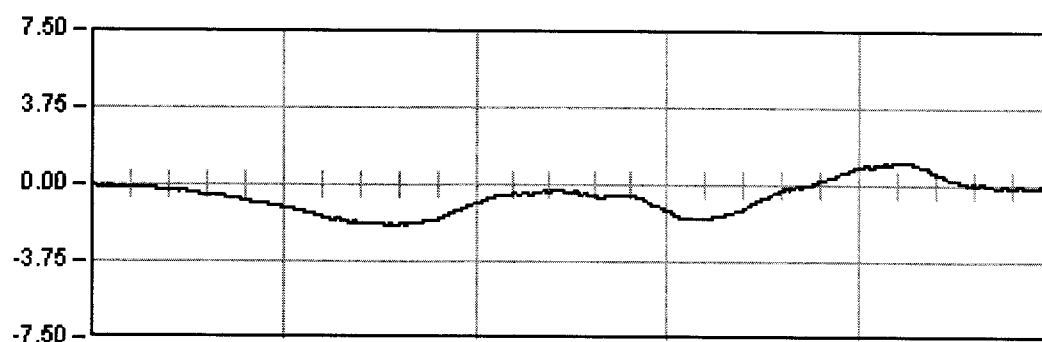
Max:    -1.98

Min:    1.13

Rem:    0.17

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : G14    Canal : 37    Unidades :  $\mu E$



