

Maestría en Ingeniería Civil

**EVALUACIÓN DE METODOLOGÍAS DE INTERACCIÓN SUELO –
ESTRUCTURA APLICADAS A LA ACCIÓN SIMULTÁNEA DE
ESTRUCTURAS ADYACENTES PARA CIMIENTO SUPERFICIAL.**

Liliana Camacho Angarita

Bogotá, D.C., 24 de mayo de 2022



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**Tesis para optar al título de magíster en Ingeniería Civil, con énfasis en
geotecnia**

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Bogotá, D.C., 24 de mayo de 2022



La tesis de maestría titulada **“Evaluación de metodologías de interacción suelo – estructura aplicadas a la acción simultánea de estructuras adyacentes para cimiento superficial.”**, presentada por Liliana Camacho Angarita, cumple con los requisitos establecidos para optar al título de Magíster en Ingeniería Civil con énfasis en geotecnia.

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Dedicatoria

A Dios en primer lugar por permitirme la vida, los medios, y todas las cosas que me han llevado al cumplimiento de este gran logro; a mi familia que me ha apoyado en cada momento difícil y han vivido todo el proceso de formación profesional y pos gradual; en especial a mis padres Luis Euclides Camacho Prada y Marleny Angarita Velasco, pues han sido mi mayor motivación.

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Resumen

Para cimientos superficiales, el análisis y diseño ha estado tradicionalmente ligado al uso de metodologías simplificadas, que aceptan la hipótesis de la variación de esfuerzos en el suelo, como comportamiento lineal elástico, asumiendo el cimiento como “rígido”, lo cual idealiza ambos medios; sin embargo, las presiones de contacto, dependen de diversos factores, los cuales son: El grado de rigidez de la fundación, la forma o disposición de la fundación, el tipo de suelo y la distribución de cargas aplicadas; cuando se consideran cimientos que, por factores externos relacionados a la ubicación del sitio, se tienen estructuras adyacentes con cercanía en líneas de lindero, pueden generar incremento en los esfuerzos, dando lugar a deformaciones.

Para considerar la interacción suelo – estructura, se encuentra la metodología por el módulo de reacción del terreno o coeficiente de balasto, en el cual se involucra la respuesta del suelo, siendo simulado como una “cama de resorte”, el cual se fundamenta en el modelo de Winkler et al (1867), siendo usado por la ingeniería estructural, para el diseño de cimentaciones superficiales; como segundo mecanismo, se encuentra la modelación mediante elementos finitos, que permite incluir el comportamiento no elástico del suelo, bajo la modelación de una porción de suelo considerable bajo la cimentación planteada.

En el presente trabajo se realizó el diseño estructural de las edificaciones, para tres sistemas estructurales diferentes (pórticos en concreto, muros de carga y mampostería estructural); se determinaron las dimensiones del cimiento como placa y teniendo en cuenta los parámetros geotécnicos de un suelo cohesivo de la ciudad de Bogotá, se llevaron a cabo las modelaciones por las dos metodologías de interacción suelo – estructura.

De los modelos realizados en SAP 2000 y MIDAS GTS NX V20 2.1, se evaluaron los efectos de los esfuerzos y deformaciones en el suelo y cimiento, evidenciando que en edificaciones colindantes cargados de manera simultánea en el suelo, el comportamiento de las placas se verá reflejada como si fuera una sola cimentación; si una estructura es cargada inicialmente y posteriormente la otra, esta última refleja incrementos en los resultados de la primera cimentación; se comprueba que para el modelo de Winkler, para la condición de estructuras simultáneas, los resultados son conservadores; para el caso en el que se carga de manera posterior una edificación, la metodología por elementos finitos, refleja el incremento de los esfuerzos y deformaciones de la edificación cargada inicialmente, no considerando este efecto el modelo de Winkler.

Palabras Clave: Interacción suelo – estructura, cimentaciones superficiales, esfuerzos, deformaciones, colindancia, estructuras adyacentes.

Abstract

For shallow foundations, the analysis and design has traditionally been linked to the use of simplified methodologies, which accepts the hypothesis of stress variation in the soil, as linear elastic behavior, assuming the foundation as "rigid", which idealizes both materials; Of the contact pressures, which depend on several factors, which are: The degree of stiffness of the foundation, the shape or arrangement of the foundation, the type of soil and the distribution of applied loads, when considering foundations that, due to external factors related to the location of the site, have adjacent structures with proximity in boundary lines, can generate increased stresses, resulting in deformations.

To consider the soil - structure interaction, there is the methodology by the modulus of soil reaction or ballast coefficient, which involves the soil response, being simulated as a "spring bed", which is based on the model of Winkler (1867), being used by structural engineering, for the design of shallow foundations; as a second mechanism, there is the modeling by finite elements which allows including the non-elastic behavior of the soil, under the modeling of a considerable portion of soil under the proposed foundation.

In the present document, the structural design of the buildings was carried out for three different structural systems (concrete portal frames, load-bearing walls and structural masonry); the dimensions of the foundation were determined as a plate and taking into account the geotechnical parameters of a cohesive soil of the city of Bogotá, the modeling was carried out by the two methodologies of soil-structure interaction.

From the models made in SAP 2000 and MIDAS GTS NX V20 2.1, the effects of stresses and deformations in the soil and foundation were evaluated, showing that in adjacent buildings loaded simultaneously in the soil, the behavior of the plates will be reflected as if it were a single foundation; if one structure is loaded initially and later the other, the latter reflects increases in the results of the first foundation; It is verified that for the Winkler model, for the condition of simultaneous structures, the results are conservative; for the case in which a building is subsequently loaded, the finite element methodology reflects the increase of the stresses and deformations of the initially loaded building, not considering this effect in the Winkler model.

Key words: Soil-structure interaction, shallow foundations, stresses, deformations, adjoining structures, adjacent structures.

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1. Introducción

Toda obra de ingeniería debe garantizar, tanto en el diseño como en su construcción, criterios de seguridad, estabilidad y funcionalidad que permitan preservar las vidas que en ellas se consideran y se mantengan a lo largo de su vida útil. Siendo las cimentaciones, encargadas de transmitir el conjunto de fuerzas generados por las cargas y pesos, a una zona capaz de soportarlas, la cual, como respuesta a dicha perturbación a su condición inicial, se deforma y presenta cambios de esfuerzos que afectan la estabilidad y funcionamiento; lo anterior, describe de forma general el comportamiento que pueden presentar el suelo o roca en el que se apoyan las estructuras.

Caso común de las zonas urbanas, es el construir las estructuras adyacentes a otras, y siendo cada una de las edificaciones independientes, las cargas transmitidas al suelo o roca, pueden generar superposición de bulbos de presiones, que, pueden producir asentamientos excesivos o incluso la falla del suelo, por estar este sometido a esfuerzos superiores a su resistencia permisible.

Por ello, en el presente trabajo se estudian los esfuerzos y deformaciones del suelo y estructura, para el caso de edificaciones adyacentes para tres sistemas estructurales (pórticos en concreto, muros de concreto, y muros en mampostería), empleando las metodologías de interacción suelo estructura.

Esta propuesta es relevante para ser abordada, ya que es menester para la ingeniería de fundaciones, estudiar los comportamientos e incidencias de la estructura-suelo y que permita tomar referencia a casos comunes a los cuales los ingenieros de hoy se ven expuestos a resolver. Dicho enfoque compete no solo a los ingenieros estructurales, quienes son los diseñadores de la estructura del cimiento, sino también a la rama de la geotecnia; ya que, en la interacción de estos dos énfasis de la ingeniería, principalmente al estudio de los suelos de fundación, se genera mayor incertidumbre y diversidad de factores que influyen en su comportamiento.

2. Problema de investigación:

2.1. Planteamiento del problema

Las fundaciones son consideradas como “los elementos estructurales de transmisión de cargas al suelo, [y] la zona del terreno cuyo comportamiento resulta afectado por las cargas” (Vargas,

Ingeniería de fundaciones, fundamentos e introducción al análisis geotécnico, 1996, pág. 107); partiendo de que los materiales que componen la estructura y el suelo, tienen características diferentes las cuales suponen también un comportamiento diferente, es necesario entonces evaluar el diseño de las cimentaciones en función de ambos medios. Si se tiene un cimiento “rígido” en suelos blandos, este criterio variaría al evaluar el mismo cimiento en un suelo duro, siendo el criterio rígido relativo a las propiedades de la estructura de fundación y en el caso del suelo, al estado y características de este. Por ello, “Los cimientos realizan [la función de amortiguador a las posibles deformaciones], siempre que se busque el tipo más conveniente, apropiado para cada combinación particular estructura-suelo y se diseñen aplicando criterios de correcta ubicación y estabilidad...” (Vargas, Ingeniería de fundaciones, fundamentos e introducción al análisis geotécnico, 1996, pág. 108) esto, cumpliendo que hayan deformaciones tolerables y seguridad ante una posible falla. Lo anterior, refiere el determinar una distribución razonable de la presión de contacto la cual depende de varios factores, los cuales son: El grado de rigidez de la fundación, la forma o disposición de la fundación, el tipo de suelo y la distribución de cargas aplicadas.

Sin embargo, para el caso en el cual factores externos relacionados a la ubicación del sitio, por efecto de la superposición de esfuerzos generados por la acción de estructuras adyacentes y líneas de lindero, generan: deformaciones en el suelo de soporte, causan esfuerzos los cuales se propagan tanto vertical como horizontalmente dando lugar a deformaciones que podrían ser permanentes y nocivas para las estructuras antiguas como nuevas. La norma sismo resistente – NSR 10. menciona que:

En los cálculos se tendrá en cuenta la interacción entre los diferentes elementos de la cimentación de la estructura y de las edificaciones vecinas, como analizar si hay superposición de bulbos de carga, los efectos de los sótanos, las excentricidades de los centros de gravedad y de cargas que en conjunto se ocasionan (Reglamento Colombiano de Construcción Sismo Resistente NSR-10, 2010, págs. H-13)

Esto deja a criterio del diseñador los respectivos análisis que pueda llevar a la conclusión del tipo de cimiento y profundidad, siendo el construir los nuevos cimientos lo más separado posible de los antiguos, la solución más obvia; también, “Para evitar la superposición de esfuerzos, se acostumbra aplicar la siguiente regla empírica: la diferencia de nivel entre dos zapatas adyacentes debe ser menor o igual que la mitad de la distancia libre entre ellas” (Vargas, Interacción Suelo Estructura, 2012). Está establecido que la influencia de una zapata cuadrada es de 2B y de una zapata corrida 3L (Ver

figura 1); No obstante, es progresiva la pérdida de presión con la profundidad, siendo la parte más crítica el primer metro debajo de la zapata (Zett, 2014).

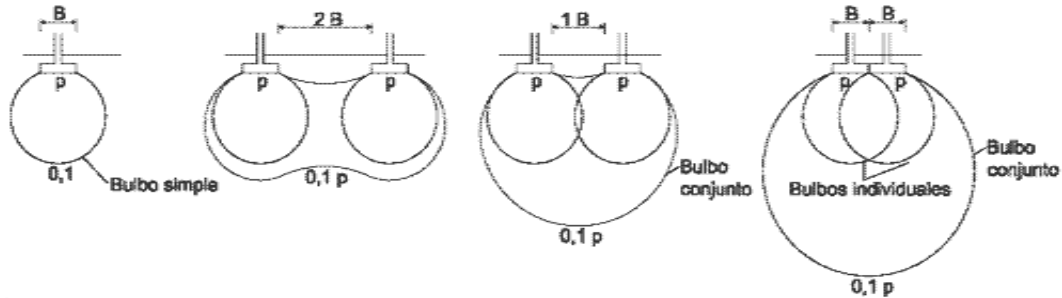


Figura 1: Zona de influencia de una cimentación o bulbo de presiones. (Zett, 2014)

El Reglamento Colombiano de Construcción Sismo Resistente NSR-10. también contempla en el título A, numeral 6.5, el considerar una separación entre estructuras adyacentes por consideraciones sísmicas las cuales, aparte del evaluar los desplazamientos horizontales totales obtenidos para cada una de las porciones de la edificación en la dirección a la junta que los separa, es necesario tener en cuenta también la altura de los pisos, altura de la edificación colindante, niveles de los pisos de la colindancia, separación sísmica de esta o alguna característica topográfica, aclarando además las disposiciones urbanísticas a las que haya lugar (Reglamento Colombiano de Construcción Sismo Resistente NSR-10, 2010). sin embargo, pese a las consideraciones meramente de carácter sísmico, el cual, claro está, es una condición crítica, frente a la separación entre edificaciones vecinas. a lo anterior es pertinente preguntar:

¿Cuáles son los efectos de la interacción entre suelo y el cimiento, por la acción simultánea de estructuras adyacentes?

Para poder dar respuesta al interrogante, se plantea evaluar sistemas estructurales conjuntos en cuanto a la ubicación de dos estructuras vecinas de características similares, y que a partir de un análisis del comportamiento estructura-suelo para tres tipos diferentes de casos en los que se cambian primordialmente los sistemas estructurales conjuntamente (pórticos en concreto, muros de carga y mampostería estructural, teniendo en cuenta la variación en la magnitud del esfuerzo aplicado al suelo por los diferentes sistemas), apoyados sobre un terreno cuyas características sean típicas de suelos blandos cohesivos (los cuales presentan mayor índice de deformabilidad a la acción de cargas, como

el de la Sabana de Bogotá), en situaciones de superposición de esfuerzos, producto de la acción de estructuras adyacentes, se evalúen los efectos del suelo y el cimiento.

Para cimientos superficiales, el análisis y diseño ha estado tradicionalmente ligado al uso de metodologías simplificadas, en donde se acepta la hipótesis de que la variación de esfuerzos en el suelo, obedece a un comportamiento lineal elástico, asumiendo el cimiento como “rígido”. En la figura 2a se puede apreciar la condición idealizada, en donde, como resultado, la presión se toma uniforme, bajo la superficie de contacto del cimiento-suelo, sin embargo, las imágenes 2b y 2c muestran un diagrama de presiones que no describen un comportamiento uniforme y que dependen del tipo de suelo: en la figura 2b, para un suelo no cohesivo, por debajo del eje central de una cimentación superficial, asumiendo que esta es rígida, puede alcanzar una resistencia considerable, en cambio, el suelo en los bordes no la presenta, ya que su magnitud tiende a ser nula en los bordes; y para un suelo cohesivo, el cual corresponde a la figura 2c, el valor de la presión de contacto aumenta parabólicamente en los bordes de la fundación. (Vargas, Interacción suelo estructura, 1998, pág. 17)

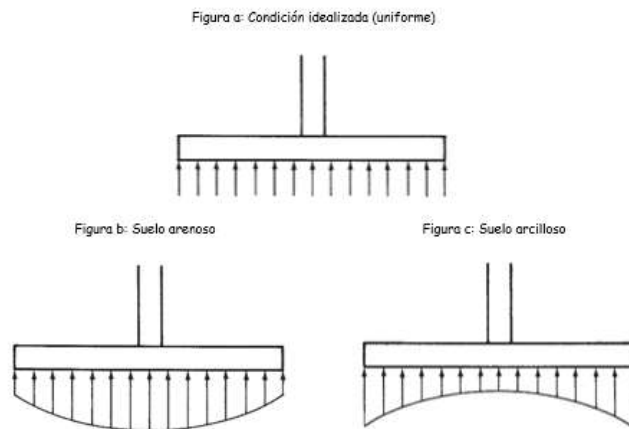


Figura 2: Diagrama de comportamiento de presiones bajo una zapata (Fuente propia)

Considerando el caso de una zapata y teniendo en cuenta la metodología de análisis rígido tradicional, cuando está sometida a carga axial y flexión biaxial; las presiones, debido a la excentricidad generada por los momentos, son diferentes en cada extremo de la zapata; en este caso el diseño basta con revisar que los esfuerzos se encuentren dentro de un rango permitido. En la figura 3 se muestra una zapata con las mismas dimensiones en planta (de 3.20m por 5.50m), variando los espesores, con el propósito de apreciar los cambios en las presiones producidas en el terreno.

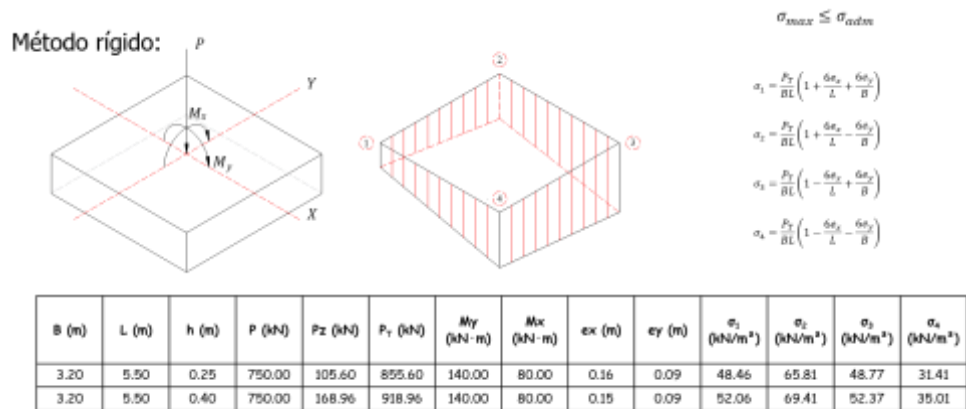


Figura 3: Ejemplo de análisis de presiones bajo una zapata, método rígido. (Fuente propia)

Haciendo una comparación con metodología Interacción Suelo - Estructura (ISE) simulando el suelo como resorte, el cual es una metodología utilizada comúnmente en la ingeniería estructural, en la figura 4, se puede notar la diferencia, en donde se puede apreciar que la variación de los valores de presión, a lo largo del eje de la zapata, no son lineales y se van acercando a este comportamiento al aumentar el espesor del cimiento.

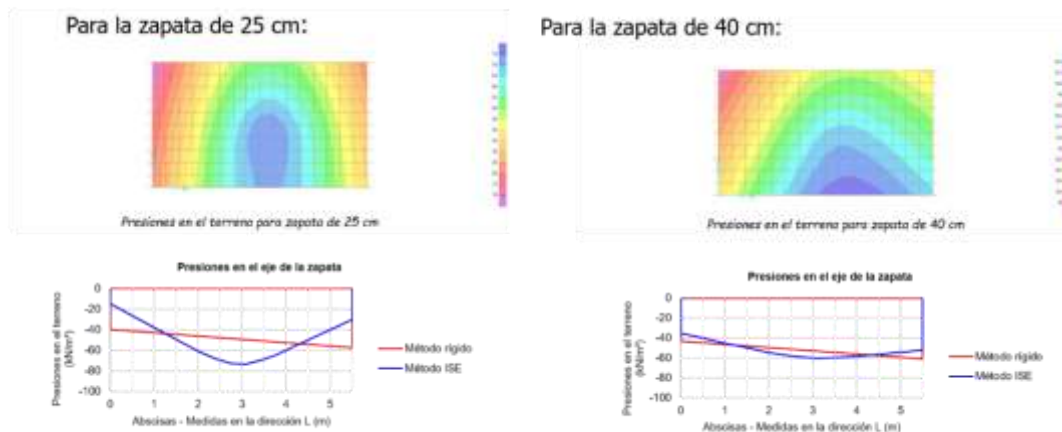


Figura 4: Ejemplo de análisis de presiones bajo una zapata, método ISE tipo Winkler. (Fuente propia)

De acuerdo con lo anterior, es posible evidenciar que el espesor del cimiento influye notablemente en la respuesta del sistema de cimentación (fuerzas cortantes y momentos) y del suelo (diagramas de presión); conviene entonces diseñar cimientos con parámetros de rigidez adecuados, que consideren la interacción entre la estructura y el suelo de cimentación (ISE), con el fin de obtener resultados razonables.