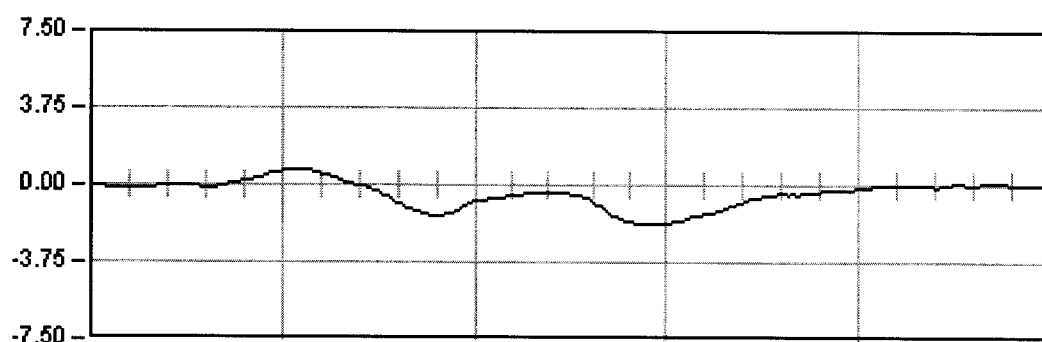
DINAMICA 21

19.9    Seg

Max:    -1.98

Min:    1.13

Rem:    0.17



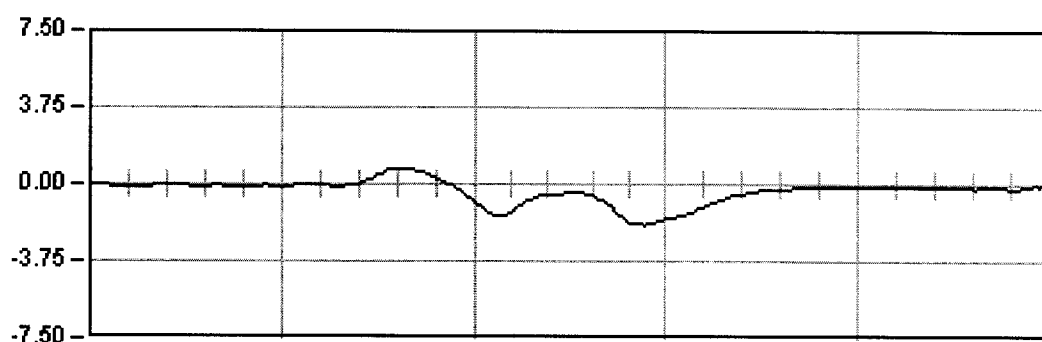
DINAMICA 22

3.0    Seg

Max:    -1.88

Min:    0.73

Rem:    0.15



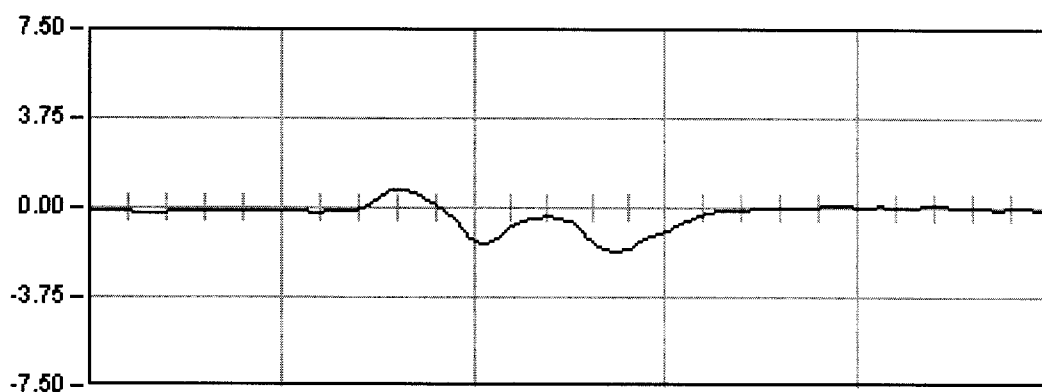
DINAMICA 23

2.8    Seg

Max:    -1.94

Min:    0.77

Rem:    0.38



DINAMICA 24

3.2    Seg

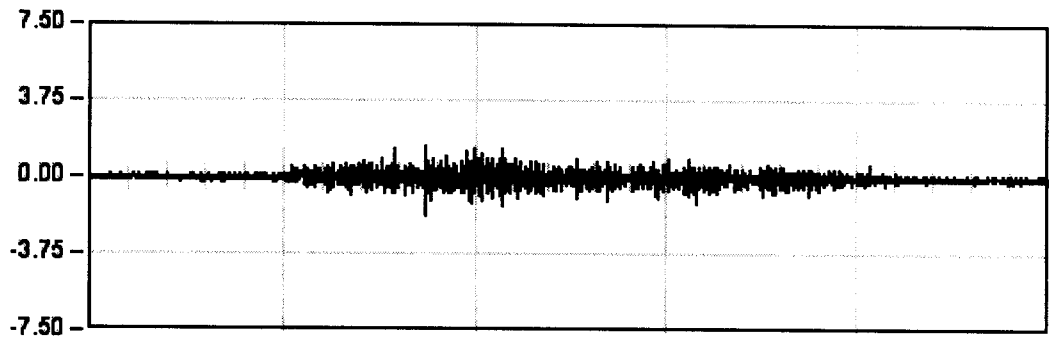
Max:    -1.82

Min:    0.80

Rem:    0.01

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : A11    Canal : 15    Unidades : G's/100



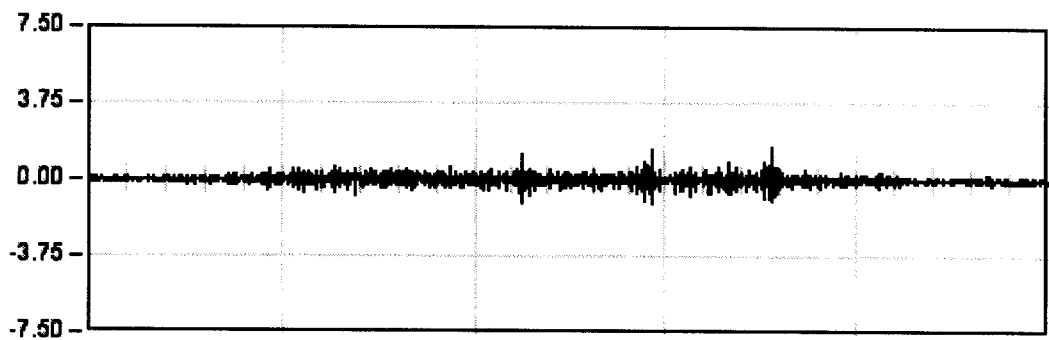
DINAMICA 01

25.0    Seg

Max:    -1.83

Min:    1.50

Rem:    -0.02



DINAMICA 21

19.3    Seg

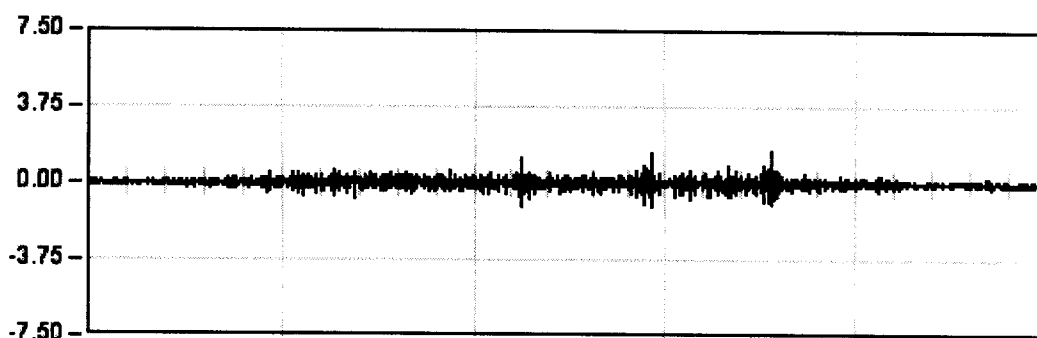
Max:    1.59

Min:    -1.12

Rem:    -0.01

06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA.