En la ciudad de Bogotá, se han registrado casos, en donde se han presentado fallas en las estructuras de las edificaciones que tienen colindancias con otras, debido a asentamientos diferenciales entre edificios, como es el caso de la calle 96 del barrio Chicó Norte III, en el edificio Axus. (Bedoya, 2019).



Figura 5: Edificios en Chicó Norte. (Bedoya, 2019).

Por lo anterior, es pertinente llevar a cabo la modelación de la interacción entre el suelo y la estructura, el cual describa el comportamiento de los cimientos con el terreno de soporte, para conocer, frente a las consideraciones dichas, los efectos de los esfuerzos y deformaciones generados por la colindancia de las estructuras tipificadas. El análisis es orientado a la ingeniería estructural a nivel detallado, incluyendo el componente geotécnico para la interacción cimiento-suelo.

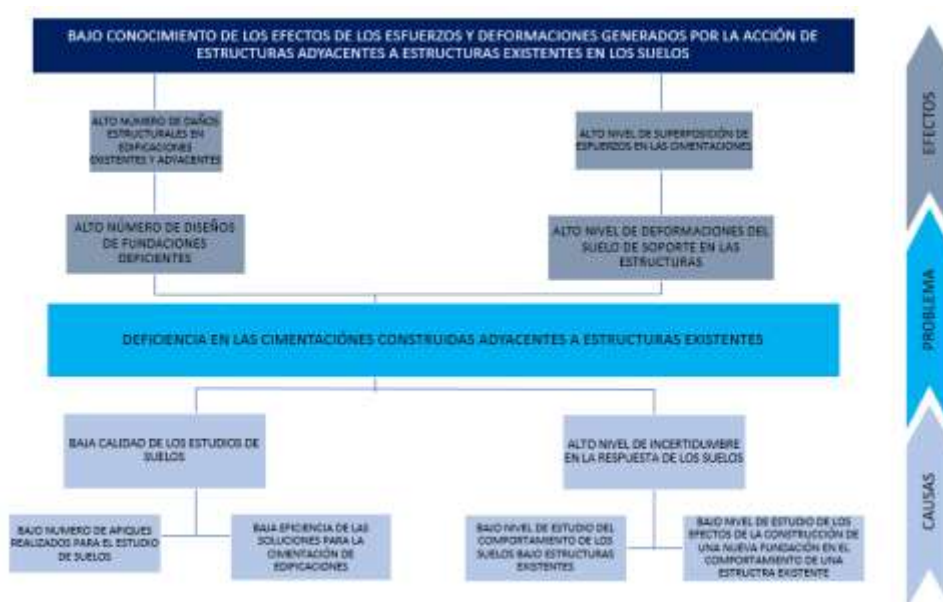


Figura 6: Árbol de problemas (Fuente propia)

2.2. Objetivos:

2.2.1. Objetivo general:

Evaluar los efectos de la interacción suelo-estructura, bajo modelación tipo Winkler y elementos finitos, a la aplicación de cargas simultáneas para el caso de estructuras adyacentes, considerando tres sistemas estructurales.

2.2.2. Objetivos específicos:

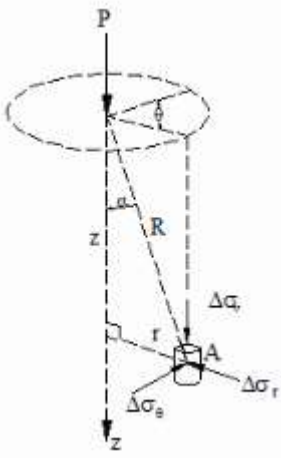
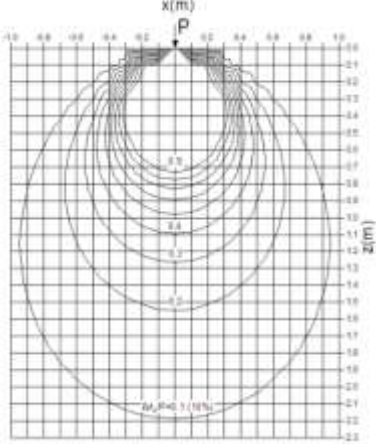
- Analizar los esfuerzos en la base y momentos transmitidos al cimiento para las estructuras tipificadas, definiendo la separación de las edificaciones adyacentes y el tipo de fundación superficial para los tres casos de sistemas estructurales.
- Evaluar el estado de superposición de esfuerzos de los tres casos de estructuras adyacentes, siendo aplicados de forma simultánea, a un estrato de suelo cohesivo.
- Analizar los esfuerzos y deformaciones en la interacción suelo-cimiento, de los tres casos de estructuras adyacentes; determinando sus efectos, en el suelo y el cimiento.
- Comparar y evaluar los esfuerzos y deformaciones del suelo y cimiento, de los tres casos de estructuras adyacentes, para la modelación tipo Winkler y por elementos finitos, considerando las características elásticas del suelo, y la modelación de elementos finitos incluyendo el comportamiento no elástico del suelo; determinando las diferencias de las modelaciones.

3. Marco teórico:

Bajo la acción de un esfuerzo, todo material experimenta una deformación; la naturaleza y magnitud de la deformación depende de la magnitud del esfuerzo aplicado, la trayectoria de esfuerzos, la velocidad de deformación, las propiedades del material y el tiempo (Rodríguez, 2019, pág. 169); Cuando un espécimen de suelo se somete a un cambio en su estado de esfuerzos, su comportamiento mecánico se puede describir mediante una curva esfuerzo-deformación y un criterio de falla. Dicha curva depende de las características y propiedades del suelo, siendo en suelos la ocurrencia de falla o ruptura cuando se rompen los contactos entre partículas o grupo de partículas. La resistencia al esfuerzo cortante de un suelo es el esfuerzo máximo que puede soportar, si se excede la resistencia, la falla ocurre. (Rodríguez, 2019, pág. 211)

Boussinesq (1885) planteó el problema de los esfuerzos en el interior de una masa semi-infinita, producidos por una carga vertical puntual que actúa en su superficie, Boussinesq determinó que la solución para dar respuesta al valor del incremento del esfuerzo vertical en un punto cualquiera con coordenadas cartesianas de localización corresponde a la mostrada en la Tabla 1.

Tabla 1: Planteamiento del problema de los esfuerzos en el interior de una masa semi-infinita

| | | |
|-------------------------------------|--|--|
| $\sigma_v = \frac{3Pz^3}{2\pi R^5}$ |  |  |
| Ecuación | Diagrama de coordenadas | Diagrama del esfuerzo vertical bajo un plano x-z |

Fuente: (Boussinesq, 1885)

Del diagrama del esfuerzo vertical del plano x-z, se obtiene un esquema el cual es utilizado para cualquier valor de carga, el cual es fundamentado en los principios de la elasticidad. En este se observa cómo la distribución de esfuerzos en el terreno debido a una carga puntual, produce unos bulbos de presiones los cuales describen el comportamiento de la zona del suelo donde se producen incrementos de carga vertical considerables por efectos de una carga aplicada. Dichos bulbos están conformados por isóbaras que son las curvas que unen puntos de un mismo valor de presión o esfuerzo, estas representan valores desde el 10% hasta el 90% de la carga vertical, por consiguiente, el valor del esfuerzo cerca de la carga puntual tiene magnitudes cercanas a la carga vertical aplicada y en zonas alejadas a la carga de aplicación esta disminuye hasta que esta es despreciable.

En el caso de una fundación, su función es la de transmitir la acción de las cargas, tanto concentradas o repartidas, sobre el suelo de soporte; considerando esta un incremento de esfuerzo vertical, y teniendo en cuenta que en una estructura se pueden presentar distintos tipos de fundación, (Newmark,

1942) ideó un sistema de solución gráfica para determinar de manera aproximada el incremento debajo de cualquier punto de fundación, con cualquier tipo y forma de carga, basado en la solución para un punto bajo el centro de una fundación con carga uniformemente repartida de forma circular, aplicando el concepto de superposición, a esta solución gráfica se denomina “carta de Newmark”.

Lo anterior mencionado, se centra en el estudio de un medio homogéneo e isotrópico que cumple con la teoría elástica, la cual sería el caso de mantos homogéneos de suelos cohesivos, en donde los resultados de estos análisis han sido razonablemente verificados en pruebas en el terreno y en el laboratorio. (Vargas, Ingeniería de fundaciones, fundamentos e introducción al análisis geotécnico, 1996, pág. 256) Aun así, hay una interdependencia de efectos que se acostumbra denominar interacción fundación-suelo de soporte, cuya incidencia en valores de los esfuerzos y deformaciones en el elemento de fundación, es significativa en un amplio intervalo de rigideces relativas de dicho elemento. Los límites impuestos del intervalo de rigidez intermedia son la completa flexibilidad y la perfecta rigidez, dentro de los cuales la distribución de la presión en el contacto fundación-suelo depende significativamente del mecanismo de interacción fundación-suelo. (Vargas, Interacción suelo estructura, 1998, pág. 14)

Los análisis llevados a cabo hasta el momento ofrecen estudios de interacción suelo-estructura desde un enfoque estático, a partir de dos modelos: el primero basa en el cálculo de estructuras, recurriendo al método del módulo de reacción del terreno o coeficiente de balasto, el cual se fundamenta en el modelo de Winkler (1867) que permite involucrar la respuesta del suelo, simulado por una “cama” de resortes, mediante la Ecuación 1.

Ecuación 1: Coeficiente de balasto según Winkler

$$k_s = \frac{\sigma_{aplicado}}{\delta_{esperada}}$$

Los estudios más pertinentes y mejor conocidos fueron realizados por (Vesic, 1973), quien encontró que los modelos de Winkler representan bastante bien el comportamiento de vigas sobre el suelo; El segundo, modela el suelo en un continuo linealmente elástico isotrópico que requiere de un módulo de Young “E” y la relación de Poisson “v”. De lo anterior, el módulo de reacción no es una propiedad intrínseca del suelo de soporte, como sí lo son los parámetros “E” y “v”.

En la ingeniería geotécnica principalmente, se ha introducido el uso de variadas metodologías, en el documento “Estudio comparativo de métodos de determinación del coeficiente de reacción de subrasante” (Reaction, 2009) resume la evaluación de metodologías, determinando la idoneidad y precisión de ellas para la determinación del coeficiente de reacción de subrasante. Las relaciones comunes para el cálculo del k_s se listan en la Tabla 2.

Tabla 2: Relaciones comunes sugeridas para k_s

| No. | Investigator | Suggested expression |
|-----|--------------------|--|
| 1 | Biot | $k_s = \frac{0.95 E_s}{B(1-\nu_s^2)} \left[\frac{B^4 E_s}{(1-\nu_s^2) EI} \right]^{0.105}$ |
| 2 | Terzaghi | For sands $k_s = k_{s1} \left(\frac{B+l}{2B} \right)^2$ For clays $k_s = k_{s1} \frac{l}{B}$ |
| 3 | Vlassov | $k_s = \frac{E_s(1-\nu_s)}{(1+\nu_s)(1-2\nu_s)} \left(\frac{\mu}{2B} \right)$ |
| 4 | Vesic | $k_s = \frac{0.65 E_s}{B(1-\nu_s^2)} \sqrt{\frac{E_s B^3}{EI}}$ |
| 5 | Meyerhof and Baike | $k_s = \frac{E_s}{B(1-\nu_s^2)}$ |
| 6 | Kloppe and Glock | $k_s = \frac{2E_s}{B(1+\nu_s)}$ |
| 7 | Selvadurai | $k_s = \frac{0.65}{B} \frac{E_s}{1-\nu_s^2}$ |
| 8 | --- | $k_s = \frac{E_s}{B^3(1-\nu_s^2) m l_s l_f}$ |

Fuente: (Gilbert, 2016)

A la incertidumbre de la selección a la mejor metodología y teniendo presente que no hay suficiente información en la literatura técnica sobre la computación, validez y precisión de la aplicación integral de las relaciones en la práctica de la ingeniería, los autores llevaron a cabo, por medio de un estudio de caso de una edificación residencial de 22 pisos en cimiento superficial con características del suelo en Trabiz - Iran, la comparación y análisis de métodos propuestos para la determinación del k_s , siendo evaluados por idoneidad y precisión, comparando los resultados con modelos avanzados utilizando software Safe y Plaxis. Se utilizó el modelo de suelo blando, siendo la característica especial de estos materiales es su alto grado de compresibilidad, la dependencia lineal del esfuerzo de la rigidez del suelo, todas estas características se tienen en cuenta en el modelo de suelo blando, además, se considera la fluencia (compresión secundaria), (Manual de Plaxis). Finalmente, el documento valida la relación de Winkler con una precisión de contacto mayor que los valores reales, por no tener en cuenta el efecto de presiones laterales de la masa del suelo, además de afirmar que la relación de Vesic y el modelo de suelo blando son los más acertados para la condición de suelo-cimiento evaluada en la investigación. (Reaction, 2009).

Se han llevado a cabo estudios experimentales bajo trabajos de grado, en los que se encontraron dos tipos de comportamientos para la fundación para zapatas aisladas: el primero corresponde a las deformaciones en un rango elástico encontrado bajo una cama de resortes y el segundo a las deformaciones en el rango inelástico encontrados en terreno (recebo), el cual se comparó con modelación por elementos finitos y se pudo comprobar una similitud a lo encontrado en los ensayos experimentales, en donde se presentaron deformaciones generando bulbos de presiones en una matriz definida de terreno. (Sandoval, 2015)

La modelación mediante elementos finitos elásticos tridimensionales, ofrece una solución acertada en términos en los que al discretizar geoméricamente la estructura de fundación y el suelo, por medio de las matrices individuales de rigidez para los elementos, solucionan un sistema de ecuaciones para obtener desplazamientos en los puntos nodales del esqueleto de elementos, en donde, a partir de estas deflexiones se pueden calcular los esfuerzos y deformaciones necesarios para un diseño (Vargas, Interacción Suelo Estructura, 2012). En el trabajo llevado a cabo por (Gilbert, 2016), la modelación antes referida, se llevó a cabo mediante el programa SAP2000 V23.1.0 utilizando elementos tipo SOLID, hexaedros, con 8 nodos y 3 grados de libertad por nodo, a estos se les asigna el material en donde se introducen las características elásticas (E , ν , G), para el suelo, y para la estructura (fundación) se discretiza utilizando elementos tipo SHELL. La modelación ya ha sido utilizada en diferentes estudios, uno de ellos es la modelación de una solera, el cual permitió verificar el comportamiento de la interacción entre estructura y suelo, revelando que: en modelos por elementos finitos, los resultados resultan menos conservadores que utilizando modelos con el coeficiente de balasto; sin embargo, tienen gran similitud en sus resultados.

El concepto de módulo de reacción de subrasante ha sido especialmente acogido por la ingeniería estructural al encontrar en este, la representación al comportamiento del suelo que soporta las estructuras mediante resortes elásticos, siendo esta consideración, supeditada a correlaciones empíricas. Por lo anterior, investigaciones han llevado a cabo enfoques dedicados a la estimación de valores de reacción de subrasante para varios tipos de cimentación. Poulos (2018) indica que el módulo de reacción (k) no es una propiedad fundamental del suelo ya que varía con el tipo de cimentación, dimensión y tipo de carga, su relación está estrechamente ligada al módulo de Young y las dimensiones de la cimentación. El documento se amplía a la evaluación de cimentaciones profundas, siendo determinante el tomar en cuenta el efecto de grupo, sin embargo, en ambos casos (cimentaciones superficiales y profundas) se debe distinguir entre el módulo de reacción de la

subrasante (k) y la rigidez del resorte; adicionalmente, dentro del enfoque llevado a cabo por Harry G. Poulos, se encuentra el considerar el efecto que tiene la excavación, en el caso de sótanos lo cual se lleva a cabo antes de la construcción de un edificio, en la ocurrencia de la excavación, el comportamiento del suelo tenderá a ser más rígido que si no se hubiese excavado, además se debe considerar el nivel freático por levantamiento hidrostático, el cual reducirá la carga neta en la fundación.

En la ingeniería estructural se acostumbra pedir al ingeniero geotecnista los valores de la rigidez del resorte para los elementos de la cimentación, y como lo afirma Poulos (2018), es necesario distinguir entre el módulo de reacción de la subrasante y la rigidez del resorte; ya que: si el ancho o diámetro de la cimentación es “ d ”, y una longitud elemental “ d ” se considera la base de “ ΔL ”, entonces la rigidez del resorte “ K ” para ese elemento se puede calcular a partir del módulo relevante de reacción de subrasante, “ k ”, como: “ $K=k d \Delta L$ ”, “ K ” tendrá entonces las unidades de rigidez (fuerza por unidad de longitud, para ejemplo MN / m), mientras que “ k ” tiene las unidades de fuerza por longitud al cubo, por ejemplo MPa / m o MN / m³.

Se han tomado en los diseños de cimentaciones, el análisis de superposición como evaluación independiente, y el carácter geotécnico, en la realidad ingenieril de obras de infraestructura, se ha regido a que el Reglamento Colombiano de Construcción Sismo Resistente NSR-10. en el título H.4, Generalidades, menciona que: “En los cálculos se tendrá en cuenta la interacción entre los diferentes elementos de la cimentación de la estructura y de las edificaciones vecinas, como analizar si hay superposición de bulbos de carga, los efectos de los sótanos, las excentricidades de los centros de gravedad y de cargas que en conjunto se ocasionan”, dejando a criterio del ingeniero geotecnista dicha evaluación y teniendo en cuenta lo contemplado en el título A, numeral 6.5, el considerar una separación entre estructuras adyacentes por consideraciones sísmicas, tomado de los análisis y evaluaciones de la ingeniería estructural.

Los problemas por la interacción entre estructuras vecinas son comunes y se han presentado en diferentes partes del mundo, como lo es el caso de la catedral metropolitana de la Ciudad de México, México, la cual fue construida en el siglo XVI sobre arcillas lacustres extremadamente blandas de los restos antiguos “Tenochtitlan: la capital lacustre del imperio azteca”. La catedral ha experimentado asentamientos de más de 1.5m que han afectado la estabilidad del edificio, así como también los adyacentes, el cual corresponde a la parroquia metropolitana de El Sagrario, con más de 0.5m, y estos

asentamientos siguen en aumento, a pesar de los esfuerzos por mitigar esta condición. Los problemas ligados a dicho comportamiento, radican primeramente por consecuencia de la consolidación de la arcilla blanda además de la sobreexplotación de acuíferos profundos y la rápida caída del nivel del agua subterránea (razón de problemas comunes de asentamientos en toda la zona); adicionalmente las estructuras se encuentran sobre donde antiguamente se apoyaba la pirámide más grande y pesada del imperio Azteca, presentándose entonces los efectos de esta historia de carga en el suelo; sin embargo, la interacción entre las estructuras vecinas explicaría los asentamientos diferenciales que ambas edificaciones (La Catedral y La Parroquia) están presentando. Se analizó esta situación, simulando dos silos, los cuales corresponden a otro escenario real, el cual tiene unas condiciones y dimensiones específicas, tanto de la estructura, como del suelo (ver figura 7).

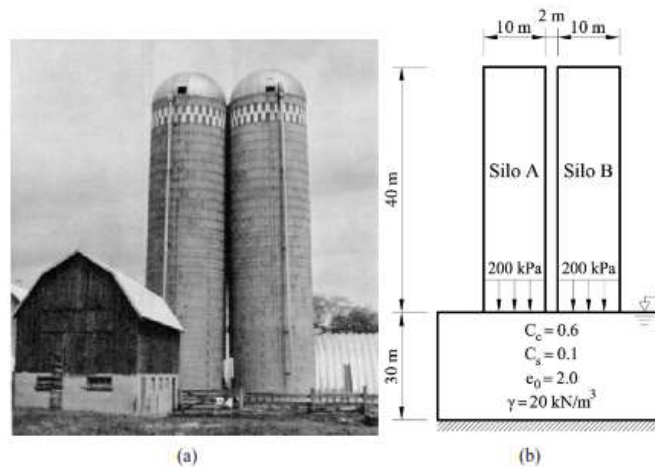


Figura 7: Dos silos vecinos: (a) un caso de falla (Bozozuk, 1976; © NRC Canada); (segundo)

En el análisis llevado a cabo en las estructuras de silo, bajo tres escenarios: 1) Los silos A y B se construyen simultáneamente; 2) El Silo B se construye después del Silo A; 3) El silo B se construye después de que se construye y retira el silo A; y aplicando las teorías de superposición de esfuerzos, se determinaron los asentamientos que, en cada caso, dan a lugar.