Punto : A11    Canal : 15    Unidades : G's/100



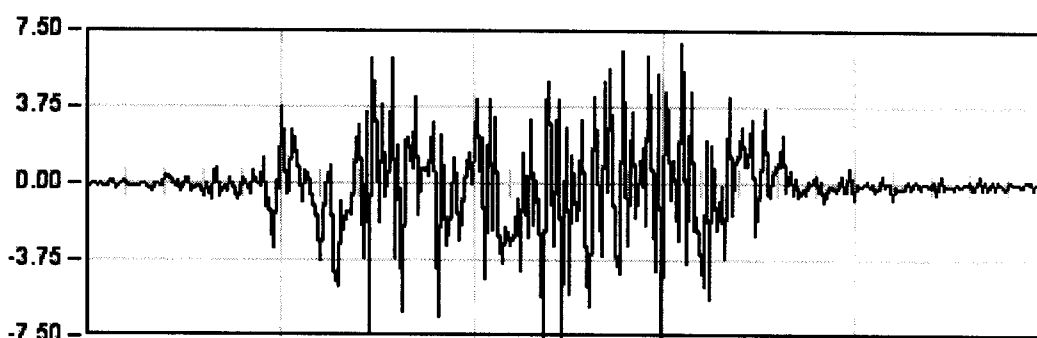
DINAMICA 21

19.3    Seg

Max:    1.59

Min:    -1.12

Rem:    -0.01



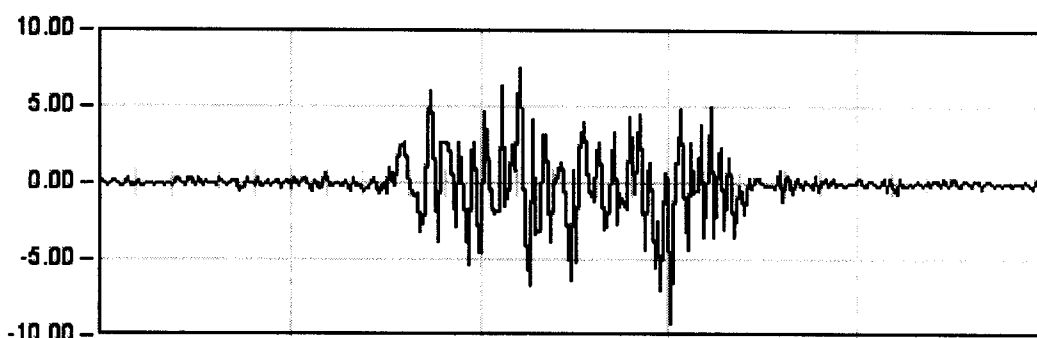
DINAMICA 22

3.0    Seg

Max:    -7.84

Min:    8.82

Rem:    0.01



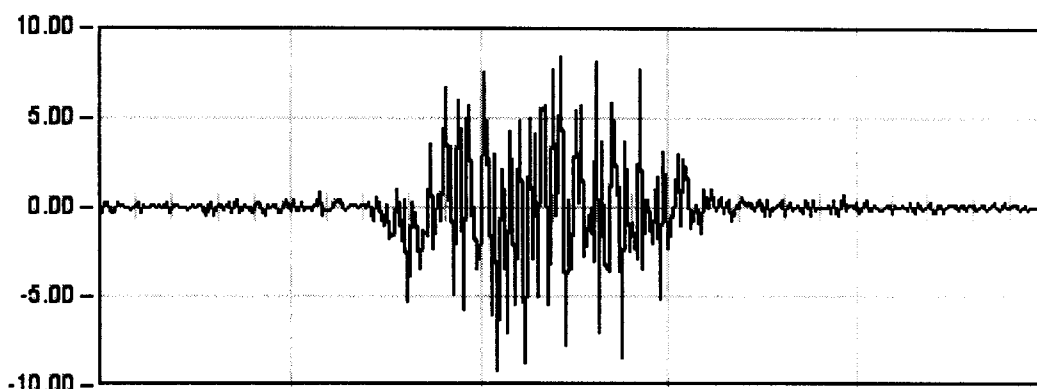
DINAMICA 23

2.8    Seg

Max:    -9.21

Min:    7.53

Rem:    0.01



DINAMICA 24

3.2    Seg

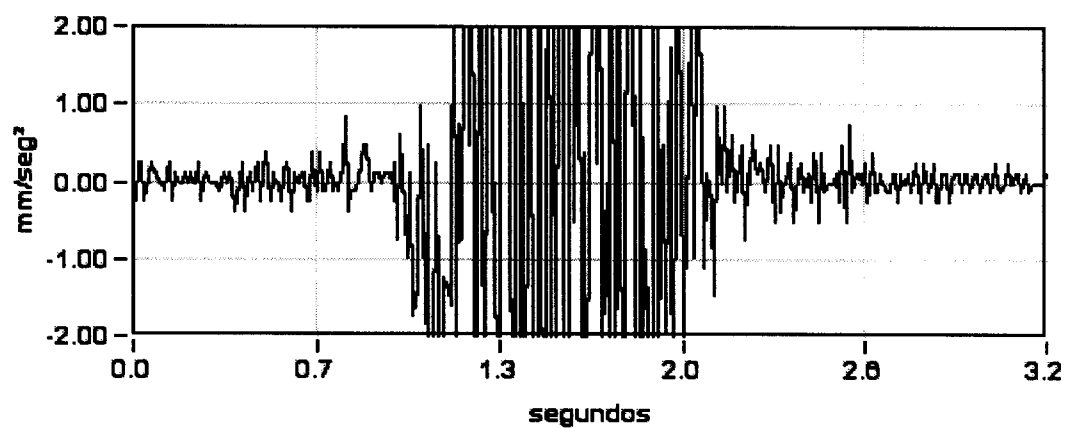
Max:    -9.11

Min:    8.37

Rem:    0.04

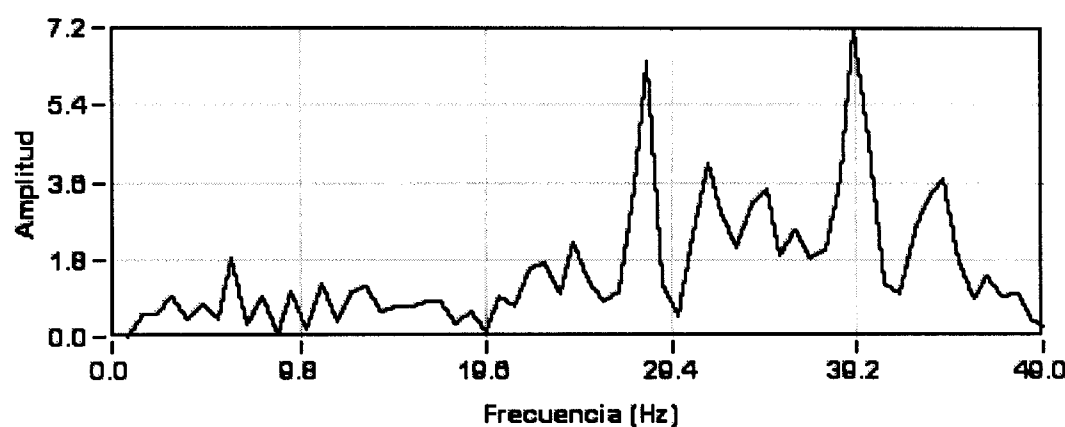
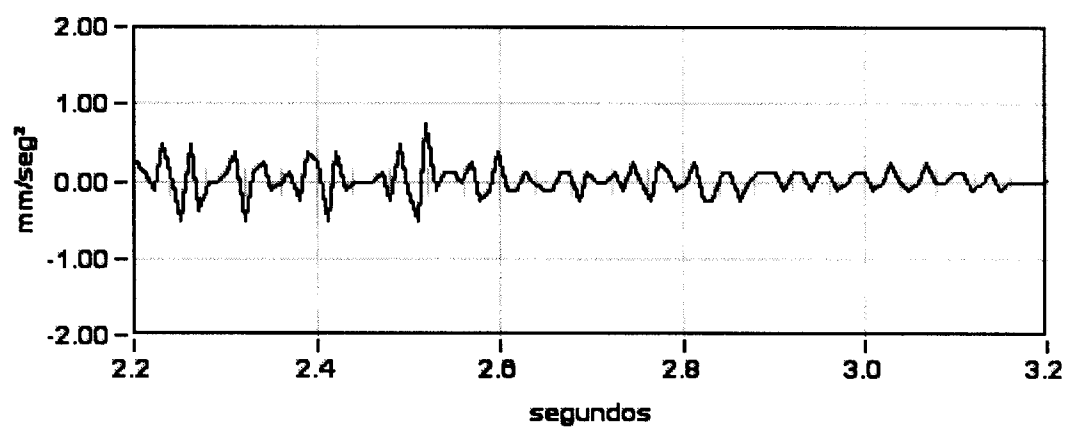
# 06PI04. L.A.V. MADRID-BARCELONA. BASE BRIHUEGA

Prueba: din24 Punto: A11 Canal: 15



|               |
|---------------|
| <b>Máximo</b> |
| -9.11         |

|               |
|---------------|
| <b>Mínimo</b> |
| 8.37          |



|                 |
|-----------------|
| <b>Amplitud</b> |
| 6.47            |

|                   |
|-------------------|
| <b>Frecuencia</b> |
| 28.14             |

|                     |
|---------------------|
| <b>Dec.Logarit.</b> |
| 0.09                |

|                    |
|--------------------|
| <b>Amortiguac.</b> |
| 1.40               |

## **ANEJO 5: REPORTAJE FOTOGRÁFICO**

Madrid, Diciembre de 2002



**FOTOGRAFÍA 1: Alzado derecho**



**FOTOGRAFÍA 2: Alzado izquierdo**



**FOTOGRAFÍA 3: Vista superior del Paso Inferior desde el estribo Madrid**



**FOTOGRAFÍA 4: Laboratorio móvil de TIFSA**



**FOTOGRAFÍA 5: Galgas, flechas y acelerómetro instrumentados a mitad de la luz del tablero del Paso Inferior**



**FOTOGRAFÍA 6: Vista desde el lateral izquierdo de la zona central del tablero con los puntos de medida colocados**



**FOTOGRAFÍA 7: Detalle de flecha y acelerómetro instrumentados en el punto medio de la sección central del tablero**



**FOTOGRAFÍA 8: Detalle de punto de medida de deformaciones unitarias en la sección central del tablero**



**FOTOGRAFÍA 9: Puntos para la medida de desplazamientos verticales del tablero fijados al suelo**

**ANEJO 6: ACTA DE LA PRUEBA DE CARGA**

Madrid, Diciembre de 2002

**ACTA DE LA PRUEBA DE CARGA**

| IDENTIFICACIÓN ESTRUCTURA |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LÍNEA DE ALTA VELOCIDAD   | MADRID - BARCELONA - FRONTERA FRANCESA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| TRAMO                     | POZO DE GUADALAJARA - ALCOLEA DEL PINAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| P.K.                      | 513 +360                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| IDENTIFICACIÓN INVENTARIO | 06PI04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| NOMBRE                    | PASO INFERIOR 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| DESCRIPCIÓN ESTRUCTURA    | Se trata de un marco cerrado de hormigón armado de 9,00 m de longitud y una anchura de 13,951 m con una luz libre inferior de 8,00 m.<br>La estructura está compuesta por una losa inferior de 0,95 m de espesor hormigonada in situ sobre la que se montan los hastiales formados por paneles prefabricados de 0,50 m de espesor hasta completar la anchura del puente. La altura de coronación de los hastiales así formados es de 4,90 m sobre la losa inferior. La distancia entre sus ejes es de 8,50 m. prolongándose mediante aletas a ambos lados que forman 30° con el eje transversal del puente.<br>El tablero descansa sobre los hastiales y está formado por una capa inferior de piezas prefabricadas de hormigón armado de 0,40 m de espesor y una capa superior de compresión hormigonada in situ de 0,55 m de espesor alcanzando el canto total del tablero 0,95 m. |

| ASISTENTES                                                    |                                           |
|---------------------------------------------------------------|-------------------------------------------|
| D. RAMIRO MARTÍNEZ-LLOP GUTIÉRREZ<br>D. JUSTO CARRETERO PÉREZ | ORGANISMO EMPRESA<br>G.I.F.<br>T.I.F.S.A. |

| CONDICIONES ATMOSFÉRICAS                             |            |                                       |                |                   |                |
|------------------------------------------------------|------------|---------------------------------------|----------------|-------------------|----------------|
| Temperatura                                          |            | 25 °C (31/07)                         |                |                   |                |
| Humedad relativa                                     |            | 40 % (31/07)                          |                |                   |                |
| INSTRUMENTACIÓN INSTALADA                            |            |                                       |                |                   | UNIDADES       |
| (según Informe de Prueba de Carga para la Recepción) |            |                                       |                |                   |                |
| CONTROL DE FLECHAS                                   |            | TRANSDUCTORES DE DESPLAZAMIENTO       |                |                   | 5              |
| GRADO TENSIONAL EN EL TABLERO                        |            | GALGAS EXTENSOMÉTRICAS                |                |                   | 4              |
| REGISTRO DE VIBRACIONES                              |            | ACELERÓMETROS                         |                |                   | 1              |
| TRENES DE CARGA UTILIZADOS                           |            |                                       |                |                   |                |
|                                                      | VEHÍCULO   | NÚMERO                                | TIPO           | PESO UNITARIO (t) | PESO TOTAL (t) |
| C1: COMPOSICIÓN UTILIZADA EN VÍA 1                   | LOCOMOTORA | 1                                     | GIF(Serie 060) | 120,0             | 120,0          |
| C2: COMPOSICIÓN UTILIZADA EN VÍA 2                   | LOCOMOTORA | 1                                     | GIF(Serie 060) | 120,0             | 120,0          |
| SENTIDO CIRCULACIÓN PARA PRUEBAS DINÁMICAS           |            | MADRID - ZARAGOZA y ZARAGOZA - MADRID |                |                   |                |