Los resultados del análisis anterior se resumen en la Figura 8: El comportamiento es simétrico a los asentamientos diferenciales $\Delta = 33$ cm en el escenario 1. y se explican mediante superposición de los bulbos de tensión debajo y fuera de las zapatas; El escenario 2, sin embargo, produce asentamientos diferenciales asimétricos que, a primera vista, no son obvias, la asimetría aquí tiene una explicación simple: Silo B está construido sobre un terreno nivelado y sus asentamientos no incluyen el terreno deflexiones que ocurrieron antes de su construcción, el suelo que experimenta un mayor esfuerzo inicial en el momento antes de la carga, es más denso y por lo tanto, menos compresible; este último

es válido también para el escenario 3 con una importante diferencia, ya que en este caso, en el momento antes de la carga, la tensión bajo el Silo B es uniforme, pero el suelo tiene una historia de esfuerzos más grandes más cerca de donde el Silo A, por lo tanto, es más denso y menos compresible en ese lado, sorprendentemente, este escenario produce los mayores asentamientos diferenciales; adicional a lo anterior, se identificó que aumentar la distancia entre los silos en solo 1m, reduciría los asentamientos diferenciales en casi un 30%.

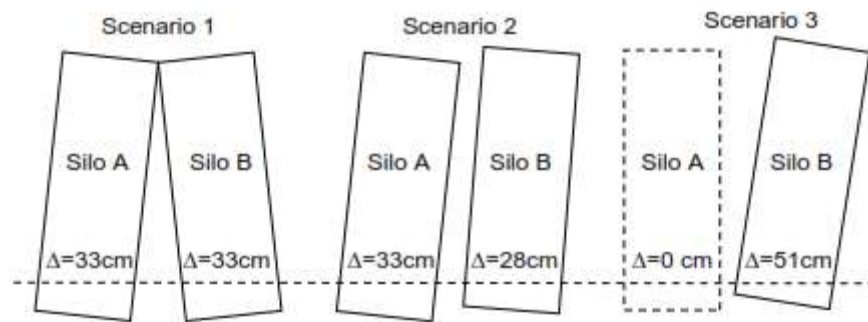


Figura 8: Resumen del ejemplo de interacción del silo (Bozozuk, 1976; © NRC Canada);

Teniendo en cuenta el análisis del silo, fue posible analizar de manera simplificada la Catedral y El Sagrario, del cual se discutió que el modelo geotécnico simplificado del problema de la Ciudad de México, no puede afirmar la predicción exacta del diferencial asentamientos. Por ello, se centró solo en los efectos de la interacción de los vecinos estructuras, historial de carga y la caída global y local en el nivel del agua subterránea, siendo el último factor , el que probablemente ha sido responsable de mucho más de lo previsto en los asentamientos diferenciales de El Sagrario, el diferencial más pequeño de lo previsto los asentamientos de la Catedral pueden atribuirse a las medidas correctivas llevadas a cabo durante su construcción y posteriormente para mitigar la situación a lo largo de los años (Puzrin, 2010).

El diseño de las fundaciones, al depender directamente de la distribución de presiones reactivas de contacto a lo largo del elemento de fundación, es esencial, determinar una distribución adecuada de presiones de contacto. Para el caso en el que se encuentren dos edificaciones colindantes, las presiones generadas por cada uno de estas estructuras, siendo cada una totalmente independiente, podría generar superposición de esfuerzos que se encuentran descritos antes como bulbos de presiones superpuestos en cierta medida y que, hasta el momento, está situación no ha sido analizada.

4. Metodología:

A partir del proyecto arquitectónico de un par de edificaciones de (5) pisos, localizado en la ciudad de Bogotá, destinado para uso residencial; con sistemas estructurales para el par, según el análisis: pórticos en concreto (PRM), muros de carga, y mampostería estructural. Se definió el sistema estructural previo predimensionamiento, el sistema de entrepiso y cubierta a emplear, se procedió a realizar el respectivo análisis de cargas gravitacionales (cargas muertas, cargas vivas, etc), según clasificación del título B de NSR-10. Seguidamente, se realizó la modelación del edificio en un programa de análisis estructural de uso comercial (en la elaboración del presente proyecto, se utilizó SAP2000 V23.1.0 y ETABS V19.0.0 en el proceso de modelación estructural de las edificaciones y de la cimentación) y se aplicaron las cargas calculadas previamente.

Para el presente trabajo, se realizó análisis sísmico únicamente de la edificación ya que el análisis de la cimentación será estático y no dinámico, dicho análisis modal espectral se realizó de acuerdo con el capítulo A.5 de NSR-10. El movimiento sísmico de diseño, correspondiente al espectro elástico de aceleraciones, se obtuvo con base en los parámetros sísmicos de los edificios, obtenidos de acuerdo con la clasificación de la estructura en la zona de amenaza sísmica intermedia (correspondiente a la zona de localización del análisis), el cual es establecido en los mapas de aceleraciones pico espectrales del terreno en el Título A de NSR-10 y la clasificación del suelo, según datos geotécnicos típicos de la ciudad. Una vez calculadas las cargas gravitacionales y laterales actuantes en las estructuras, se procedió a aplicar dichas fuerzas sobre el modelo matemático del edificio y posteriormente se ejecutó el análisis estructural con base en los requisitos contemplados en la NSR-10.

Por medio del análisis estructural, se obtuvo la fuerza sísmica cortante en la base del edificio, calculada con el análisis modal espectral, comparada y ajustada con método de la fuerza horizontal equivalente, dando como resultado los valores de fuerzas internas en los elementos (vigas y columnas) y los desplazamientos laterales de la estructura, generados por el desplazamiento en la base de la edificación. Posteriormente, se revisaron los desplazamientos máximos, los cuales se encontraron por debajo de los valores máximos permitidos por el Capítulo A.6 – Derivas, de NSR-10 y también, se revisó que los elementos que conforman el sistema de resistencia sísmica, como las columnas y las vigas de concreto reforzado, cumplan con los requisitos de resistencia y deformaciones permitidos; Lo anterior, para cada par de edificios en cada uno de sus sistemas, con el fin de determinar la separación de las estructuras que se plantearon adyacentes; para los tres casos, se tomó la distancia

más desfavorable que corresponde al análisis del sistema de pórticos, el cual es la estructura menos rígida.

Con el modelo de la superestructura resuelto y obtenidas las cargas transmitidas por los edificios al suelo de cimentación, para el cual previamente con los datos de un estudio geotécnico, de un predio localizado en la carrera 13 No 10-83/85/91 sector de San Victorino, Bogotá D.C. En el estudio geotécnico, de la exploración del suelo realizada manualmente en 4 sondeos, se extrajeron muestras alteradas e inalteradas y se hicieron los ensayos físicos y mecánicos tales como límites de Atterberg, humedades, compresiones inconfiadas etc; se encontraron los siguientes estratos: Baldosa y placa en concreto, hasta profundidades de 0.15, 0.14, 0.10 y 0.12 metros, Relleno en limo arcillosos mezclado con escombros, hasta profundidades de 0.40. 0.50. 0.55 y 0.60 metros: MH, Limo arcilloso orgánico color gris con vetas cafés de alta compresibilidad, hasta profundidades de 1.40. 1.60. 1.80 y 1.70 metros: MH. Arcilla arenosa en matriz gravosa color habano grisácea con vetas amarillas de oxidación de humedad y plasticidad media alta consistencia media a blanda, hasta profundidades de 5.00. 5.20. 5.30 y 5.28 metros: Arcilla color gris de humedad y plasticidad media alta consistencia media a blanda, hasta profundidades de 15.10. 15.20. 15.12 y 15.60 metros: CH; el nivel freático se ubica entre 2.20m y 2.62m. Los demás datos se encuentran contemplados en el estudio en mención y los estudios complementarios (BOGOTA, 2016).

Con los datos del estudio de suelo y las cargas resultantes del análisis estructural, se planteó como sistema de cimentación para cada sistema: cimentación superficial por medio de losas. Lo anterior, bajo el análisis realizado para cada caso respectivamente: pórticos en concreto, muros de carga, y muros en mampostería estructural.

Las cimentaciones y el suelo, de los dos pares de edificios colindantes, fueron modelados y analizados en los programas: SAP2000 V23.1.0 y ETABS V19.0.0 (de uso común estructural), y el programa MIDAS GTS NX V20 2.1 (de uso geotécnico) con el fin de incluir el comportamiento no elástico del suelo.

El primer análisis matemático se realizó bajo la metodología de fundación elástica simplificada, comúnmente conocido como el método de Winkler, en la cual, el suelo sobre el que se apoya el cimiento, se idealiza como una cama de resortes independientes (que representan el terreno), colocados bajo la cimentación en cuestión, empleando para el suelo un coeficiente de rigidez igual a

k_s =esfuerzo aplicado/deformación esperada. Lo anterior, para los tres casos de estructuras tipificadas, siendo tres (3) modelos matemáticos.

El segundo análisis matemático, se llevó a cabo por la metodología de los elementos finitos, modelando un volumen importante del terreno, empleando el programa MIDAS GTS NX V20 2.1. Se empleó el modelo constitutivo para suelo blando – Soft Soil, el cual es apropiado para arcillas, arcillas limosas y turbas normalmente consolidadas o ligeramente sobre consolidadas, con un alto grado de compresibilidad; las principales características del modelo constitutivo son:

- Las trayectorias de esfuerzo dependen de la rigidez del suelo
- Se hace la distinción entre la etapa de carga primaria y la etapa de carga y descarga
- Se tiene en cuenta la historia de pre-consolidación del suelo.
- Se usa el criterio de falla del modelo Mohr Coulomb modificado

En este modelo se asume que hay una relación logarítmica entre la deformación volumétrica (ϵ_v) y el esfuerzo efectivo promedio (p'), que se puede formular bajo la ecuación 2.

Ecuación 2: Deformación volumétrica del modelo Soft-Soil

$$\epsilon_v - \epsilon_v^0 = \lambda^* \ln\left(\frac{p'}{p^0}\right) - \text{Compresión virgen}$$

Donde λ^* es el índice de compresibilidad modificado, el cual está en función del coeficiente de compresibilidad del ensayo de consolidación (Ver ecuación 3).

Ecuación 3: Índice de compresibilidad modificado

$$\lambda^* = \frac{C_c}{2.303 * (1 + e_0)}$$

Por otra parte, durante el proceso de descarga y recarga se presenta una trayectoria diferente, la cual, tiene la siguiente formulación:

Ecuación 4: Trayectoria de deformación volumétrica durante el proceso de descarga y recarga

$$\epsilon_v^e - \epsilon_v^{e0} = \kappa^* \ln\left(\frac{p'}{p^0}\right) - \text{descarga y recarga}$$

Donde κ^* es el índice de recompresión modificado, el cual está en función del coeficiente de recompresión del ensayo de consolidación, así:

Ecuación 5: Índice de recompresión modificado

$$\kappa^* = \frac{C_r}{2.303 * (1 + e_0)}$$

El comportamiento elástico del material se describe con la ley de Hooke, asumiendo que hay una recuperación del material deformado (siguiendo la teoría de pequeñas deformaciones) y presenta una dependencia lineal entre esfuerzo y el módulo de Bulk así (se resalta que el subíndice “ur” hace referencia a la condición de recarga y descarga):

Ecuación 6: Condición de recarga y descarga

$$K_{ur} = \frac{E_{ur}}{3(1 - 2\nu_{ur})} = \frac{p'}{\kappa}$$

Cabe resaltar, que el parámetro κ no es una propiedad intrínseca del suelo, dado que depende del proceso de descarga y recarga que se le aplique; por tal razón, el modelo considera un valor particular de esfuerzo isotrópico que es el esfuerzo de pre-consolidación (p_p); por lo anterior, durante la etapa de descarga y recarga (parte elástica) se mantiene constante el p_p del suelo, mientras que en la etapa de carga primaria, el p_p incrementa con el nivel de esfuerzo causando deformaciones plásticas (Ver ilustración 9).

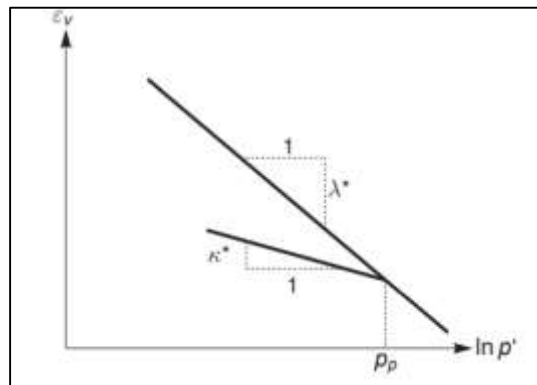


Ilustración 9: Relación logarítmica entre la deformación volumétrica y el esfuerzo efectivo promedio

Lo anterior, para los tres casos de estructuras tipificadas, empleando así dos (2) modelos matemáticos por interacción suelo – estructura.

Para definir el volumen de terreno a modelar, se evaluó, bajo el planteamiento propuesto por Boussinesq, en el que los esfuerzos en el interior de una masa semi-infinita, producidos por una carga que actúa en su superficie se distribuyen en el suelo de forma vertical y horizontal, generando bulbos de esfuerzos para la carga en cuestión, para ambos casos, se tomaran hasta la profundidad de influencia de la cimentación que se da a cinco veces el ancho de la cimentación, 5B. (Bowles, 1996)

Para los seis (6) modelos matemáticos, se analizó el comportamiento del terreno y del cimiento a través de los desplazamientos resultantes, presiones actuantes, esfuerzos en los elementos, los valores de fuerzas cortantes, momentos de flexión, cargas axiales y demás variables. Esto con el fin de obtener resultados de los efectos de los esfuerzos y deformaciones de cada medio en la interacción entre el suelo-cimiento, en donde se realizó una evaluación entre los resultados de las dos (2) metodologías, para las condiciones resultantes para cada sistema estructural del par de edificaciones colindantes.

5. Resultados y análisis:

5.1. Geometría de la edificación:

La estructura analizada consta de 5 pisos, con una altura total de 15 m, cada piso corresponde a 3 m, en el cual, consta de la misma distribución que el primero, con sección de 14.14 m por 16.64 m, para un total de 235.3 m² aproximadamente, como se muestra a continuación (Ver figura 09 y 10):

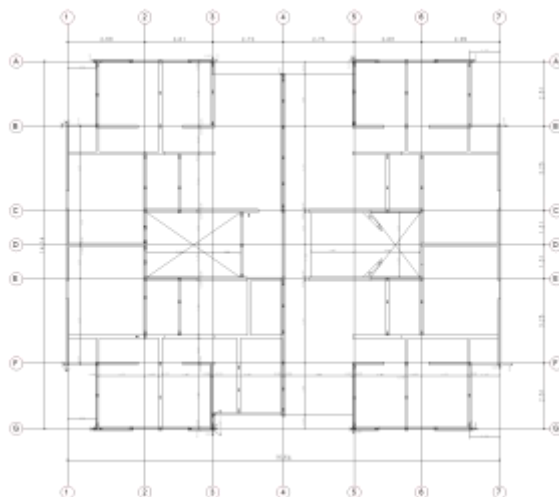


Figura 10. Planta arquitectónica edificación analizada (fuente propia)

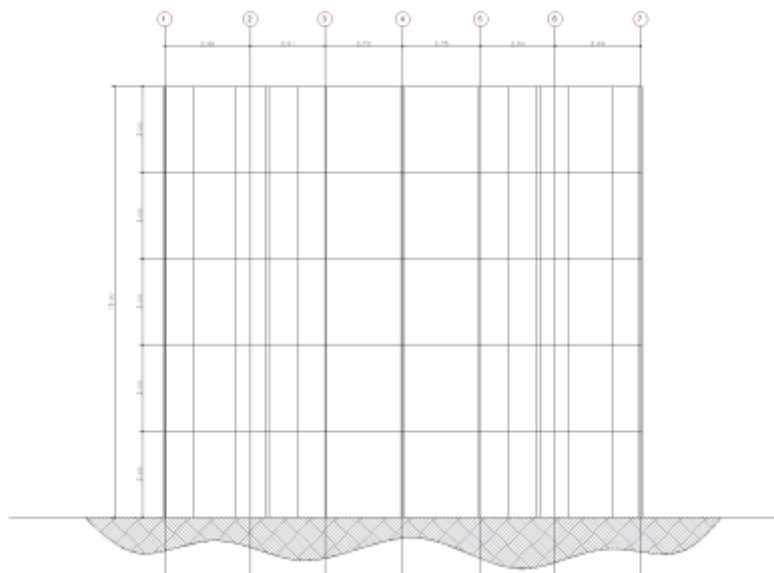


Figura 11: Esquema fachada arquitectónica edificación analizada (fuente propia)

5.2. Determinación de los parámetros de las estructuras:

5.2.1. Espectro de diseño:

Se llevó a cabo el análisis estructural de las estructuras, teniendo en cuenta la verificación y cumplimiento de todos los parámetros según NSR-10. para cada tipo de sistema estructural: pórticos en concreto, muros de carga, mampostería, De acuerdo con el título A.3.2 “tipos de sistemas estructurales”, para cada par de edificaciones adyacentes.

Se han ubicado las estructuras adyacentes en la ciudad de Bogotá D.C. Para determinar los parámetros, se utilizarán datos de proyecto “construcción edificio en seis pisos y sótano con destino comercial ubicado en carrera 13 No 10-83/85/91 sector de San Victorino (Ver anexo 01). En la exploración del suelo realizada manualmente en 4 sondeos, se extrajeron muestras alteradas e inalteradas y se hicieron los ensayos físicos y mecánicos, de lo cual, se toman los parámetros generales listados en la Tabla 3:

Tabla 3: Datos generales y Espectro de diseño

| | | |
|----------------|-----------------------|--|
| Lugar: | Bogotá – Cundinamarca | |
| Zona: | <u>Intermedia</u> | Zona de amenaza sísmica |
| Tipo suelo: | <u>D</u> | |
| Cod municipio: | <u>11001</u> | (Apéndice A-4 NSR-10) |
| Aa: | <u>0.15</u> | Coefficiente de aceleración horizontal pico efectiva |
| Av: | <u>0.2</u> | Coefficiente de velocidad horizontal pido efectiva |

| | | |
|------------------------------------|--------------|--|
| Ae: | 0.13 | |
| Ad: | 0.06 | |
| Grupo | I - normal | Grupo de ocupación (Tabla A.2.5.1 NSR-10) |
| Coefficiente | 1 | Coefficiente de importancia (Tabla A.2.5.1 NSR-10) |
| Ubicación | Piedemonte B | Decreto 523 de 6 de diciembre de 2010. Microzonificación sísmica de Bogotá D.C. - Tabla 3 |
| Fa | 1.95 | NSR-10 Tabla A.2.4-3 ; Decreto 523 de 6 de diciembre de 2010. Microzonificación sísmica de Bogotá D.C. - Tabla 3 |
| Fv | 1.7 | NSR-10 Tabla A.2.4-3 ; Decreto 523 de 6 de diciembre de 2010. Microzonificación sísmica de Bogotá D.C. - Tabla 3 |
| Capacidad de disipación de energía | DMO | Capacidad moderada de disipación de energía |
| Análisis sísmico | FHE | Fuerza horizontal equivalente |

(Fuente propia)

Las estructuras fueron modeladas en programas de análisis sísmico ETABS V19.0.0 19 y SAP2000 V23.1.0 v20. de los cuales se realiza directamente el análisis sísmico, utilizando las fuerzas elásticas de diseño con los parámetros anteriores, De acuerdo con lo estipulado en la NSR-10. literal A.2.6 “Espectro de diseño” (ver la Figura 11).