| PRUEBAS DE CARGA REALIZADAS                      |           |                             |            |                             |            |       |       |
|--------------------------------------------------|-----------|-----------------------------|------------|-----------------------------|------------|-------|-------|
|                                                  | VELOCIDAD | COMPOSICIÓN UTILIZADA VÍA 1 |            | COMPOSICIÓN UTILIZADA VÍA 2 |            |       |       |
|                                                  |           | HORA COMIENZO               | HORA FINAL | HORA COMIENZO               | HORA FINAL |       |       |
| Prueba estática ESTÁTICA 01                      | 0 km/h    | C1                          | 15:03      | 15:17                       | C2         | 15:03 | 15:17 |
| Prueba cuasiestática DINÁMICA 01                 | 5 km/h    | C1                          | 15:17      | 15:18                       | C2         | 15:17 | 15:18 |
| Prueba cuasiestática DINÁMICA 21                 | 5 km/h    | C1                          | -          | -                           | C2         | 15:18 | 15:21 |
| Prueba velocidad media DINÁMICA 22               | 40 km/h   | C1                          | -          | -                           | C2         | 15:21 | 15:23 |
| Prueba a máxima velocidad DINÁMICA 23            | 80 km/h   | C1                          | -          | -                           | C2         | 15:23 | 15:26 |
| Prueba de frenado a máxima velocidad DINÁMICA 24 | 80 km/h   | C1                          | -          | -                           | C2         | 15:26 | 15:29 |

| RESULTADOS BÁSICOS ALCANZADOS EN LA ESTRUCTURA                        |                                                                                                     |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Resultados prueba                                                     | Acordes con los teóricos previstos en el Proyecto de Prueba de Carga                                |
| Recuperaciones                                                        | Superiores al 80 % en todos los casos. Comportamiento de la estructura: Elástico                    |
| Anomalías detectadas en la inspección visual previa                   | En el momento de la inspección las barandillas laterales colocadas en el tablero eran provisionales |
| Anomalías detectadas durante el proceso de carga y al final del mismo | Ninguna                                                                                             |
| Otros datos de Interés                                                | Ninguno                                                                                             |
| Comportamiento resistente de la estructura                            | Correcto durante la realización de las pruebas de carga                                             |
| Observaciones                                                         | Ninguna                                                                                             |



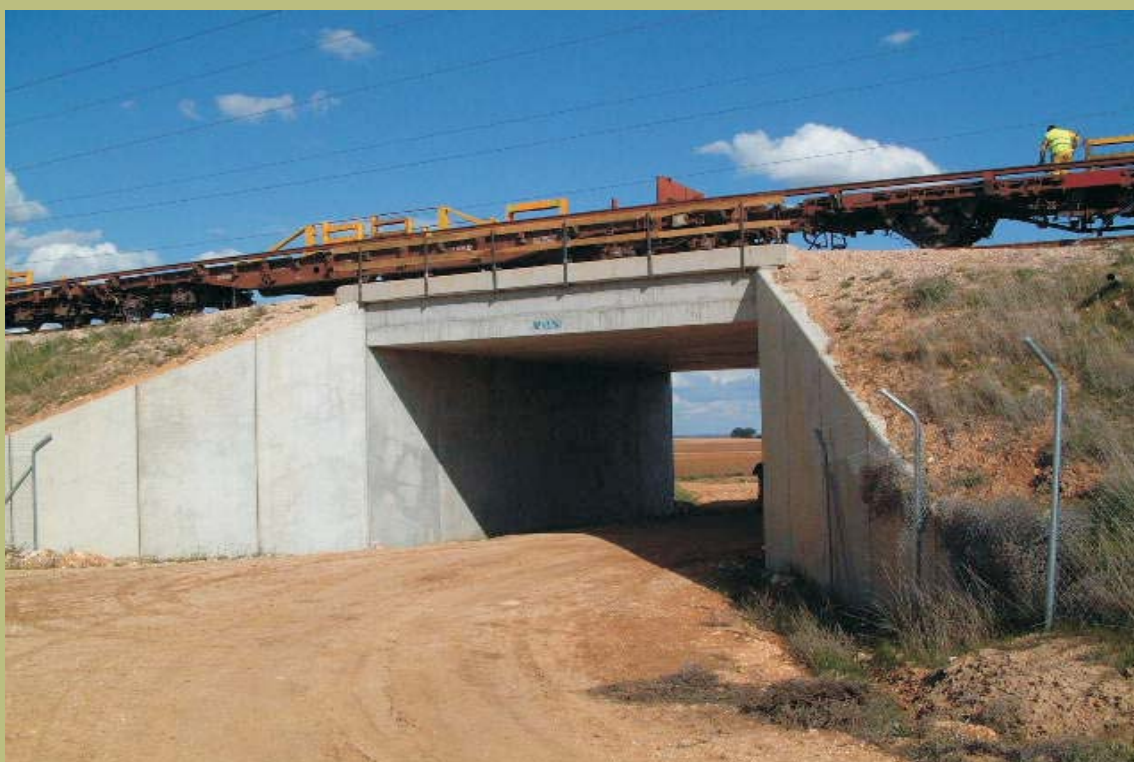
D. RAMIRO MARTÍNEZ-LLOP GUTIÉRREZ  
por G.I.F.

D. JUSTO CARRETERO PÉREZ  
por T.I.F.S.A.

**ANEJO 7: FICHA DE SEGUIMIENTO**

Madrid, Diciembre de 2002

**CONTRATO DE CONSULTORÍA Y ASISTENCIA  
PARA LA REALIZACIÓN DE PRUEBAS DE CARGA  
PARA LA RECEPCIÓN DE PUENTES DE LA  
LÍNEA DE ALTA VELOCIDAD  
MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA.  
TRAMO: POZO DE GUADALAJARA-ALCOLEA DEL PINAR.  
BASE DE BRIHUEGA.**



**FICHA DE SEGUIMIENTO (REVISIÓN 0)**

**SUBTRAMO V-α  
P.I.  
06PI04**

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTIERA FRANCESA**

**IDENTIFICACIÓN**

|                                         |                             |   |
|-----------------------------------------|-----------------------------|---|
| ID (Identificador de la estructura)     | <b>06PI04</b>               |   |
| P.K. INICIAL (sentido Madrid-Barcelona) | 513+355,5                   |   |
| P.K. FINAL (sentido Madrid-Barcelona)   | 513+364,5                   |   |
| TIPO                                    | Pontón (3 m <= luz <= 10 m) | ▼ |
| SUBTRAMO                                | MADRID-GAJANEJOS: V-a       | ▼ |
| FECHA DE LA INSPECCIÓN                  | 09/04/02                    |   |
| OBSERVACIONES                           |                             |   |

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTIERA FRANCESA**

**ID (Identificador de la estructura)**  
**FECHA DE LA INSPECCIÓN**

**06PI04**  
**09/04/02**

**DATOS GENERALES**

|                         |                                      |   |
|-------------------------|--------------------------------------|---|
| NOMBRE                  | PASO INFERIOR PI-4.                  |   |
| TIPOLOGÍA GENERAL       | MARCO                                | ▼ |
| TIPOLOGÍA ESTRUCTURAL   | ESTRUCTURA CONTINUA                  | ▼ |
| Nº DE VÍAS              | 2                                    |   |
| VELOCIDAD MÁXIMA (km/h) | 350                                  |   |
| TIPO DE ACCESO          | VEHÍCULO AUTOMOVIL                   | ▼ |
| OBSTÁCULO SALVADO       | CAMINO, VÍA PECUARIA O PASO DE FAUNA | ▼ |
| OBSERVACIONES           |                                      |   |

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTIERA FRANCESA**

**ID (Identificador de la estructura)**  
**FECHA DE LA INSPECCIÓN**

**06PI04**  
**09/04/02**

**PARÁMETROS GEOMÉTRICOS**

|                                                              |           |             |
|--------------------------------------------------------------|-----------|-------------|
| LONGITUD TOTAL (m)                                           | 9,20      |             |
| Nº DE VANOS                                                  | 1         |             |
| LONGITUD MEDIA DEL VANO (m)                                  | 9,20      |             |
| LUZ DE CADA VANO (m)                                         | 8,00      |             |
| ALTURA MÁXIMA DE ESTRIBOS (m)                                | 4,60      |             |
| ANCHURA MÁXIMA DE ESTRIBOS (m)                               | 14,10     |             |
| ALTURA MÁXIMA DE PILAS (m)                                   | -         |             |
| ANCHURA MÁXIMA DE PILAS (m)                                  | -         |             |
| ESPESOR MÁXIMO DE PILAS (m)                                  | -         |             |
| GÁLIBO INFERIOR (m)                                          | 4,60      |             |
| ANCHURA MÁXIMA DE TRAMOS (m)                                 | 14,10     |             |
| CANTO MÁXIMO DE TRAMOS EN CENTRO DE VANOS (m)                | 0,95      |             |
| Nº DE ELEMENTOS PRINCIPALES EN EL TRAMO                      | 1         |             |
| SEPARACIÓN ENTRE ELEMENTOS PRINCIPALES (m)                   | -         |             |
| CANTO DE ELEMENTOS PRINCIPALES                               | CONSTANTE | ▼           |
| CANTO MÁXIMO DE ELEMENTOS PRINCIPALES EN CENTRO DE VANOS (m) | 0,95      |             |
| GÁLIBO IZQUIERDO (m)                                         | 4,70      |             |
| GÁLIBO DERECHO (m)                                           | 4,50      |             |
| ENTREVÍA (m)                                                 | 4,70      |             |
| TRAZADO DE VÍA EN PLANTA (m)                                 |           | R (recto) ▼ |
| PERALTE DE VÍA DE ENTRADA (m)                                | -         |             |
| PERALTE DE VÍA DE CENTRO (m)                                 | -         |             |
| PERALTE DE VÍA DE SALIDA (m)                                 | -         |             |
| OBSERVACIONES                                                |           |             |