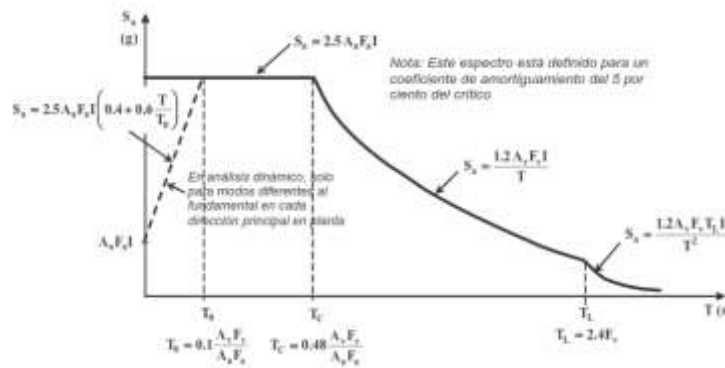


Figura 12: Espectro de diseño (Reglamento Colombiano de Construcción Sismo Resistente NSR-10, 2010, págs. A-27)

5.2.2. Materiales:

5.2.2.1. Concreto reforzado

5.2.2.1.1. Resistencia a la compresión del concreto

La resistencia nominal a la compresión del concreto utilizado para las edificaciones, es:

$$f'c = 21 \text{ MPa (210 kg/cm}^2\text{)}$$

$$f'c = 28 \text{ MPa (280 kg/cm}^2\text{)}$$

5.2.2.1.2. Módulo de elasticidad del concreto

El módulo de elasticidad del concreto, E_c , depende de la resistencia nominal a la compresión y se calculó en MPa con la siguiente ecuación:

$$E_c = 4700\sqrt{f'c}$$

$$E_c = 21.538.1 \text{ MPa} - \text{para } f'c = 21\text{MPa}$$

$$E_c = 24,870.1 \text{ MPa} - \text{para } f'c = 28\text{MPa}$$

5.2.2.1.3. Coeficiente de Poisson

Se ha empleado un coeficiente de Poisson típico del concreto igual a 0.20. $\nu = 0.20$

5.2.2.1.4. Módulo de cortante

El módulo de cortante G se obtiene con la siguiente ecuación:

$$G = \frac{E}{2(1 + \nu)} = G = 8,974.210 \text{ MPa} - \text{para } f'c = 21\text{MPa}$$

$$G = \frac{E}{2(1 + \nu)} = G = 10.362.527 \text{ MPa} - \text{para } f'c = 28\text{MPa}$$

5.2.2.2. Acero de refuerzo

Resistencia a la cedencia del acero

5.2.2.2.1. La resistencia a la fluencia o cedencia del acero, es:

$$F_y = 420 \text{ MPa (4200 kg/cm}^2\text{)}$$

5.2.2.2.2. Módulo de elasticidad del acero

El módulo de elasticidad del acero, en MPa, es:

$$E = 200.000 \text{ MPa}$$

5.2.2.3. Mampostería

Se emplea para el diseño de la edificación en sistema de muros en mampostería reforzada, ladrillo estructural perforación vertical medio fachada rojo RE 0012, el cual tiene las siguientes dimensiones:



Figura 13: Esquema dimensiones de ladrillo estructural (fuente propia)

5.2.2.3.1. Resistencia específica a la compresión de la unidad de mampostería

$$F'_{cu} = 40 \text{ MPa}$$

5.2.2.3.2. Resistencia específica a la compresión del mortero de pega

De acuerdo con lo contemplado en la NSR-10. Tabla D.3.4-1 “clasificación de los morteros de pega por propiedad o por proporción”, se ha escogido el mortero tipo S. Por lo cual, la resistencia específica a la compresión del mortero de pega es:

$$F'_{cp} = 12.5 \text{ MPa}$$

5.2.2.3.3. Resistencia a la compresión del mortero de relleno

$$F'_{cr} = 14 \text{ MPa}$$

5.2.2.3.4. Resistencia nominal a la compresión de la mampostería

Se hizo la estimación de la resistencia nominal a la compresión de la mampostería, basada en la resistencia de los materiales antes indicados, y aplicando los parámetros definidos bajo la NSR-10. título D, numeral 3.7.

$$F'_m = 11.15 \text{ MPa}$$

5.2.2.3.5. Módulo de elasticidad de la mampostería

Para unidades de arcilla:

$$E_m = 750 \times F'_m = 8363 \text{ MPa} < 20000 \text{ MPa}$$

5.2.3. Evaluación de cargas:

5.2.3.1. Carga muerta (DL):

El sistema de entrepiso de los edificios en sistema de pórtico, está compuesto por una placa aligerada de 0.40m de altura, viguetas de 0.10m de espesor y separación de 1.00m, formada por viguetas y losetas de concreto reforzado. Las cargas consideradas y aplicadas a las estructuras son:

Tabla 4: Resumen carga muerta por m² de losa aligerada de entrepiso

| Descripcion | peso |
|---------------------------|------------------------------|
| Loseta superior | 1.20 kN/m ² |
| Viguetas | 0.77 kN/m ² |
| Pisos y acabados | 1.00 kN/m ² |
| Cielo raso | 0.50 kN/m ² |
| Muros divisorios | 1.50 kN/m ² |
| Otras cargas | 0.50 kN/m ² |
| Total carga muerta | 5.47 kN/m² |

(Fuente: NSR-10. Tabla B.3.4.3-1)

Para el caso del sistema estructural en mampostería reforzada y muros de carga, se consideró una placa maciza de espesor 0.12m, las demás cargas son asumidas como se indican en la Tabla 4:

Tabla 5: Carga muerta por m² de losa maciza de entrepiso

| Descripcion | peso |
|---------------------|------------------------|
| Placa maciza e:12cm | 2.88 kN/m ² |

(Fuente propia)

5.2.3.2. Carga viva (LL):

La ocupación y uso para carga viva, fue tomado De acuerdo con la Tabla B.4.2.1-1. correspondiente al uso residencial:

Tabla 6: Carga muerta por m² de losa de entrepiso

| Uso | Carga |
|---|------------------------|
| Residencial – Balcones | 5.00 kN/m ² |
| Residencial - Cuartos privados y sus corredores | 1.80 kN/m ² |
| Residencial – Escaleras | 3.00 kN/m ² |
| Reunión - Corredores y escaleras | 5.00 kN/m ² |

(Fuente: NSR-10. Tabla B.4.2.1-1)

5.3. Modelos matemáticos de las estructuras:

Por medio del análisis estructural, se pudo obtener la fuerza sísmica cortante en la base de los edificios, calculada para cada estructura, con el análisis modal espectral y comparada y ajustada con método de la fuerza horizontal equivalente. Se obtuvieron los valores de fuerzas internas en los elementos (vigas, columnas y muros) y los desplazamientos laterales de la estructura, generados por el desplazamiento en la base de la edificación. Se revisó que los desplazamientos máximos estén por debajo de los valores máximos permitidos por el Capítulo A.6 – Derivas, de NSR-10 y también, que los elementos que conforman el sistema de resistencia sísmica, como las columnas, las vigas de concreto reforzado, muros en concreto y mampostería reforzada, cumplan con los requisitos de resistencia y deformaciones permitidos. Lo anterior, para cada par de edificios en cada uno de sus sistemas. Para el caso de las edificaciones analizadas, la deriva máxima expresada en porcentaje de la altura de piso es del 1%, de acuerdo con los lineamientos de la NSR-10 (ver Tabla 7).

Tabla 7: Derivas máximas como porcentaje de h_{pi}

| Estructuras de: | Deriva máxima |
|--|---|
| concreto reforzado, metálicas, de madera, y de mampostería que cumplen los requisitos de A.6.4.2.2 | 1.0% ($\Delta_{max}^i \leq 0.010 h_{pi}$) |
| de mampostería que cumplen los requisitos de A.6.4.2.3 | 0.5% ($\Delta_{max}^i \leq 0.005 h_{pi}$) |

(Fuente: (Reglamento Colombiano de Construcción Sismo Resistente NSR-10, 2010, págs. A-76))

A continuación, se presentan los valores de desplazamientos máximos permitidos, de acuerdo con la geometría del edificio (ver Tabla 8).

Tabla 8: Valores de deriva máximos permitidos en los niveles de la estructura

| Nivel | H total (m) | Δ_H (m) | Δ_{max} |
|--------------|--------------------|----------------------------------|----------------------------------|
| Piso 5 | 15.00 | 3.00 | 0.030 |
| Piso 4 | 12.00 | 3.00 | 0.030 |
| Piso 3 | 9.00 | 3.00 | 0.030 |
| Piso 2 | 6.00 | 3.00 | 0.030 |
| Piso 1 | 3.00 | 3.00 | 0.030 |
| Base | 0.00 | 0.00 | 0.000 |

(Fuente propia)

5.3.1. Edificación en sistema de pórtico:

En la Figura 14, se muestra el modelo del edificio en sistema de pórtico, realizado mediante el programa ETABS V19.0.0 para la evaluación de cargas del edificio:

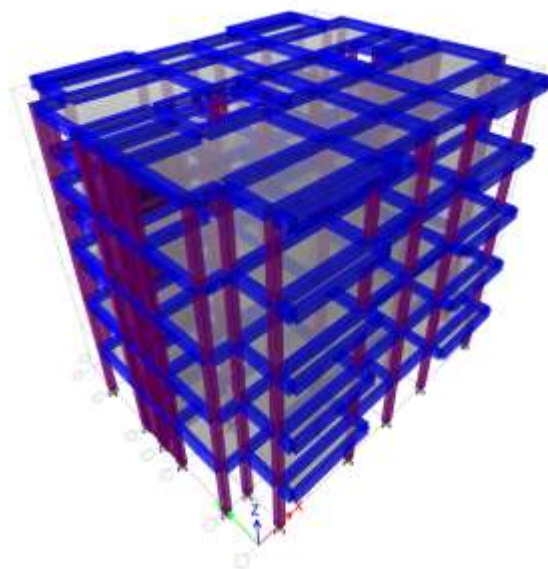


Figura 14: Modelo 3D ETABS V19.0.0 edificio Sistema de porticos.

Para la estructura analizada, los valores del periodo fundamental, de acuerdo con la NSR-10. sección A-4 “método de la fuerza horizontal equivalente” son los siguientes:

Periodo Fundamental (A.4.2.2)

| | | |
|----------|---------------|--|
| Ct | <u>0.047</u> | Tabla A.4.2-1 |
| h | <u>15</u> | Altura del edificio |
| α | <u>0.9</u> | Tabla A.4.2-1 |
| Ta | <u>0.54</u> | Periodo fundamental |
| k | <u>1.02</u> | A.4.3.2 |
| | | Aceleración - Periodo fundamental (ETABS |
| Sa | <u>0.7312</u> | V19.0.0) |

El cálculo de las fuerzas sísmicas equivalentes para el edificio con sistema estructural de pórticos, se presenta en la siguiente Tabla 9.

Tabla 9: Fuerzas sísmicas equivalentes estructura en sistema estructural de pórticos

| Nivel | Masa x g (kN) | h (m) | $m \cdot h^k$ (kN*m) | C_{vx} | $F_s = C_{vx} \cdot V_s$ (kN) | V_s (kN) |
|----------|---------------|-------|----------------------|----------|-------------------------------|------------|
| Piso 5 | 2,006.97 | 15 | 31,683.24 | 0.34 | 2463.86 | 2463.86 |
| Piso 4 | 2,006.97 | 12 | 25,240.06 | 0.27 | 1962.80 | 4426.66 |
| Piso 3 | 2,006.97 | 9 | 18,827.54 | 0.20 | 1464.13 | 5890.79 |
| Piso 2 | 2,006.97 | 6 | 12,456.00 | 0.13 | 968.65 | 6859.44 |
| Piso 1 | 2,006.97 | 3 | 6,147.05 | 0.07 | 478.03 | 7337.47 |
| Σ | 10,034.83 | 15 | 94,353.89 | 1.00 | 7337.47 | |

(Fuente propia)

Para la verificación de desplazamientos laterales máximos según A.6 – Derivas, de la NSR-10. se analizaron los puntos: 5, 16, 44 y 55; cuya localización se indica en la Figura 15.

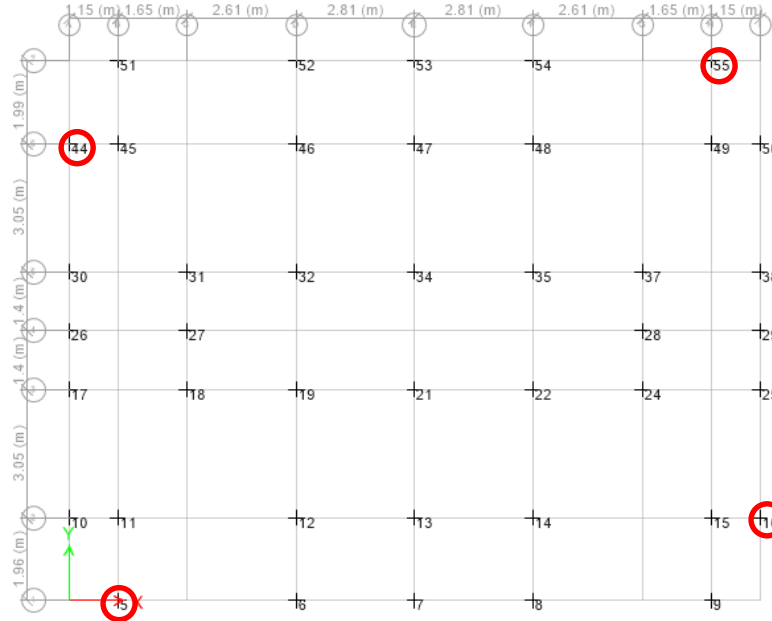


Figura 15: Puntos - Label según modelo matemático edificio en pórticos en concreto.

Los valores obtenidos del modelo matemático, en los puntos antes mencionados, para las derivas máximas y desplazamientos máximos se listan en la Tabla 10. Siendo el %hpi el porcentaje de deriva máximo y %hpc el porcentaje de deriva del punto evaluado.

Tabla 10: Verificación de deriva máxima Edificio en pórticos en concreto

| Verificación de deriva máxima | | | | | |
|-------------------------------|-------|-------|--------------------|----------------|--------------|
| Punto | % hpc | % hpi | Δ_{max} cal | Δ_{max} | Cumplimiento |
| 5 | 0.47% | 1% | 0.014 | 0.030 | Cumple |
| 16 | 0.50% | 1% | 0.015 | 0.030 | Cumple |
| 44 | 0.47% | 1% | 0.014 | 0.030 | Cumple |
| 55 | 0.50% | 1% | 0.015 | 0.030 | Cumple |

(Fuente propia)

5.3.2. Edificación en sistema de muros de carga:

En la Figura 16, se muestra el modelo del edificio en sistema de muros de carga, analizado mediante el programa ETABS V19.0.0 para la evaluación de cargas del edificio.

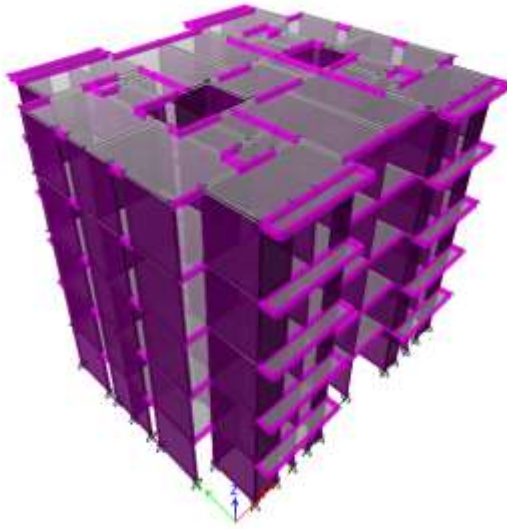


Figura 16: Modelo 3D ETABS V19.0.0 edificio Sistema de muros de carga.

Para la estructura analizada, los valores del periodo fundamental, De acuerdo con la NSR-10. sección A-4 “método de la fuerza horizontal equivalente” son los siguientes:

Periodo Fundamental (A.4.2.2)

| | | |
|----------|--------|---|
| Ct | 0.049 | Tabla A.4.2-1 |
| h | 15 | Altura del edificio |
| α | 0.75 | Tabla A.4.2-1 |
| Ta | 0.37 | Periodo fundamental |
| k | 0.94 | A.4.3.2 |
| Sa | 0.7312 | Aceleración - Periodo fundamental (ETABS V19.0.0) |

El cálculo de las fuerzas sísmicas equivalentes para el edificio con sistema estructural de muros de carga, se presenta en la Tabla 11.

Tabla 11: Fuerzas sísmicas equivalentes estructura en sistema estructural de muros de carga

| Nivel | Masa x g (kN) | h (m) | $m \cdot h^k$ (kN*m) | Cvx | $F_s = C_{vx} \cdot V_s$ (kN) | V_s (kN) |
|----------|---------------|-------|----------------------|------|-------------------------------|------------|
| Piso 5 | 2,088.91 | 15 | 26,400.33 | 0.33 | 2482.47 | 2482.47 |
| Piso 4 | 2,088.91 | 12 | 21,420.52 | 0.26 | 2014.21 | 4496.68 |
| Piso 3 | 2,088.91 | 9 | 16,360.44 | 0.20 | 1538.40 | 6035.09 |
| Piso 2 | 2,088.91 | 6 | 11,190.34 | 0.14 | 1052.25 | 7087.33 |
| Piso 1 | 2,088.91 | 3 | 5,845.98 | 0.07 | 549.71 | 7637.04 |
| Σ | 10,444.53 | 15 | 81,217.60 | 1.00 | 7637.04 | |

(Fuente propia)

Para la verificación de desplazamientos laterales máximos según A.6 – Derivas, de la NSR-10. se analizaron los puntos: 2, 24, 59 y 77; cuya localización se indica en la Figura 17.

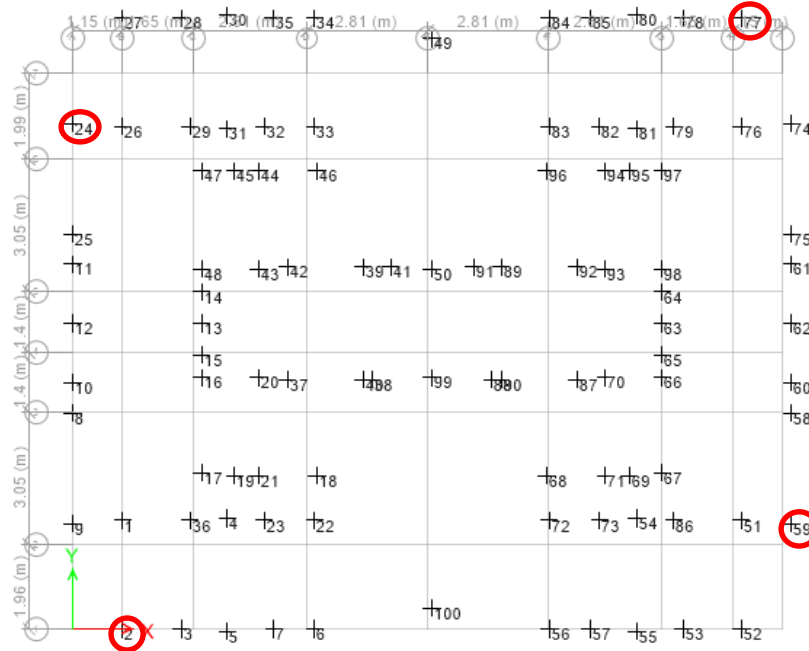


Figura 17: Puntos - Label según modelo matemático edificio muros de carga.

Los valores obtenidos del modelo matemático, en los puntos antes mencionados, para las derivas máximas y desplazamientos máximos se listan en la Tabla 12. Siendo el %hpi el porcentaje de deriva máximo y %hpc el porcentaje de deriva del punto evaluado.

Tabla 12: Verificación de deriva máxima Edificio muros de carga

| Verificación de deriva máxima | | | | | |
|-------------------------------|-------|-------|--------------------|----------------|--------------|
| Punto | % hpc | % hpi | Δ_{max} cal | Δ_{max} | Cumplimiento |
| 2 | 0.17% | 1% | 0.005 | 0.030 | Cumple |
| 24 | 0.17% | 1% | 0.005 | 0.030 | Cumple |
| 59 | 0.17% | 1% | 0.005 | 0.030 | Cumple |
| 77 | 0.17% | 1% | 0.005 | 0.030 | Cumple |

(Fuente propia)

5.3.3. Edificación en sistema de muros en mampostería reforzada:

En la figura 18, se muestra el modelo del edificio en sistema de muros en mampostería reforzada, analizado mediante el programa SAP 2000 para la evaluación de cargas del edificio:

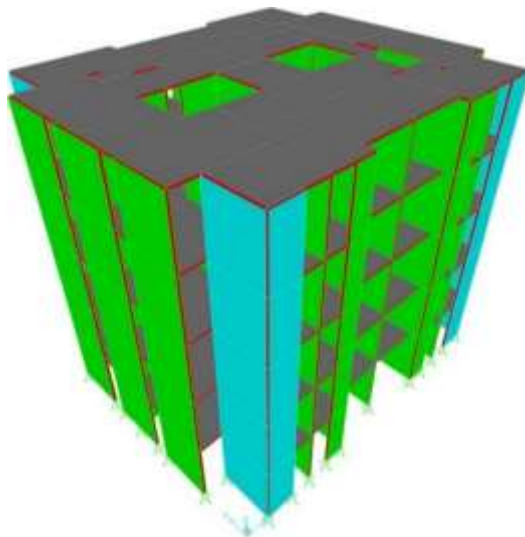


Figura 18: Modelo 3D SAP edificio sistema de muros en mampostería reforzada.

Para la estructura analizada, los valores del periodo fundamental, De acuerdo con la NSR-10. sección A-4 “método de la fuerza horizontal equivalente” son los siguientes:

Periodo Fundamental (A.4.2.2)

| | | |
|----------|---------------|---|
| Ct | <u>0.049</u> | Tabla A.4.2-1 |
| h | <u>15</u> | Altura del edificio |
| α | <u>0.75</u> | Tabla A.4.2-1 |
| Ta | <u>0.37</u> | Periodo fundamental |
| k | <u>0.94</u> | A.4.3.2 |
| Sa | <u>0.7313</u> | Aceleración - Periodo fundamental (SAP2000 V23.1.0) |

El cálculo de las fuerzas sísmicas equivalentes para el edificio con sistema estructural de muros de mampostería reforzada, se listan en la Tabla 13. Siendo el %hpi el porcentaje de deriva máximo y %hpc el porcentaje de deriva punto evaluado.

Tabla 13: Fuerzas sísmicas equivalentes estructura en sistema estructural de muros de mamposteria reforzada

| Nivel | Masa x g (kN) | h (m) | m*h ^k (kN*m) | Cvx | Fs=Cvx*Vs (kN) | Vs (kN) |
|----------|------------------|-------|----------------------------|------|-------------------|---------|
| Piso 5 | 1.843.67 | 15 | 23,300.91 | 0.33 | 2191.33 | 2191.33 |
| Piso 4 | 1.843.67 | 12 | 18,905.73 | 0.26 | 1777.98 | 3969.31 |
| Piso 3 | 1.843.67 | 9 | 14,439.71 | 0.20 | 1357.98 | 5327.29 |
| Piso 2 | 1.843.67 | 6 | 9,876.59 | 0.14 | 928.84 | 6256.13 |
| Piso 1 | 1.843.67 | 3 | 5,159.65 | 0.07 | 485.24 | 6741.37 |
| Σ | 9,218.34 | 15 | 71.682.60 | 1.00 | 6741.37 | |

(Fuente propia)

Para la verificación de desplazamientos laterales máximos según A.6 – Derivas, de la NSR-10. se analizaron los puntos: 2, 14, 22 y 38; cuya localización se indica en la Figura 19.

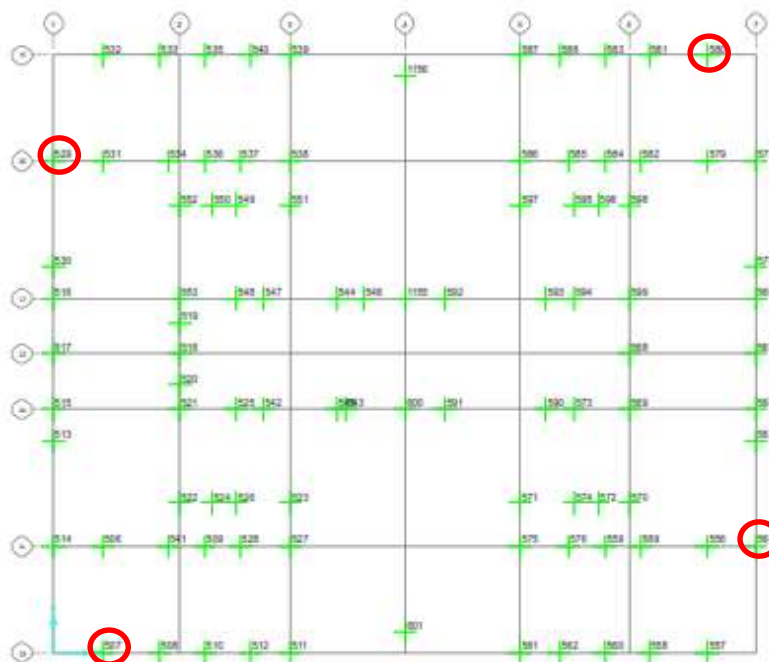


Figura 19: Puntos - Label según modelo matemático edificio muros en mampostería

Los valores obtenidos del modelo matemático, en los puntos antes mencionados, para las derivas máximas y desplazamientos máximos se resumen en la Tabla 14 y la Tabla 15 para las derivas en los ejes X e Y.:

Tabla 14: Análisis de derivas en X estructura en mampostería reforzada

| NIVEL O PISO | NIVEL (m) | ALTURA DE PISO (m) | MODO | DESP. REAL X (cm) | DESP. REAL Y (cm) | DERIVA cm | ADMISIBLE cm | λ | |
|------------------------|-----------|--------------------|------|-------------------|-------------------|-----------|--------------|-----------|----|
| SENTIDO X-X (1) | | | | | | | | | |
| N+9.00 | 3.00 | 3.00 | 4 | 1.513 | 0.098 | 0.377 | 3.000 | 0.126 | OK |
| N+6.00 | 3.00 | 3.00 | 3 | 1.137 | 0.075 | 0.541 | 3.000 | 0.180 | OK |
| N+3.00 | 3.00 | 3.00 | 2 | 0.597 | 0.034 | 0.598 | 3.000 | 0.199 | OK |
| SENTIDO X-X (2) | | | | | | | | | |
| N+9.00 | 3.00 | 3.00 | 24 | 1.580 | 0.136 | 0.392 | 3.000 | 0.131 | OK |
| N+6.00 | 3.00 | 3.00 | 23 | 1.189 | 0.104 | 0.571 | 3.000 | 0.190 | OK |
| N+3.00 | 3.00 | 3.00 | 22 | 0.621 | 0.047 | 0.623 | 3.000 | 0.208 | OK |
| SENTIDO X-X (3) | | | | | | | | | |
| N+9.00 | 3.00 | 3.00 | 16 | 1.513 | -0.132 | 0.378 | 3.000 | 0.126 | OK |
| N+6.00 | 3.00 | 3.00 | 15 | 1.137 | -0.104 | 0.543 | 3.000 | 0.181 | OK |
| N+3.00 | 3.00 | 3.00 | 14 | 0.597 | -0.048 | 0.599 | 3.000 | 0.200 | OK |
| SENTIDO X-X (4) | | | | | | | | | |
| N+9.00 | 3.00 | 3.00 | 40 | 1.580 | -0.132 | 0.392 | 3.000 | 0.131 | OK |
| N+6.00 | 3.00 | 3.00 | 39 | 1.189 | -0.104 | 0.570 | 3.000 | 0.190 | OK |
| N+3.00 | 3.00 | 3.00 | 38 | 0.621 | -0.048 | 0.623 | 3.000 | 0.208 | OK |

(Fuente propia)

Tabla 15: Análisis de derivas en Y estructura en mampostería reforzada

| NIVEL O FISO | NIVEL (m) | ALTURA DE FISO (m) | NODO | DESP. REAL X (cm) | DESP. REAL Y (cm) | DERIVA cm | ADMISIBLE cm | % | |
|------------------------|-----------|--------------------|------|-------------------|-------------------|-----------|--------------|-------|----|
| SENTIDO X-X (1) | | | | | | | | | |
| H=9.00 | 3.00 | 3.00 | 4 | 0.25 | 5.55 | 1.510 | 3.00 | 0.503 | OK |
| H=6.00 | 3.00 | 3.00 | 3 | 0.23 | 4.05 | 2.195 | 3.00 | 0.733 | OK |
| H=3.00 | 3.00 | 3.00 | 2 | 0.13 | 1.85 | 1.885 | 3.00 | 0.628 | OK |
| SENTIDO X-X (2) | | | | | | | | | |
| H=9.00 | 3.00 | 3.00 | 24 | -0.34 | 5.23 | 1.422 | 3.00 | 0.474 | OK |
| H=6.00 | 3.00 | 3.00 | 23 | -0.25 | 3.81 | 2.059 | 3.00 | 0.686 | OK |
| H=3.00 | 3.00 | 3.00 | 22 | -0.09 | 1.76 | 1.760 | 3.00 | 0.587 | OK |
| SENTIDO X-X (3) | | | | | | | | | |
| H=9.00 | 3.00 | 3.00 | 16 | 0.25 | 7.76 | 2.354 | 3.00 | 0.785 | OK |
| H=6.00 | 3.00 | 3.00 | 15 | 0.23 | 5.41 | 2.781 | 3.00 | 0.927 | OK |
| H=3.00 | 3.00 | 3.00 | 14 | 0.13 | 2.63 | 2.632 | 3.00 | 0.877 | OK |
| SENTIDO X-X (4) | | | | | | | | | |
| H=9.00 | 3.00 | 3.00 | 40 | -0.34 | 7.76 | 2.354 | 3.00 | 0.785 | OK |
| H=6.00 | 3.00 | 3.00 | 39 | -0.25 | 5.41 | 2.783 | 3.00 | 0.928 | OK |
| H=3.00 | 3.00 | 3.00 | 38 | -0.09 | 2.63 | 2.631 | 3.00 | 0.877 | OK |

(Fuente propia)

5.3.4. Definición del tipo de cimentación:

Una vez analizados los modelos, se obtuvieron las cargas transmitidas al cimiento, de las cuales, se plantean las soluciones de la cimentación superficial; Se tuvo en cuenta que, se puede cimentar sobre unas zapatas, vigas de cimentación, losas, etc.

Tomando como base, el documento “Estudio de suelos y recomendaciones de cimentación para la construcción edificio en seis pisos y sótano con destino a comercio ubicado en la carrera 13 No 10-83/85/91 sector de San Victorino, Bogotá D.C”, en el cual, se indica que la capacidad admisible es de 82 kN/ m², para condiciones de B~2m. El esfuerzo actuante para cimiento superficial sometido a carga axial, por la metodología rígida, se muestra en la Figura 20.

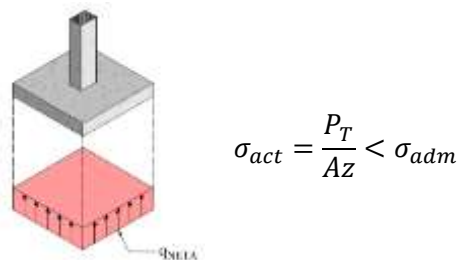


Figura 20: Diagrama de presión del terreno o esfuerzo actuante para cimiento sometido a carga axial

Teniendo en cuenta la carga vertical para cada punto en la base del sistema estructural de pórticos en concreto, la distribución de cargas para cimentación superficial, para el caso más favorable: zapata concéntrica sometida a carga axial únicamente, se lista en la Tabla 16 y se representa en la Figura 21.

Tabla 16: Cálculo preliminar de las dimensiones y área de la cimentación superficial para el edificio con sistema estructural de pórticos en concreto

| Piso | Punto | Combinación | FZ | Az (m²) | B=L (m) |
|-------------|--------------|--------------------|-----------|----------------------------|----------------|
| Base | 5 | 1.0D+1.0L | 257.6685 | 3.14 | 1.77 |
| Base | 6 | 1.0D+1.0L | 344.8264 | 4.21 | 2.05 |
| Base | 7 | 1.0D+1.0L | 224.8037 | 2.74 | 1.66 |
| Base | 8 | 1.0D+1.0L | 343.9145 | 4.19 | 2.05 |
| Base | 9 | 1.0D+1.0L | 257.3338 | 3.14 | 1.77 |
| Base | 10 | 1.0D+1.0L | 117.1910 | 1.43 | 1.20 |
| Base | 11 | 1.0D+1.0L | 260.8439 | 3.18 | 1.78 |
| Base | 12 | 1.0D+1.0L | 395.3997 | 4.82 | 2.20 |
| Base | 13 | 1.0D+1.0L | 328.6326 | 4.01 | 2.00 |
| Base | 14 | 1.0D+1.0L | 400.6165 | 4.89 | 2.21 |
| Base | 15 | 1.0D+1.0L | 261.5238 | 3.19 | 1.79 |
| Base | 16 | 1.0D+1.0L | 116.4420 | 1.42 | 1.19 |
| Base | 17 | 1.0D+1.0L | 189.9010 | 2.32 | 1.52 |
| Base | 18 | 1.0D+1.0L | 179.5888 | 2.19 | 1.48 |
| Base | 19 | 1.0D+1.0L | 281.3862 | 3.43 | 1.85 |
| Base | 21 | 1.0D+1.0L | 399.1457 | 4.87 | 2.21 |
| Base | 22 | 1.0D+1.0L | 356.8131 | 4.35 | 2.09 |
| Base | 24 | 1.0D+1.0L | 190.2171 | 2.32 | 1.52 |
| Base | 25 | 1.0D+1.0L | 188.7489 | 2.30 | 1.52 |
| Base | 26 | 1.0D+1.0L | 506.5446 | 6.18 | 2.49 |
| Base | 27 | 1.0D+1.0L | 294.1526 | 3.59 | 1.89 |
| Base | 28 | 1.0D+1.0L | 307.5115 | 3.75 | 1.94 |
| Base | 29 | 1.0D+1.0L | 508.5961 | 6.20 | 2.49 |
| Base | 30 | 1.0D+1.0L | 189.0007 | 2.30 | 1.52 |
| Base | 31 | 1.0D+1.0L | 179.4750 | 2.19 | 1.48 |
| Base | 32 | 1.0D+1.0L | 281.6878 | 3.44 | 1.85 |
| Base | 34 | 1.0D+1.0L | 399.4441 | 4.87 | 2.21 |
| Base | 35 | 1.0D+1.0L | 357.1211 | 4.36 | 2.09 |
| Base | 37 | 1.0D+1.0L | 190.1111 | 2.32 | 1.52 |
| Base | 38 | 1.0D+1.0L | 187.8513 | 2.29 | 1.51 |
| Base | 44 | 1.0D+1.0L | 117.4236 | 1.43 | 1.20 |
| Base | 45 | 1.0D+1.0L | 262.1906 | 3.20 | 1.79 |

| | | | | | |
|------|----|-----------|----------|-----------------------|------|
| Base | 46 | 1.0D+1.0L | 397.9700 | 4.85 | 2.20 |
| Base | 47 | 1.0D+1.0L | 330.8508 | 4.03 | 2.01 |
| Base | 48 | 1.0D+1.0L | 403.1923 | 4.92 | 2.22 |
| Base | 49 | 1.0D+1.0L | 262.8730 | 3.21 | 1.79 |
| Base | 50 | 1.0D+1.0L | 116.6756 | 1.42 | 1.19 |
| Base | 51 | 1.0D+1.0L | 255.7576 | 3.12 | 1.77 |
| Base | 52 | 1.0D+1.0L | 343.6951 | 4.19 | 2.05 |
| Base | 53 | 1.0D+1.0L | 225.4470 | 2.75 | 1.66 |
| Base | 54 | 1.0D+1.0L | 342.7772 | 4.18 | 2.04 |
| Base | 55 | 1.0D+1.0L | 255.4184 | 3.11 | 1.76 |
| | | | Σ | 144.03 m ² | |

(Fuente propia)

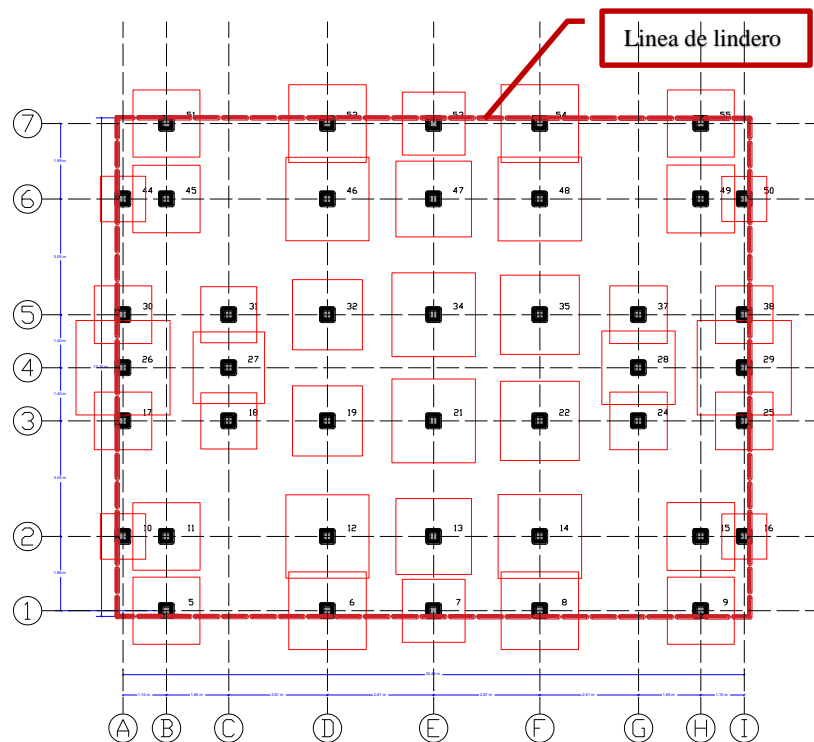


Figura 21: Representación de la distribución de cimiento superficial concéntrico bajo carga axial para edificio en sistema estructural de pórticos en concreto

Dado que la dimensión del edificio es de 13.15m x 16.44m, con un área de 216.19 m², el área de cimiento necesaria (asumiendo cimentación superficial concéntrico, sometido a carga axial únicamente), según la Tabla 16, equivale al 67% del área total. En algunos sectores, los cimientos se superponen unos a otros y además las columnas de borde, dentro del área requerida, se salen del lindero.

Por lo anterior, y teniendo en cuenta que los sistemas estructurales en muros de carga y mampostería reforzada requieren de cimientos corridos; para el caso analizado anteriormente, superando el 50% del área en planta de la estructura, se requiere una losa de cimentación para el par de estructuras tipificadas en los tres sistemas estructurales (pórticos en concreto, muros de carga y mampostería reforzada).