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA**

**ID (Identificador de la estructura)**  
**FECHA DE LA INSPECCIÓN**

**06PI04**  
**09/04/02**

**MATERIALES**

MATERIAL CONSTITUYENTE

HORMIGÓN EN MASA O ARMADO ▼

**TRAMOS**

TIPOLOGÍA DE TRAMOS

MARCO ▼

TIPOLOGÍA ESTRUCTURAL DE TRAMOS

ESTRUCTURA CONTINUA ▼

MATERIAL EN TRAMOS

HORMIGÓN ARMADO O EN MASA ▼

IMPERMEABILIZACIÓN DE ESTRUCTURA DE TRAMOS

SI ▼

ELEMENTOS DE DRENAJE EN TRAMOS

NO EXISTEN ▼

**ESTRIBOS**

TIPOLOGÍA DE ESTRIBOS

MURO FRONTAL Y ALETAS ▼

MATERIAL BASE EN ESTRIBOS

HORMIGÓN ARMADO O EN MASA ▼

PROTECCIÓN EN PIE DE ESTRIBOS

NO EXISTE ▼

TIPOLOGÍA DE CIMENTACIÓN EN ESTRIBOS

CIMENTACIÓN DIRECTA ▼

MATERIAL BASE EN CIMENTACIÓN DE ESTRIBOS

HORMIGÓN ARMADO O EN MASA ▼

**PILAS**

TIPOLOGÍA DE PILAS

▼

SECCIÓN DE PILAS

▼

TAJAMARES

▼

MATERIAL BASE EN PILAS

▼

TIPOLOGÍA DE CIMENTACIÓN EN PILAS

▼

MATERIAL BASE EN CIMENTACIÓN DE PILAS

▼

**APARATOS Y JUNTAS DE DILATACIÓN**

APARATOS DE APOYO

NO EXISTEN ▼

JUNTAS DE DILATACIÓN

AMBOS ESTRIBOS ▼

TIPOLOGÍA DE JUNTAS DE DILATACIÓN

MURETES GUARDABALASTO Y CUBREJUNTAS ▼

APARATOS DE DILATACIÓN DE CARRILES

NO EXISTEN ▼

**VARIOS**

PASEOS DE SERVICIO

AMBOS LADOS ▼

OBSERVACIONES

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTIERA FRANCESA**

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**ESTADO ACTUAL ESTRIBOS**

|                                           |                                           |   |
|-------------------------------------------|-------------------------------------------|---|
| Punzonado bajo apoyos                     | 0: No existen daños                       | ▼ |
| Daños en unión frente y laterales         | 0: No existen daños                       | ▼ |
| Juntas degradadas                         | 0: No existen daños                       | ▼ |
| Golpes y roturas                          | 0: No existen daños                       | ▼ |
| Fisuras y grietas                         | 1: Defectos con incidencia en la estética | ▼ |
| Coqueras y nidos de grava                 | 0: No existen daños                       | ▼ |
| Meteorización y degradación               | 0: No existen daños                       | ▼ |
| Desprendimientos                          | 0: No existen daños                       | ▼ |
| Carbonatación y desagregación             | 0: No existen daños                       | ▼ |
| Armaduras vistas someras                  | 0: No existen daños                       | ▼ |
| Corrosión y disgregación                  | 0: No existen daños                       | ▼ |
| Humedades y filtraciones                  | 0: No existen daños                       | ▼ |
| Incrustaciones calcáreas y eflorescencias | 0: No existen daños                       | ▼ |
| Desagüe de mechinales                     | 0: No existen daños                       | ▼ |
| Abombamientos                             | 0: No existen daños                       | ▼ |
| Desplomes o basculamientos                | 0: No existen daños                       | ▼ |
| Asentamientos                             | 0: No existen daños                       | ▼ |
| Descalces                                 | 0: No existen daños                       | ▼ |
| Socavaciones                              | 0: No existen daños                       | ▼ |
| Depósitos en coronación                   | 0: No existen daños                       | ▼ |
| Daños en coronación                       | 0: No existen daños                       | ▼ |
| Daños en espaldón                         | 0: No existen daños                       | ▼ |
| Balasto encastrado                        | 0: No existen daños                       | ▼ |
| Daños en protección de pie de estribos    | 0: No existen daños                       | ▼ |
| Daños en cimentaciones vistas             | 0: No existen daños                       | ▼ |
| Vegetación aflorando                      | 0: No existen daños                       | ▼ |
| Vegetación adosada                        | 0: No existen daños                       | ▼ |

OBSERVACIONES ESTRIBOS

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTIERA FRANCESA**

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**06PI04**  
**09/04/02**

**ESTADO ACTUAL PILAS**

|                                           |   |
|-------------------------------------------|---|
| Punzonado bajo apoyos                     | ▼ |
| Daños en unión frente y laterales         | ▼ |
| Juntas degradadas                         | ▼ |
| Golpes y roturas                          | ▼ |
| Fisuras y grietas                         | ▼ |
| Coqueras y nidos de grava                 | ▼ |
| Meteorización y degradación               | ▼ |
| Desprendimientos                          | ▼ |
| Carbonatación y desagregación             | ▼ |
| Armaduras vistas someras                  | ▼ |
| Corrosión y disgregación                  | ▼ |
| Humedades y filtraciones                  | ▼ |
| Incrustaciones calcáreas y eflorescencias | ▼ |
| Abombamientos                             | ▼ |
| Desplomes o basculamientos                | ▼ |
| Asentamientos                             | ▼ |
| Descalces                                 | ▼ |
| Socavaciones                              | ▼ |
| Depósitos en coronación                   | ▼ |
| Daños en coronación                       | ▼ |
| Daños en cimentaciones vistas             | ▼ |
| Vegetación aflorando                      | ▼ |
| Vegetación adosada                        | ▼ |

**OBSERVACIONES PILAS**

**NO TIENE PILAS.**

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTIERA FRANCESA**

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**ESTADO ACTUAL APARATOS DE APOYO**