5.3.4.1. Sección transversal de la cimentación:

Para la placa de cimentación se emplea un sistema aligerado, que está compuesto por vigas de cimentación secundarias (viguetas) orientadas en una dirección, apoyadas sobre las vigas de cimentación principales. En la Figura 22 se muestra la sección transversal de la placa de cimentación.

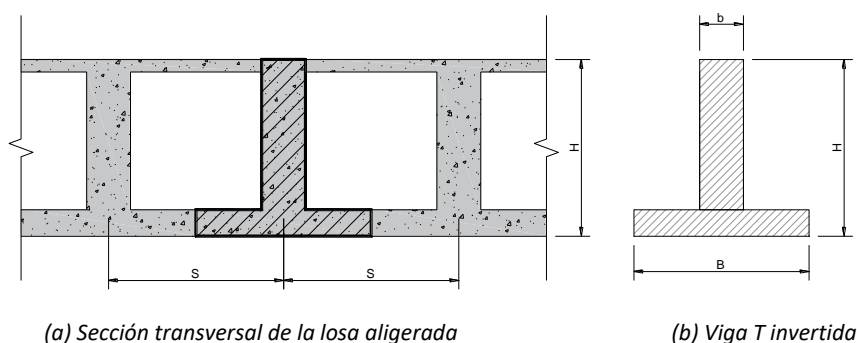


Figura 22: Sección transversal de la placa aligerada de cimentación (sistema viga T invertida)

En la figura 22, se puede notar en la parte izquierda (a) una sección transversal típica de la losa aligerada, en la cual se puede observar una franja, central, que corresponde al sistema tipo T que se forma en los elementos de concreto reforzado correspondiente a las vigas principales y secundarias del sistema y que se muestra en la parte derecha (b), de la misma figura.

5.3.5. Determinación de los parámetros del suelo:

Partiendo de los resultados de la exploración manual de 4 sondeos realizada en la carrera 13 No 10-83/85/91 sector de San Victorino, Bogotá D.C, en el año 2013; de donde se extrajeron muestras alteradas y se hicieron los ensayos físicos y mecánicos tales como límites de Atterberg, humedades, compresiones inconfiadas etc.; se encontraron los siguientes estratos: Baldosa y placa en concreto, hasta profundidades de 0.15, 0.14, 0.10 y 0.12 metros, Relleno en limo arcillosos mezclado con escombros, hasta profundidades de 0.40. 0.50. 0.55 y 0.60 metros : MH, Limo arcilloso orgánico color gris con vetas cafés de alta compresibilidad, hasta profundidades de 1.40. 1.60. 1.80 y 1.70 metros : MH. Arcilla arenosa en matriz gravosa color habano grisácea con vetas amarillas de

oxidación de humedad y plasticidad media alta consistencia media a blanda, hasta profundidades de 5.00. 5.20. 5.30 y 5.28 metros: Arcilla color gris de humedad y plasticidad media alta consistencia media a blanda, hasta profundidades de 15.10. 15.20. 15.12 y 15.60 metros: CH. El nivel freático se localiza entre 2.20m y 2.62m (INGEOLAB, 2013, pág. 16). Además, se complementó las propiedades geotécnicas utilizando los sondeos cerca a la localización del estudio de suelos base, desarrollados para el proyecto “Metro de Bogotá” (BOGOTA, 2016). En la Figura 23 se ilustra la localización de los sondeos.



Figura 23: Ubicación sondeos de referencia para la información geotécnica (Tomado de Google Earth)

Las distancias de los sondeos complementarios con respecto al estudio suelos base “Proyecto”, son: SL2-60-MDB-14 (321m), S2-25-MDB-14 (252.56m), PZSE2-14 (229.3m). Como se ilustra en la Figura 24.

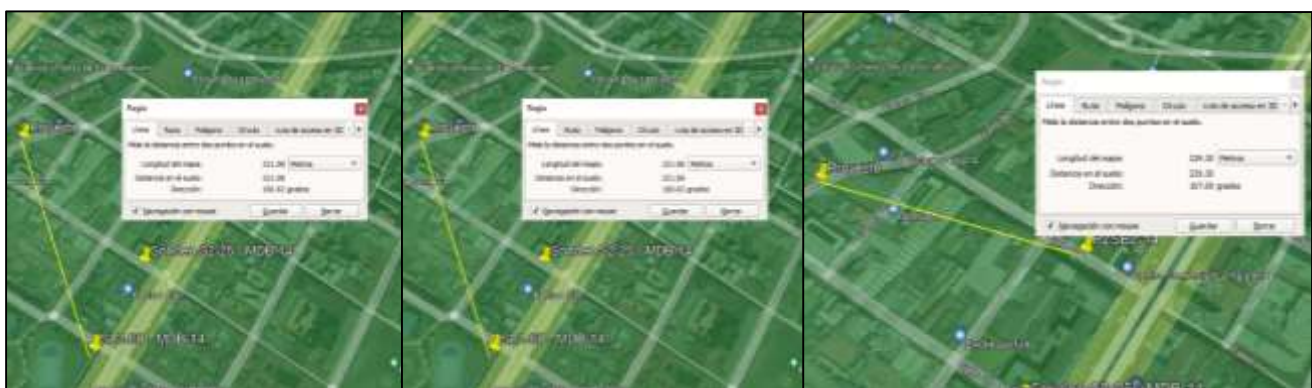


Figura 24: Distancia de los sondeos complementarios con respecto al estudio de suelos base

En la Tabla 17, se presenta el resumen de los parámetros geotécnicos utilizados.

Tabla 17: Parámetros geotécnicos

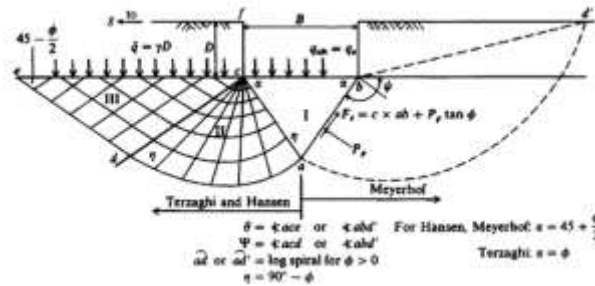
| ID | Prof. Inicial (m) | Prof. Final (m) | Prof. media (m) | Descripción | Ncampo (Golpes/pie) | W _n (%) | LL | LP | IP | Gravas | Arenas | Finos | S _u (kPa) | c' (kPa) | f° | G _s | e ₀ | C _c | Cr | RSC | k (m/s) | λ* | κ* |
|----|-------------------|-----------------|-----------------|---|---------------------|--------------------|---------|---------|---------|--------|--------|-------|----------------------|----------|------|----------------|----------------|----------------|-------|-------|----------|-------|-------|
| 1 | 0.00 | 1.00 | 0.50 | Relleno Antrópico | - | 25 | 60 | 40 | 20 | - | 20 | 80 | 60 | 30 | 25.8 | 2.650 | 0.663 | 0.450 | 0.045 | 5.000 | | 0.118 | 0.012 |
| 2 | 1.00 | 4.00 | 2.50 | Arcilla algo arenosa de alta plasticidad | 7 | 45 | 80 | 30 | 50 | - | 95 | 5 | 60 | 18 | 20.2 | 2.650 | 1.193 | 0.630 | 0.063 | 2.500 | 5.0.E-08 | 0.125 | 0.012 |
| 3 | 4.00 | 7.00 | 5.50 | Limo gris con presencia de arena de grano fino | 3 | 30 | 40 | 20 | 20 | 5 | 55 | 40 | 25 | 30 | 25.8 | 2.650 | 0.795 | 0.270 | 0.027 | 1.800 | 2.0.E-09 | 0.065 | 0.007 |
| 4 | 7.00 | 10.00 | 8.50 | Limo gris con presencia de arena de grano fino | 8 | 40 | 40 | 25 | 15 | - | 45 | 55 | 20 | 30 | 27.5 | 2.650 | 1.060 | 0.270 | 0.027 | 1.500 | 2.0.E-09 | 0.057 | 0.006 |
| 5 | 10.00 | 15.00 | 12.50 | Arcilla arenosa con presencia de materia orgánica | 10 | 60 | 70 | 25 | 45 | - | 5 | 95 | 45 | 21 | 20.9 | 2.650 | 1.590 | 0.540 | 0.054 | 1.900 | 2.0.E-09 | 0.091 | 0.009 |
| 6 | 15.00 | 17.00 | 16.00 | Arena fina con algo de arcilla | 13 | 17 | NL L | NL P | NI P | - | 80 | 20 | - | - | 31 | 2.650 | 0.451 | - | - | - | 1.0.E-04 | - | - |
| 7 | 17.00 | 25.00 | 21.00 | Arena limosa con presencia de gravas subredondeadas | 20 | 19 | NL L | NL P | NI P | 30 | 50 | 20 | - | 7 | 29 | 2.650 | 0.504 | - | - | - | 1.0.E-06 | - | - |

(Fuente: (INGEOLAB, 2013); (BOGOTA, 2016))

Considerando: λ* = Índice de compresión modificado; κ* = Índice de re compresión modificado.

5.3.5.1. Cálculo de la capacidad admisible del suelo:

Con base en el área de cimentación, De acuerdo con la geometría del edificio en planta y bajo los resultados de la Tabla No 17, se calcula la capacidad de carga última y capacidad admisible, según se muestra en la Figura 25, aplicando la metodología de Brinch Hansen (1961).



$$q_{ult} = c N_c s_c d_c i_c b_c g_c + \sigma'_{zD} N_q s_q d_q i_q b_q g_q + 0.5 \gamma' B N_\gamma s_\gamma d_\gamma i_\gamma b_\gamma g_\gamma$$

Figura 25: Metodología de Brinch Hansen (HANSEN, 1961)

Datos de entrada

| | | |
|-------------------------------|----------|--|
| ϕ (°): | 20.79 | Ángulo de fricción interno del suelo |
| Su (kPa) | 28.73 | Cohesión no drenada |
| γ (kN/m ³) | 13.21 | Peso unitario del suelo |
| Bz (m) | 13.15 | Base de la cimentación |
| Lz (m) | 16.44 | Longitud de la cimentación |
| Df (m) | 3.00 | Profundidad de desplante de la cimentación |
| Nf (m) | 2.20 | Nivel freático medido desde la superficie |
| V - H _B (kN) | 12064.10 | Carga axial - Fuerza horizontal |
| Af (m ²) | 195.46 | Area efectiva |

Coeficientes de capacidad de carga

| | |
|----------------|-------|
| N _c | 15.60 |
| N _q | 6.92 |
| N _γ | 3.37 |

Factores de forma

| | |
|----------------|------|
| S _c | 1.35 |
| S _q | 1.28 |
| S _γ | 0.68 |

Factores de profundidad

| | |
|----------------|------|
| d _c | 1.09 |
| d _q | 1.07 |
| d _γ | 1.00 |

Factores de inclinación

| | |
|----------------|------|
| i _c | 0.73 |
| i _q | 0.15 |
| i _γ | 0.02 |

Calculo de la capacidad portante

| | | | | | |
|-----------------------|--------|------|------|-------------------------|--------|
| qu kN/ m ² | 460.10 | F.S. | 3.00 | qadm kN/ m ² | 153.37 |
|-----------------------|--------|------|------|-------------------------|--------|

5.3.5.2. Cálculo del asentamiento:

5.3.5.2.1. Asentamientos inmediatos:

De acuerdo con el informe del estudio de suelos y los parámetros allí indicados, para estimar los valores de asentamientos se utilizó las correlaciones de Terzaghi (1948, 1968), basadas en el resultado de las pruebas de campo y el ancho de cimentación. En la Tabla 18, se detalla la teoría aplicada y los cálculos realizados, teniendo en cuenta Módulo de Young, la Relación de Poisson y la carga admisible calculada anteriormente.

Tabla 18: Cálculo de asentamientos inmediatos teórico

| | | | | |
|---------------------------|-----------------------------|---------------------|------------------|-----------------|
| Modulo de rigidez (G) | 393.62 | kg/c m ² | | |
| Carga admisible (q) | 1.56 | kg/c m ² | | |
| Modulo de Elasticidad (E) | 1738.59 | kg/c m ² | | |
| Coficiente de Poisson (v) | 0.15 | | | |
| Ancho de cimentación | 13.15 | m | | |
| Largo de cimentación | 16.44 | m | | |
| m | | | | |
| lp | 43.50 | | | |
| Factor de seguridad | 1.20 | | | |
| Asentamiento | Asentamiento Carga Flexible | | | |
| Carga rígida (cm) | Esquina (cm) | Centro (cm) | Valor medio (cm) | Carga Total (T) |
| 0.94 | 0.50 | 1.01 | 0.85 | 0.34 |

Carga flexible :

• Esquina :

$$s = q \cdot b \cdot \frac{1 - \nu^2}{E} \cdot I_p$$

• Centro :

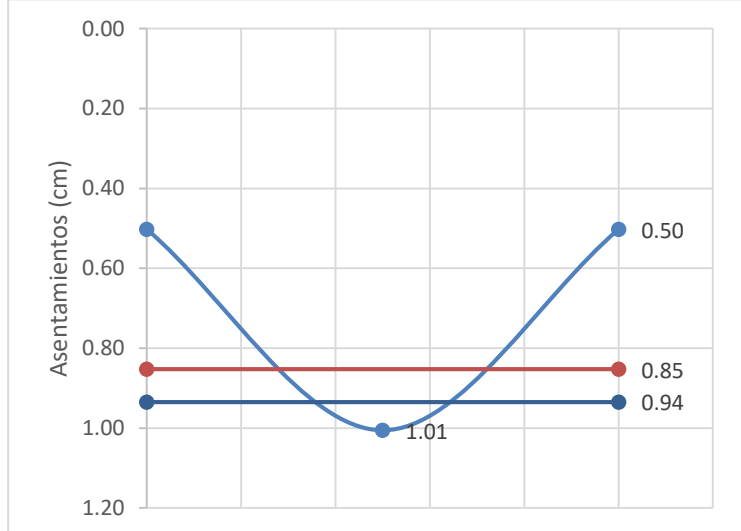
$$s = 2 \cdot q \cdot b \cdot \frac{1 - \nu^2}{E} \cdot I_p$$

• Valor medio :

$$s = s(\text{centro}) \cdot 0.848$$

Carga rígida :

$$s = 93\% \cdot s(\text{valor medio})$$



Fuente: Propia

5.3.5.2.2. Asentamientos por consolidación:

Para la estimación de asentamientos se empleó la teoría de la consolidación, de acuerdo con las propiedades de los ensayos de deformación en los estratos compresibles. Como se muestra en la Tabla 19, teniendo en cuenta que Para arcilla pre consolidada con $\sigma_o < \sigma_p < \Delta\sigma_v$ el asentamiento es:

$$S_c = C_r \frac{H_o}{1 + e_o} \log\left(\frac{\sigma_p}{\sigma_o}\right) + C_c \frac{H_o}{1 + e_o} \log\left(\frac{\sigma_o + \Delta\sigma_v}{\sigma_p}\right) \quad \text{Ecuación 7: Asentamientos por consolidación}$$

Tabla 19: Asentamiento por consolidación primaria

| | |
|------------------------|---------------------------------|
| Area efectiva (Af) | <u>195.46</u> m ² |
| Prof de desplante (Df) | <u>3.00</u> m |
| Carga / área (q) | <u>61.72</u> kN/ m ² |

| Capa | Prof | Espesor | Prof al centro | γ' | σ'_o | OCR | σ'_p | Cc | Cr | eo | $\Delta\sigma_v$ (m) | Sc |
|--------------------------------|-------|----------------|----------------|-------------------|-----------------------|------|-----------------------|------|-------|--------|-----------------------|-------|
| | (m) | Δz (m) | z (m) | kN/m ³ | (kN/ m ²) | | (kN/ m ²) | | | | (kN/ m ²) | (m) |
| | 1.00 | 2.2 | Nf (m) | | | | | | | | | |
| 2 | | 3.00 | 2.50 | 13.21 | 30.09 | 2.50 | 75.23 | 0.63 | 0.063 | 1.1925 | 44.381 | 0.031 |
| | 4.00 | | | | | | | | | | | |
| 3 | | 3.00 | 5.50 | 13.23 | 40.41 | 1.80 | 72.74 | 0.27 | 0.027 | 0.795 | 31.749 | 0.010 |
| | 7.00 | | | | | | | | | | | |
| 4 | | 3.00 | 8.50 | 13.24 | 50.77 | 1.50 | 76.15 | 0.27 | 0.027 | 1.06 | 23.836 | 0.003 |
| | 10.00 | | | | | | | | | | | |
| Asentamiento por consolidación | | | | | | | | | | | Σ | 0.044 |

Los asentamientos por consolidación son de 4.4cm y los asentamientos inmediatos son de 1cm; teniendo en cuenta lo anterior, los asentamientos totales son de 5.4cm.

5.3.6. Cimentación superficial:

Una vez definido el tipo de cimentación superficial, la capacidad admisible y asentamientos, teniendo en cuenta que se trata de una losa de cimentación para todos los casos, por simetría, el centro de masa de la placa de cimentación, está localizado en el centro geométrico de la placa, siendo:

| | | |
|-----------|--------------|---|
| B (m) | 16.44 | Lado corto de la placa de cimentación (distancia eje a eje) |
| L (m) | 13.15 | Lado largo de la placa de cimentación (distancia eje a eje) |
| C.M.X (m) | 8.22 | Centro de masa en X |
| C.M.Y (m) | 6.58 | Centro de masa en Y |

Para tener una distribución adecuada de presiones y mantener las condiciones de deformación asumidas, es necesario eliminar las excentricidades, producidas por la diferencia que pueda existir entre el centro de cargas y centro geométrico de la losa; por ello, para cada par de edificaciones, De acuerdo con el sistema estructural empleado, se ha llevado a cabo los cálculos necesarios.

5.3.6.1. Cimentación del edificio en sistema de pórticos en concreto:

La Tabla 20 muestra la carga que baja por cada columna, necesaria para calcular el centro de cargas de la placa de cimentación:

Tabla 20: Cálculo del centro de cargas de la cimentación para la edificación con sistema estructural de pórticos en concreto

| BASE | P TOTAL | COORDENADAS | | MX | MY |
|------|---------|---------------------|---------------------|----------|----------|
| | kN | Coordenada X (m) | Coordenada Y (m) | kN*m | kN*m |
| 5 | 257.67 | 1.15 | 0.00 | 296.32 | 0.00 |
| 6 | 344.83 | 5.41 | 0.00 | 1.865.53 | 0.00 |
| 7 | 224.8 | 8.22 | 0.00 | 1.847.86 | 0.00 |
| 8 | 343.91 | 11.03 | 0.00 | 3,793.33 | 0.00 |
| 9 | 257.33 | 15.29 | 0.00 | 3,934.58 | 0.00 |
| 10 | 117.19 | 0.00 | 1.96 | 0.00 | 229.69 |
| 11 | 260.84 | 1.15 | 1.96 | 299.97 | 511.25 |
| 12 | 395.4 | 5.41 | 1.96 | 2,139.11 | 774.98 |
| 13 | 328.63 | 8.22 | 1.96 | 2,701.34 | 644.11 |
| 14 | 400.62 | 11.03 | 1.96 | 4,418.84 | 785.22 |
| 15 | 261.52 | 15.29 | 1.96 | 3,998.64 | 512.58 |
| 16 | 116.44 | 16.44 | 1.96 | 1,914.27 | 228.22 |
| 17 | 189.9 | 0.00 | 5.01 | 0.00 | 951.40 |
| 18 | 179.59 | 2.80 | 5.01 | 502.85 | 899.75 |
| 19 | 281.39 | 5.41 | 5.01 | 1,522.32 | 1,409.76 |
| 21 | 399.15 | 8.22 | 5.01 | 3,281.01 | 1,999.74 |
| 22 | 356.81 | 11.03 | 5.01 | 3,935.61 | 1,787.62 |
| 24 | 190.22 | 13.64 | 5.01 | 2,594.60 | 953.00 |
| 25 | 188.75 | 16.44 | 5.01 | 3,103.05 | 945.64 |
| 26 | 506.54 | 0.00 | 6.41 | 0.00 | 3,246.92 |
| 27 | 294.15 | 2.80 | 6.41 | 823.62 | 1,885.50 |
| 28 | 307.51 | 13.64 | 6.41 | 4,194.44 | 1,971.14 |
| 29 | 508.6 | 16.44 | 6.41 | 8,361.38 | 3,260.13 |
| 30 | 189 | 0.00 | 7.81 | 0.00 | 1,476.09 |

| | | | | | |
|----------|------------------|-------|-------|------------------|------------------|
| 31 | 179.48 | 2.80 | 7.81 | 502.54 | 1.401.74 |
| 32 | 281.69 | 5.41 | 7.81 | 1,523.94 | 2,200.00 |
| 34 | 399.44 | 8.22 | 7.81 | 3,283.40 | 3,119.63 |
| 35 | 357.12 | 11.03 | 7.81 | 3,939.03 | 2,789.11 |
| 37 | 190.11 | 13.64 | 7.81 | 2,593.10 | 1,484.76 |
| 38 | 187.85 | 16.44 | 7.81 | 3,088.25 | 1,467.11 |
| 44 | 117.42 | 0.00 | 10.86 | 0.00 | 1,275.18 |
| 45 | 262.19 | 1.15 | 10.86 | 301.52 | 2,847.38 |
| 46 | 397.97 | 5.41 | 10.86 | 2,153.02 | 4,321.95 |
| 47 | 330.85 | 8.22 | 10.86 | 2,719.59 | 3,593.03 |
| 48 | 403.19 | 11.03 | 10.86 | 4,447.19 | 4,378.64 |
| 49 | 262.87 | 15.29 | 10.86 | 4,019.28 | 2,854.77 |
| 50 | 116.68 | 16.44 | 10.86 | 1,918.22 | 1,267.14 |
| 51 | 255.76 | 1.15 | 12.85 | 294.12 | 3,286.52 |
| 52 | 343.7 | 5.41 | 12.85 | 1,859.42 | 4,416.55 |
| 53 | 225.45 | 8.22 | 12.85 | 1,853.20 | 2,897.03 |
| 54 | 342.78 | 11.03 | 12.85 | 3,780.86 | 4,404.72 |
| 55 | 255.42 | 15.29 | 12.85 | 3,905.37 | 3,282.15 |
| Σ | 11.810.76 | | | 97,710.73 | 75,760.15 |

(Fuente propia)

La Tabla 21 muestra las coordenadas del centro de masa y el centro de cargas de la placa de cimentación.

Tabla 21: Centro de masa y centro de carga de la placa de cimentación para el sistema de pórticos en concreto

| Punto | Coord. X (m) | Coord. Y (m) |
|--------------|---------------------|---------------------|
| C. de masa | 8.22 | 6.58 |
| C. de cargas | 8.27 | 6.41 |

(Fuente propia)

La Figura 26 muestra de manera esquemática la localización del centro de masa y el centro de cargas de la placa de cimentación.

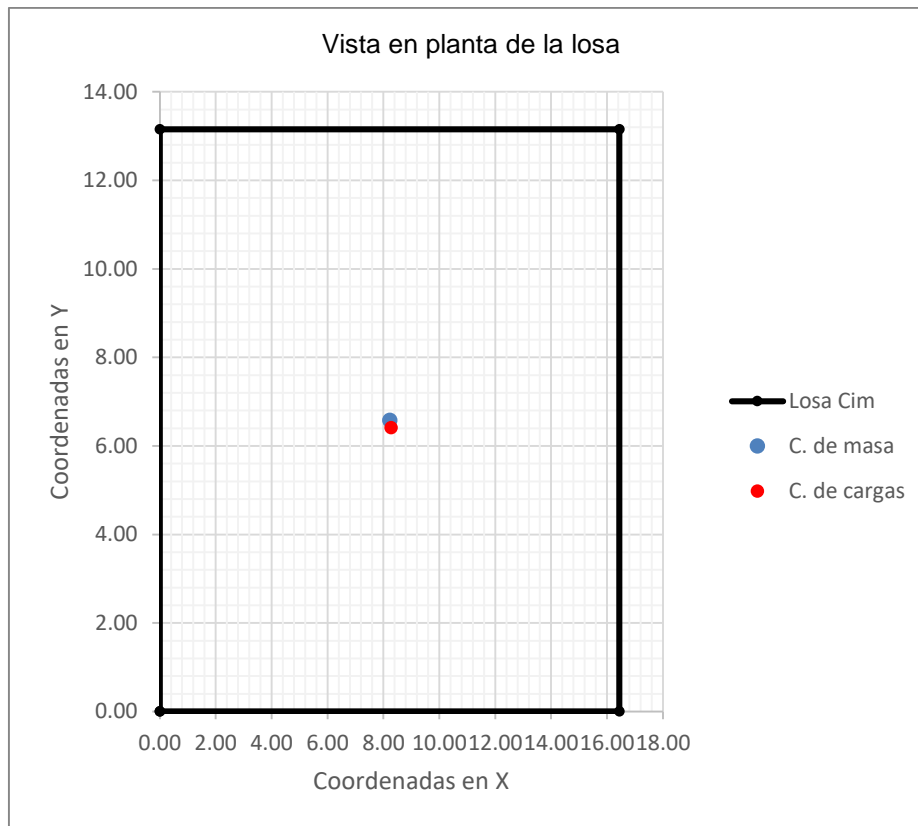


Figura 26: Localización del centro de masa y el centro de cargas de la placa de cimentación para el sistema de pórticos en concreto

La distancia entre ambos puntos, medida en ambas direcciones, es igual a la excentricidad; las excentricidades, calculadas para cada dirección, son las siguientes:

- ex 0.05 m Excentricidad en X
- ey 0.16 m Excentricidad en Y

De acuerdo con los resultados obtenidos se obtiene que hay excentricidad en ambas direcciones, lo cual, se basa que en la cimentación el centro de cargas sea igual al centro de masa, esto con el propósito de considerar una presión uniforme sobre el terreno.

Es necesario entonces determinar la altura de la placa de cimentación para el cumplimiento de excentricidad igual a cero; El espesor de la placa de cimentación se ha calculado mediante un proceso iterativo, empleando la ecuación de Winkler, la cual se muestra a continuación:

$$\beta = \frac{K_s}{\sqrt[4]{\frac{4E_c I}{B}}}$$

El parámetro de rigidez del sistema tipo viga T invertida se ha evaluado multiplicando la ecuación anterior por el valor de la mayor longitud entre ejes de columnas para las vigas. La siguiente relación muestra la variación entre la rigidez necesaria para lograr un cimiento rígido y un cimiento flexible, se considera una relación de rigidez adecuada al valor medio de estos dos intervalos:

$$\beta L \left\{ \begin{array}{l} \text{Si } \beta L = \frac{\pi}{4} \rightarrow \text{Cimiento rígido} \\ \text{Si } \beta L = \frac{\pi}{2} \rightarrow \text{Cimiento flexible} \end{array} \right\}$$

El segundo momento de área o momento de inercia de la sección compuesta (viga T invertida), se ha calculado según el teorema de Steiner o teorema de los ejes paralelos. La Tabla 22 resume los cálculos realizados.

Tabla 22: Momento de inercia de la sección compuesta (viga T invertida) para el sistema de pórticos en concreto

| Sección | B (m) | H (m) | yi (m) | Ai (m ²) | Ai * yi (m ³) | di (m) | Io (m ⁴) | Ai*di ² |
|---------|-------|-------|--------|-----------------------|---------------------------|--------|----------------------|--------------------|
| Patín | 1.00 | 0.20 | 0.100 | 0.20 | 0.020 | 0.188 | 0.0007 | 0.007 |
| Alma | 0.25 | 0.64 | 0.520 | 0.16 | 0.083 | 0.234 | 0.0055 | 0.009 |
| Σ | | | | 0.36 | 0.103 | | 0.006 | 0.016 |

(Fuente propia)

El centro de gravedad de la sección, medido desde la fibra inferior del cimiento es:

$$y_b = 28.67 \text{ cm}$$

El segundo momento de área de la sección transversal, es:

$$I_{viga T} = 0.022 \text{ m}^4$$

El valor de la inercia fue empleado en la ecuación del parámetro de rigidez del cimiento, considerando un valor intermedio, el cual corresponde a:

$$\beta L = 0.84m$$

La geometría de cada uno de los elementos que componen la placa de cimentación, se describe en la Tabla 23.

Tabla 23: Datos de la geometría de la placa de cimentación para el sistema de pórticos en concreto

| | | |
|-------|------|-------------------------|
| e (m) | 0.07 | Espesor loseta superior |
|-------|------|-------------------------|

| | | |
|--------|------|-------------------------|
| t (m) | 0.20 | Espesor loseta inferior |
| e (m) | 0.25 | Ancho de las viguetas |
| h (m) | 0.84 | Altura de las viguetas |
| hl (m) | 0.64 | Alma viga |
| s (m) | 1.00 | Separación de viguetas |
| hl (m) | 0.57 | Altura libre |

(Fuente propia)

Una vez determinada la geometría de la losa, se procede a la evaluación de cargas de la misma y con esto, se podrá finalmente calcular el peso actuante en la edificación. Vale la pena resaltar que, aunque no se haya realizado un análisis detallado de las vigas aéreas, por simplicidad, se ha supuesto que el considerar el peso de la losa uniforme en toda el área de los entrepisos, es equivalente a considerar el peso de las vigas; El peso por m² de la placa de cimentación, se muestra en la Tabla 24.

Tabla 24: Pesos de la placa de cimentación.

| Descripcion | peso |
|--------------------|-------------------------|
| Loseta superior | 1.68 kN/m ² |
| Loseta inferior | 4.80 kN/m ² |
| Caseton de guadua | 0.35 kN/m ² |
| Viguetas | 3.84 kN/m ² |
| Pisos y acabados | 1.20 kN/m ² |
| Cielo raso | 0.00 kN/m ² |
| Total carga muerta | 11.87 kN/m ² |

(Fuente propia)

Para anular la excentricidad, se plantea adicionar una carga y un momento necesario para tener la carga centrada. Como el centro de cargas está desplazado hacia la derecha-inferior con respecto al centro geométrico de la losa, debe aumentarse el peso del edificio hacia la izquierda-superior. Se emplea la siguiente expresión:

$$\frac{\sum P_i \cdot d_i + P_a \cdot d_a}{\sum P_i + P_a} = CM$$

En donde:

- $\sum P_i \cdot d_i$ Sumatoria del producto de las cargas verticales por su respectivo brazo de palanca
- P_a Carga adicional necesaria para centrar las cargas
- d_a Distancia al punto de aplicación de la carga adicional
- CM Centro de masa

Resolviendo la ecuación anterior, para un peso unitario del concreto ciclópeo igual, $\gamma = 22 \text{ kN/m}^3$, el volumen de concreto será igual a:

$$V_{xy} = 15.40 \text{ m}^3$$

5.3.6.2. Cimentación del edificio en sistema muros de carga:

La Tabla 25 muestra la carga vertical en cada punto, necesaria para calcular el centro de cargas de la placa de cimentación.

Tabla 25: Cálculo del centro de cargas de la cimentación para la edificación con sistema estructural de muros de carga

| BASE | P TOTAL | COORDENADAS | | MX | MY |
|------|----------|------------------|------------------|----------|----------|
| | kN | Coordenada X (m) | Coordenada Y (m) | kN*m | kN*m |
| 1 | 184.3903 | 1.16 | 2.51 | 213.89 | 462.82 |
| 2 | 182.3392 | 1.16 | 0.00 | 211.51 | 0.00 |
| 3 | 60.601 | 2.51 | 0.00 | 152.11 | 0.00 |
| 4 | 119.8483 | 3.58 | 2.56 | 429.06 | 306.81 |
| 5 | 125.7223 | 3.58 | -0.06 | 450.09 | -7.54 |
| 6 | 178.4653 | 5.60 | 0.00 | 999.41 | 0.00 |
| 7 | 48.7399 | 4.66 | 0.00 | 226.93 | 0.00 |
| 8 | 103.3631 | 0.00 | 5.00 | 0.00 | 516.82 |
| 9 | 107.4698 | 0.00 | 2.44 | 0.00 | 262.23 |
| 10 | 116.3426 | 0.00 | 5.70 | 0.00 | 663.15 |
| 11 | 116.7529 | 0.00 | 8.44 | 0.00 | 985.39 |
| 12 | 132.9744 | 0.00 | 7.07 | 0.00 | 940.13 |
| 13 | 127.4549 | 2.99 | 7.07 | 381.09 | 901.11 |
| 14 | 65.1351 | 2.99 | 7.80 | 194.75 | 508.05 |
| 15 | 64.9073 | 2.99 | 6.34 | 194.07 | 411.51 |
| 16 | 113.5732 | 2.99 | 5.82 | 339.58 | 661.00 |
| 17 | 121.8009 | 2.99 | 3.61 | 364.18 | 439.70 |
| 18 | 88.1107 | 5.66 | 3.54 | 498.71 | 311.91 |
| 19 | 97.9711 | 3.75 | 3.54 | 367.39 | 346.82 |
| 20 | 105.317 | 4.31 | 5.82 | 453.92 | 612.94 |
| 21 | 108.0875 | 4.31 | 3.54 | 465.86 | 382.63 |
| 22 | 182.7366 | 5.60 | 2.51 | 1.023.32 | 458.67 |
| 23 | 57.373 | 4.44 | 2.51 | 254.74 | 144.01 |
| 24 | 108.3823 | 0.00 | 11.70 | 0.00 | 1.268.07 |
| 25 | 103.4908 | 0.00 | 9.14 | 0.00 | 945.91 |
| 26 | 183.8105 | 1.16 | 11.63 | 213.22 | 2,137.72 |

| | | | | | |
|----|----------|-------|-------|----------|----------|
| 27 | 183.547 | 1.16 | 14.14 | 212.91 | 2,595.35 |
| 28 | 61.2051 | 2.51 | 14.14 | 153.62 | 865.44 |
| 29 | 67.7232 | 2.72 | 11.63 | 184.21 | 787.62 |
| 30 | 126.4921 | 3.58 | 14.20 | 452.84 | 1,796.19 |
| 31 | 119.849 | 3.58 | 11.58 | 429.06 | 1,387.85 |
| 32 | 57.2904 | 4.44 | 11.63 | 254.37 | 666.29 |
| 33 | 182.6071 | 5.60 | 11.63 | 1,022.60 | 2,123.72 |
| 34 | 179.8479 | 5.60 | 14.14 | 1,007.15 | 2,543.05 |
| 35 | 49.4758 | 4.65 | 14.14 | 230.06 | 699.59 |
| 36 | 68.2989 | 2.72 | 2.51 | 185.77 | 171.43 |
| 37 | 86.1917 | 4.97 | 5.76 | 428.37 | 496.46 |
| 38 | 83.9339 | 6.93 | 5.76 | 581.66 | 483.46 |
| 39 | 113.8857 | 6.72 | 8.38 | 765.31 | 954.36 |
| 40 | 113.6878 | 6.72 | 5.76 | 763.98 | 654.84 |
| 41 | 102.8645 | 7.36 | 8.38 | 757.08 | 862.00 |
| 42 | 105.8769 | 4.97 | 8.38 | 526.21 | 887.25 |
| 43 | 105.8524 | 4.31 | 8.32 | 456.22 | 880.69 |
| 44 | 109.1547 | 4.31 | 10.60 | 470.46 | 1,157.04 |
| 45 | 99.3741 | 3.75 | 10.60 | 372.65 | 1,053.37 |
| 46 | 89.2699 | 5.66 | 10.60 | 505.27 | 946.26 |
| 47 | 122.7318 | 2.99 | 10.60 | 366.97 | 1,300.96 |
| 48 | 116.9364 | 2.99 | 8.32 | 349.64 | 972.91 |
| 49 | 314.2845 | 8.32 | 13.66 | 2,614.85 | 4,293.13 |
| 50 | 302.3438 | 8.32 | 8.32 | 2,515.50 | 2,515.50 |
| 51 | 184.6755 | 15.48 | 2.51 | 2,858.78 | 463.54 |
| 52 | 182.6089 | 15.48 | 0.00 | 2,826.79 | 0.00 |
| 53 | 60.4813 | 14.13 | 0.00 | 854.60 | 0.00 |
| 54 | 119.9501 | 13.06 | 2.56 | 1,566.55 | 307.07 |
| 55 | 125.6912 | 13.06 | -0.06 | 1,641.53 | -7.54 |
| 56 | 178.4122 | 11.04 | 0.00 | 1,969.67 | 0.00 |
| 57 | 48.824 | 11.98 | 0.00 | 585.11 | 0.00 |
| 58 | 103.6048 | 16.64 | 5.00 | 1,723.98 | 518.02 |
| 59 | 107.7733 | 16.64 | 2.44 | 1,793.35 | 262.97 |
| 60 | 117.6062 | 16.64 | 5.70 | 1,956.97 | 670.36 |
| 61 | 115.2584 | 16.64 | 8.44 | 1,917.90 | 972.78 |
| 62 | 133.1119 | 16.64 | 7.07 | 2,214.98 | 941.10 |
| 63 | 126.7369 | 13.65 | 7.07 | 1,729.96 | 896.03 |
| 64 | 64.7733 | 13.65 | 7.80 | 884.16 | 505.23 |
| 65 | 64.6252 | 13.65 | 6.34 | 882.13 | 409.72 |
| 66 | 113.4538 | 13.65 | 5.82 | 1,548.64 | 660.30 |

| | | | | | |
|-----------|------------------|-------|-------|-------------------|------------------|
| 67 | 121.6182 | 13.65 | 3.61 | 1.660.10 | 439.04 |
| 68 | 88.9065 | 10.98 | 3.54 | 976.19 | 314.73 |
| 69 | 98.9594 | 12.89 | 3.54 | 1.275.59 | 350.32 |
| 70 | 106.9887 | 12.33 | 5.82 | 1.319.17 | 622.67 |
| 71 | 109.7663 | 12.33 | 3.54 | 1.353.42 | 388.57 |
| 72 | 183.0035 | 11.04 | 2.51 | 2,020.36 | 459.34 |
| 73 | 57.6876 | 12.20 | 2.51 | 703.79 | 144.80 |
| 74 | 108.925 | 16.64 | 11.70 | 1.812.51 | 1,274.42 |
| 75 | 103.7562 | 16.64 | 9.14 | 1.726.50 | 948.33 |
| 76 | 184.0523 | 15.48 | 11.63 | 2,849.13 | 2,140.53 |
| 77 | 183.7258 | 15.48 | 14.14 | 2,844.08 | 2,597.88 |
| 78 | 61.1353 | 14.13 | 14.14 | 863.84 | 864.45 |
| 79 | 67.6154 | 13.92 | 11.63 | 941.21 | 786.37 |
| 80 | 126.3592 | 13.06 | 14.20 | 1.650.25 | 1.794.30 |
| 81 | 119.9123 | 13.06 | 11.58 | 1.566.05 | 1.388.58 |
| 82 | 57.5165 | 12.20 | 11.63 | 701.70 | 668.92 |
| 83 | 182.6398 | 11.04 | 11.63 | 2,016.34 | 2,124.10 |
| 84 | 179.531 | 11.04 | 14.14 | 1.982.02 | 2,538.57 |
| 85 | 49.6175 | 11.99 | 14.14 | 594.91 | 701.59 |
| 86 | 68.0932 | 13.92 | 2.51 | 947.86 | 170.91 |
| 87 | 97.8561 | 11.67 | 5.76 | 1.141.98 | 563.65 |
| 88 | 95.454 | 9.71 | 5.76 | 926.86 | 549.82 |
| 89 | 129.178 | 9.92 | 8.38 | 1.281.45 | 1.082.51 |
| 90 | 128.8117 | 9.92 | 5.76 | 1.277.81 | 741.96 |
| 91 | 116.3598 | 9.28 | 8.38 | 1.079.82 | 975.10 |
| 92 | 119.3933 | 11.67 | 8.38 | 1.393.32 | 1.000.52 |
| 93 | 107.2594 | 12.33 | 8.32 | 1.322.52 | 892.40 |
| 94 | 110.5708 | 12.33 | 10.60 | 1.363.35 | 1.172.05 |
| 95 | 99.8116 | 12.89 | 10.60 | 1.286.57 | 1.058.00 |
| 96 | 89.8486 | 10.98 | 10.60 | 986.54 | 952.40 |
| 97 | 122.4573 | 13.65 | 10.60 | 1.671.54 | 1.298.05 |
| 98 | 116.7285 | 13.65 | 8.32 | 1.593.34 | 971.18 |
| 99 | 323.1945 | 8.32 | 5.82 | 2,688.98 | 1.880.99 |
| 100 | 331.8913 | 8.32 | 0.48 | 2,761.34 | 159.31 |
| Σ | 12,064.10 | | | 100,576.14 | 85,370.54 |

(Fuente propia)

La Tabla 26 muestra las coordenadas del centro de masa y el centro de cargas de la placa de cimentación.