Envejecimiento

Corrosión

Suciedad y aterramiento

Bloqueo o encastramiento

Desplazamiento o deslizamiento

Aplastamiento

Reglaje incorrecto

Desnivelaciones

Falta de contacto

Cunas de apoyo deterioradas

Vegetación adosada

OBSERVACIONES APARATOS DE APOYO

No existen aparatos de apoyo

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTIERA FRANCESA**

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**ESTADO ACTUAL ESTRUCTURA DE TRAMOS**

|                                               |                     |   |
|-----------------------------------------------|---------------------|---|
| Pintura envejecida y desprendida              |                     | ▼ |
| Oxidación superficial                         |                     | ▼ |
| Corrosiones locales activas                   |                     | ▼ |
| Entalladuras y pérdidas de sección            |                     | ▼ |
| Elementos metálicos deformados o rotos        |                     | ▼ |
| Tornillos flojos o faltan                     |                     | ▼ |
| Soldaduras fisuradas                          |                     | ▼ |
| Fisuras y grietas longitudinales bóvedas      |                     | ▼ |
| Fisuras y grietas transversales clave         |                     | ▼ |
| Fisuras y grietas transversales riñones       |                     | ▼ |
| Fisuras y grietas transversales arranques     |                     | ▼ |
| Fisuras y grietas longitudinales tímpanos     |                     | ▼ |
| Fisuras y grietas verticales tímpanos         |                     | ▼ |
| Separación y filtraciones tímpano-bóveda      |                     | ▼ |
| Fisuras y grietas longitudinales losas        | 0: No existen daños | ▼ |
| Fisuras y grietas transversales losas         | 0: No existen daños | ▼ |
| Fisuras y grietas verticales losas            | 0: No existen daños | ▼ |
| Fisuras y grietas alas superiores vigas       | 0: No existen daños | ▼ |
| Fisuras y grietas longitudinales alas-alma    | 0: No existen daños | ▼ |
| Fisuras y grietas transversales alma vigas    | 0: No existen daños | ▼ |
| Fisuras y grietas inclinadas alma vigas       | 0: No existen daños | ▼ |
| Fisuras y grietas longitudinales ala inferior | 0: No existen daños | ▼ |
| Fisuras y grietas transversales ala inferior  | 0: No existen daños | ▼ |
| Fisuras y daños en testeros                   | 0: No existen daños | ▼ |
| Golpes y roturas                              | 0: No existen daños | ▼ |
| Coqueras y nidos de grava                     | 0: No existen daños | ▼ |
| Meteorización y degradación                   | 0: No existen daños | ▼ |
| Desprendimientos                              | 0: No existen daños | ▼ |
| Carbonatación y desagregación                 | 0: No existen daños | ▼ |
| Armaduras vistas someras                      | 0: No existen daños | ▼ |
| Corrosión y disgregación                      | 0: No existen daños | ▼ |
| Humedades y filtraciones                      | 0: No existen daños | ▼ |
| Desagües obturados                            | 0: No existen daños | ▼ |
| Incrustaciones calcáreas y eflorescencias     | 0: No existen daños | ▼ |
| Abombamientos                                 | 0: No existen daños | ▼ |
| Asentamientos y desnivelaciones               | 0: No existen daños | ▼ |
| Juntas transversales degradadas               | 0: No existen daños | ▼ |
| Vegetación aflorando                          | 0: No existen daños | ▼ |
| Vegetación adosada                            | 0: No existen daños | ▼ |

OBSERVACIONES ESTRUCTURA DE TRAMOS

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTIERA FRANCESA**

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**09/04/02**

**ESTADO ACTUAL RESTO DE ELEMENTOS**

|                          |                     |   |
|--------------------------|---------------------|---|
| Impermeabilización       | 0: No existen daños | ▼ |
| Drenaje longitudinal     | 0: No existen daños | ▼ |
| Drenaje transversal      | 0: No existen daños | ▼ |
| Muretes guardabalasto    | 0: No existen daños | ▼ |
| Juntas de dilatación     | 0: No existen daños | ▼ |
| Conducciones y canaletas | 0: No existen daños | ▼ |
| Barandillas              | 0: No existen daños | ▼ |

**OBSERVACIONES RESTO DE ELEMENTOS**

En el momento de la inspección las barandillas colocadas sobre el tablero del Paso Inferior eran provisionales.

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTIERA FRANCESA**

**ID (Identificador de la estructura)**  
**FECHA DE LA INSPECCIÓN**

**06PI04**  
**09/04/02**

**ESTADO ACTUAL**

**ESTADO GENERAL**

ESTADO GENERAL ESTRIBOS

ESTADO GENERAL PILAS

ESTADO GENERAL APARATOS DE APOYO

ESTADO GENERAL ESTRUCTURA DE TRAMOS

ESTADO GENERAL RESTO DE ELEMENTOS

OBSERVACIONES

1: Defectos con incidencia en la estética

1: Defectos con incidencia en la estética

0: No existen daños

0: No existen daños

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA**



FOTOGRAFÍA Nº 1: ALZADO DERECHO



FOTOGRAFÍA Nº 2: ALZADO IZQUIERDO

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA**



FOTOGRAFÍA Nº 3: VISTA DE ALETA DERECHA DE ESTRIBO MADRID



FOTOGRAFÍA Nº 4: VISTA INFERIOR DEL TABLERO

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA**



FOTOGRAFÍA N° 5: JUNTA ENTRE PARAMENTO VERTICAL Y LOSA DE TABLERO



FOTOGRAFÍA N° 6: VISTA LATERAL DE UNIÓN DE PARAMENTO VERTICAL, TABLERO Y ALETA

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA**



FOTOGRAFÍA N° 7: CANAL INFERIOR JUNTO A ESTRIBO SIN ELEMENTOS DE FÁBRICA



FOTOGRAFÍA N° 8: MÓDULOS VERTICALES DE PARAMENTO DE ESTRIBO

**INSPECCIONES ESTRUCTURAS**  
**L.A.V. MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA**



FOTOGRAFÍA Nº 9: VISTA SUPERIOR DEL PASO INFERIOR DESDE EL ESTRIBO MADRID



FOTOGRAFÍA Nº 10: VISTA SUPERIOR DEL PASO INFERIOR DESDE EL ESTRIBO ZARAGOZA

## **ANEJO 8: NIVELACIÓN DE LA ESTRUCTURA**

**Madrid, Diciembre de 2002**

En esta estructura no se ha efectuado Planimetría y Nivelación.