Tabla 26: Centro de masa y centro de carga de la placa de cimentación para el sistema estructural de muros de carga

| Punto | Coord. X (m) | Coord. Y (m) |
|--------------|--------------|--------------|
| C. de masa | 8.22 | 6.43 |
| C. de cargas | 8.34 | 7.08 |

(Fuente propia)

La Figura 26 muestra de manera esquemática la localización del centro de masa y el centro de cargas de la placa de cimentación.

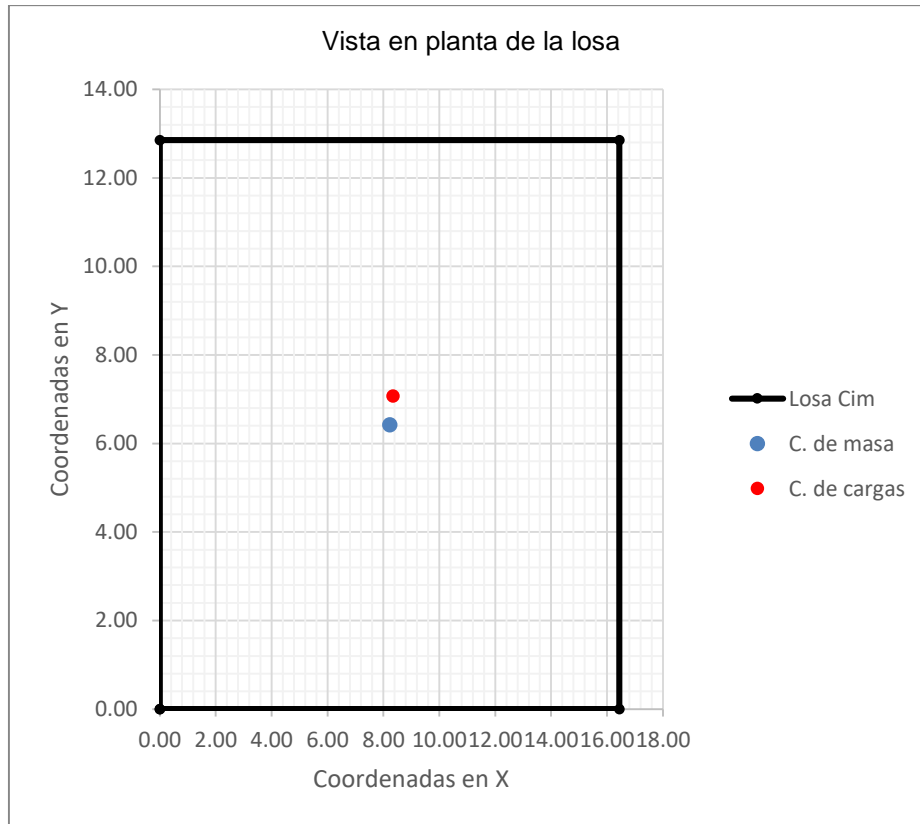


Figura 27: Localización del centro de masa y el centro de cargas de la placa de cimentación para el sistema estructural de muros de carga

La distancia entre ambos puntos, medida en ambas direcciones, es igual a la excentricidad; las excentricidades, calculadas para cada dirección, son las siguientes:

ex 0.12 m Excentricidad en X
 ey -0.65 m Excentricidad en Y

De acuerdo con los resultados obtenidos se puede observar que hay excentricidad en ambas direcciones. Sin embargo, se busca que en la cimentación el centro de cargas sea igual al centro de masa, esto con el propósito de considerar una presión uniforme sobre el terreno.

Es necesario entonces determinar la altura de la placa de cimentación para posterior, hacer la corrección para el cumplimiento de excentricidad igual a cero. El espesor de la placa de cimentación se ha evaluado mediante un proceso iterativo, empleando la ecuación de Winkler, la cual se muestra a continuación:

$$\beta = \frac{K_s}{\sqrt[4]{\frac{4E_c I}{B}}}$$

El parámetro de rigidez del sistema tipo viga T invertida se ha calculado multiplicando la ecuación anterior por el valor de la mayor longitud entre ejes de columnas para las vigas. La siguiente relación muestra la variación entre la rigidez necesaria para lograr un cimiento rígido y un cimiento flexible, se considera una relación de rigidez adecuada al valor medio de estos dos intervalos:

$$\beta L \begin{cases} \text{Si } \beta L = \frac{\pi}{4} \rightarrow \text{Cimiento rígido} \\ \text{Si } \beta L = \frac{\pi}{2} \rightarrow \text{Cimiento flexible} \end{cases}$$

El segundo momento de área o momento de inercia de la sección compuesta (viga T invertida), se ha calculado según el teorema de Steiner o teorema de los ejes paralelos. La Tabla 27 resume los cálculos realizados.

Tabla 27: Momento de inercia de la sección compuesta (viga T invertida) para el sistema de muros de carga

| Sección | B (m) | H (m) | yi (m) | Ai (m ²) | Ai * yi (m3) | di (m) | Io (m4) | Ai*di ² |
|---------|-------|-------|--------|-----------------------|--------------|--------|---------|--------------------|
| Patín | 1.00 | 0.20 | 0.100 | 0.20 | 0.020 | 0.194 | 0.0007 | 0.008 |
| Alma | 0.25 | 0.66 | 0.530 | 0.17 | 0.087 | 0.236 | 0.0060 | 0.009 |
| Σ | | | | 0.37 | 0.107 | | 0.007 | 0.017 |

(Fuente propia)

El centro de gravedad de la sección, medido desde la fibra inferior del cimiento es:

$$y_b = 28.80\text{cm}$$

El segundo momento de área de la sección transversal, es:

$$I_{viga T} = 0.022 \text{ m}^4$$

La magnitud de la inercia fue empleada en la ecuación del parámetro de rigidez del cimiento, considerando un valor intermedio, el cual corresponde a:

$$\beta L = 0.84m$$

La geometría de cada uno de los elementos que componen la placa de cimentación, se resume en la Tabla 28.

Tabla 28: Datos de la geometría de la placa de cimentación para el sistema de muros de carga

| | | |
|--------|------|-------------------------|
| e (m) | 0.07 | Espesor loseta superior |
| t (m) | 0.20 | Espesor loseta inferior |
| e (m) | 0.25 | Ancho de las viguetas |
| h (m) | 0.84 | Altura de las viguetas |
| hl (m) | 0.64 | Alma viga |
| s (m) | 1.00 | Separación de viguetas |
| hl (m) | 0.57 | Altura libre |

(Fuente propia)

Una vez determinada la geometría de la losa, se procede a la evaluación de cargas de la misma y con esto, se podrá finalmente calcular el peso actuante en la edificación. Vale la pena resaltar que, aunque no se haya realizado un análisis detallado de las vigas aéreas, por simplicidad, se ha supuesto que el considerar el peso de la losa uniforme en toda el área de los entresijos, es equivalente a tener en cuenta el peso de las vigas; El peso por m², por el peso propio de la placa de cimentación, se muestra Tabla 29.

Tabla 29: Pesos de la placa de cimentación

| Descripcion | peso |
|--------------------|-------------------------|
| Loseta superior | 1.68 kN/m ² |
| Loseta inferior | 4.80 kN/m ² |
| Caseton de guadua | 0.35 kN/m ² |
| Viguetas | 3.84 kN/m ² |
| Pisos y acabados | 1.20 kN/m ² |
| Cielo raso | 0.00 kN/m ² |
| Total carga muerta | 11.87 kN/m ² |

(Fuente propia)

Para anular la excentricidad, se plantea adicionar una carga y un momento para tener la carga centrada. Como el centro de cargas está desplazado hacia la derecha-inferior con respecto al centro geométrico de la losa, debe aumentarse el peso del edificio hacia la izquierda-superior. Se emplea la siguiente expresión:

$$\frac{\Sigma P_i \cdot d_i + P_a \cdot d_a}{\Sigma P_i + P_a} = CM$$

En donde:

- $\Sigma P_i \cdot d_i$ Sumatoria del producto de las cargas verticales por su respectivo brazo de palanca
- P_a Carga adicional necesaria para centrar las cargas
- d_a Distancia al punto de aplicación de la carga adicional
- CM Centro de masa

Resolviendo la ecuación anterior, para un peso unitario del concreto ciclópeo igual, $\gamma = 22 \text{ kN/m}^3$, el volumen de concreto será igual a:

$$V_{xy} = 65.85 \text{ m}^3$$

5.3.6.3. Cimentación del edificio en sistema de muros en mampostería reforzada:

La Tabla 30 muestra la carga vertical de cada punto, necesaria para calcular el centro de cargas de la placa de cimentación.

Tabla 30: Cálculo del centro de cargas de la cimentación para la edificación con sistema estructural de muros en mampostería reforzada

| BASE | P TOTAL | COORDENADAS | | MX | MY |
|------|---------|------------------|------------------|--------|----------|
| | kN | Coordenada X (m) | Coordenada Y (m) | kN*m | kN*m |
| 506 | 123.514 | 1.16 | 2.51 | 143.28 | 310.02 |
| 507 | 167.611 | 1.16 | 0.00 | 194.43 | 0.00 |
| 508 | 36.154 | 2.51 | 0.00 | 90.75 | 0.00 |
| 509 | 145.416 | 3.58 | 2.51 | 520.59 | 364.99 |
| 510 | 145.416 | 3.58 | 0.00 | 520.59 | 0.00 |
| 511 | 116.202 | 5.60 | 0.00 | 650.73 | 0.00 |
| 512 | 32.035 | 4.66 | 0.00 | 149.15 | 0.00 |
| 513 | 111.808 | 0.00 | 5.00 | 0.00 | 558.86 |
| 514 | 109.478 | 0.00 | 2.51 | 0.00 | 274.79 |
| 515 | 59.634 | 0.00 | 5.76 | 0.00 | 343.49 |
| 516 | 59.634 | 0.00 | 8.38 | 0.00 | 499.73 |
| 517 | 284.034 | 0.00 | 7.07 | 0.00 | 2,008.12 |
| 518 | 284.005 | 2.99 | 7.07 | 849.17 | 2,007.91 |
| 519 | 33.094 | 2.99 | 7.80 | 98.95 | 258.03 |
| 520 | 33.095 | 2.99 | 6.34 | 98.95 | 209.92 |

| | | | | | |
|-----|---------|-------|-------|----------|----------|
| 521 | 84.698 | 2.99 | 5.76 | 253.25 | 487.86 |
| 522 | 84.085 | 2.99 | 3.54 | 251.41 | 297.68 |
| 523 | 83.991 | 5.60 | 3.54 | 470.35 | 297.33 |
| 524 | 87.458 | 3.75 | 3.54 | 327.97 | 309.60 |
| 525 | 144.267 | 4.31 | 5.76 | 621.79 | 830.98 |
| 526 | 144.267 | 4.31 | 3.54 | 621.79 | 510.70 |
| 527 | 123.442 | 5.60 | 2.51 | 691.27 | 309.84 |
| 528 | 39.987 | 4.44 | 2.51 | 177.54 | 100.37 |
| 529 | 109.39 | 0.00 | 11.63 | 0.00 | 1,271.94 |
| 530 | 111.726 | 0.00 | 9.14 | 0.00 | 1,021.36 |
| 531 | 124.979 | 1.16 | 11.63 | 144.98 | 1,453.50 |
| 532 | 167.214 | 1.16 | 14.14 | 193.97 | 2,364.40 |
| 533 | 35.086 | 2.51 | 14.14 | 88.07 | 496.12 |
| 534 | 3.691 | 2.72 | 11.63 | 10.04 | 42.93 |
| 535 | 145.415 | 3.58 | 14.14 | 520.59 | 2,056.16 |
| 536 | 145.415 | 3.58 | 11.63 | 520.59 | 1,691.17 |
| 537 | 39.974 | 4.44 | 11.63 | 177.48 | 464.90 |
| 538 | 123.394 | 5.60 | 11.63 | 691.01 | 1,435.07 |
| 539 | 116.352 | 5.60 | 14.14 | 651.57 | 1,645.22 |
| 540 | 32.22 | 4.65 | 14.14 | 149.82 | 455.59 |
| 541 | 3.691 | 2.72 | 2.51 | 10.04 | 9.26 |
| 542 | 44.618 | 4.97 | 5.76 | 221.75 | 257.00 |
| 543 | 44.605 | 6.93 | 5.76 | 309.11 | 256.92 |
| 544 | 112.768 | 6.72 | 8.38 | 757.80 | 944.99 |
| 545 | 112.768 | 6.72 | 5.76 | 757.80 | 649.54 |
| 546 | 54.39 | 7.36 | 8.38 | 400.31 | 455.79 |
| 547 | 54.408 | 4.97 | 8.38 | 270.41 | 455.94 |
| 548 | 144.267 | 4.31 | 8.38 | 621.79 | 1,208.96 |
| 549 | 144.267 | 4.31 | 10.60 | 621.79 | 1,529.23 |
| 550 | 87.458 | 3.75 | 10.60 | 327.97 | 927.05 |
| 551 | 83.991 | 5.60 | 10.60 | 470.35 | 890.30 |
| 552 | 84.081 | 2.99 | 10.60 | 251.40 | 891.26 |
| 553 | 84.703 | 2.99 | 8.38 | 253.26 | 709.81 |
| 556 | 99.403 | 15.48 | 2.51 | 1,538.76 | 249.50 |
| 557 | 153.913 | 15.48 | 0.00 | 2,382.58 | 0.00 |
| 558 | 73.936 | 14.13 | 0.00 | 1,044.72 | 0.00 |
| 559 | 145.416 | 13.06 | 2.51 | 1,899.14 | 364.99 |
| 560 | 145.416 | 13.06 | 0.00 | 1,899.14 | 0.00 |
| 561 | 116.215 | 11.04 | 0.00 | 1,283.02 | 0.00 |
| 562 | 32.028 | 11.98 | 0.00 | 383.82 | 0.00 |

| | | | | | |
|------|---------|-------|-------|----------|----------|
| 563 | 111.808 | 16.64 | 5.00 | 1.860.49 | 558.86 |
| 564 | 109.478 | 16.64 | 2.51 | 1.821.72 | 274.79 |
| 565 | 59.634 | 16.64 | 5.76 | 992.31 | 343.49 |
| 566 | 59.634 | 16.64 | 8.38 | 992.31 | 499.73 |
| 567 | 284.063 | 16.64 | 7.07 | 4,726.82 | 2,008.32 |
| 568 | 284.092 | 13.65 | 7.07 | 3,877.87 | 2,008.52 |
| 569 | 99.476 | 13.65 | 5.76 | 1.357.85 | 572.98 |
| 570 | 96.697 | 13.65 | 3.54 | 1.319.92 | 342.33 |
| 571 | 73.655 | 11.05 | 3.54 | 813.89 | 260.74 |
| 572 | 76.285 | 12.89 | 3.54 | 983.32 | 270.05 |
| 573 | 159.043 | 12.33 | 5.76 | 1.961.01 | 916.09 |
| 574 | 156.888 | 12.33 | 3.54 | 1.934.44 | 555.38 |
| 575 | 123.454 | 11.04 | 2.51 | 1.362.94 | 309.87 |
| 576 | 39.976 | 12.20 | 2.51 | 487.71 | 100.34 |
| 577 | 109.479 | 16.64 | 11.63 | 1.821.74 | 1.273.24 |
| 578 | 111.808 | 16.64 | 9.14 | 1.860.49 | 1.022.11 |
| 579 | 98.137 | 15.48 | 11.63 | 1.519.16 | 1.141.33 |
| 580 | 154.215 | 15.48 | 14.14 | 2,387.25 | 2,180.60 |
| 581 | 74.9 | 14.13 | 14.14 | 1.058.34 | 1.059.09 |
| 582 | 3.718 | 13.92 | 11.63 | 51.75 | 43.24 |
| 583 | 145.218 | 13.06 | 14.14 | 1.896.55 | 2,053.38 |
| 584 | 145.217 | 13.06 | 11.63 | 1.896.54 | 1.688.87 |
| 585 | 39.618 | 12.20 | 11.63 | 483.34 | 460.76 |
| 586 | 123.049 | 11.05 | 11.63 | 1.359.69 | 1.431.06 |
| 587 | 116.015 | 11.05 | 14.14 | 1.281.97 | 1.640.45 |
| 588 | 31.874 | 11.99 | 14.14 | 382.17 | 450.70 |
| 589 | 3.718 | 13.92 | 2.51 | 51.75 | 9.33 |
| 590 | 81.605 | 11.67 | 5.76 | 952.33 | 470.04 |
| 591 | 80.328 | 9.28 | 5.76 | 745.44 | 462.69 |
| 592 | 80.328 | 9.28 | 8.38 | 745.45 | 673.15 |
| 593 | 81.605 | 11.67 | 8.38 | 952.33 | 683.85 |
| 594 | 159.043 | 12.33 | 8.38 | 1.961.01 | 1.332.78 |
| 595 | 156.888 | 12.33 | 10.60 | 1.934.44 | 1.663.01 |
| 596 | 87.315 | 12.89 | 10.60 | 1.125.49 | 925.54 |
| 597 | 83.84 | 11.05 | 10.60 | 926.43 | 888.70 |
| 598 | 96.662 | 13.65 | 10.60 | 1.319.44 | 1.024.62 |
| 599 | 99.436 | 13.65 | 8.38 | 1.357.30 | 833.27 |
| 600 | 257.046 | 8.32 | 5.76 | 2,138.62 | 1.480.58 |
| 601 | 256.472 | 8.32 | 0.48 | 2,133.85 | 123.10 |
| 1155 | 257.046 | 8.32 | 8.38 | 2,138.62 | 2,154.05 |

| | | | | | |
|----------|------------------|------|-------|------------------|------------------|
| 1156 | 256.472 | 8.32 | 13.66 | 2,133.85 | 3,503.41 |
| Σ | 10.435.76 | | | 86,692.97 | 73,873.56 |

(Fuente propia)

La Tabla 31 muestra las coordenadas del centro de masa y el centro de cargas de la placa de cimentación.

Tabla 31: Centro de masa y centro de carga de la placa de cimentación para el sistema estructural de muros de mampostería estructural

| Punto | Coord. X (m) | Coord. Y (m) |
|--------------|--------------|--------------|
| C. de masa | 8.22 | 6.58 |
| C. de cargas | 8.31 | 7.08 |

(Fuente propia)

La Figura 28 muestra de manera esquemática la localización del centro de masa y el centro de cargas de la placa de cimentación.

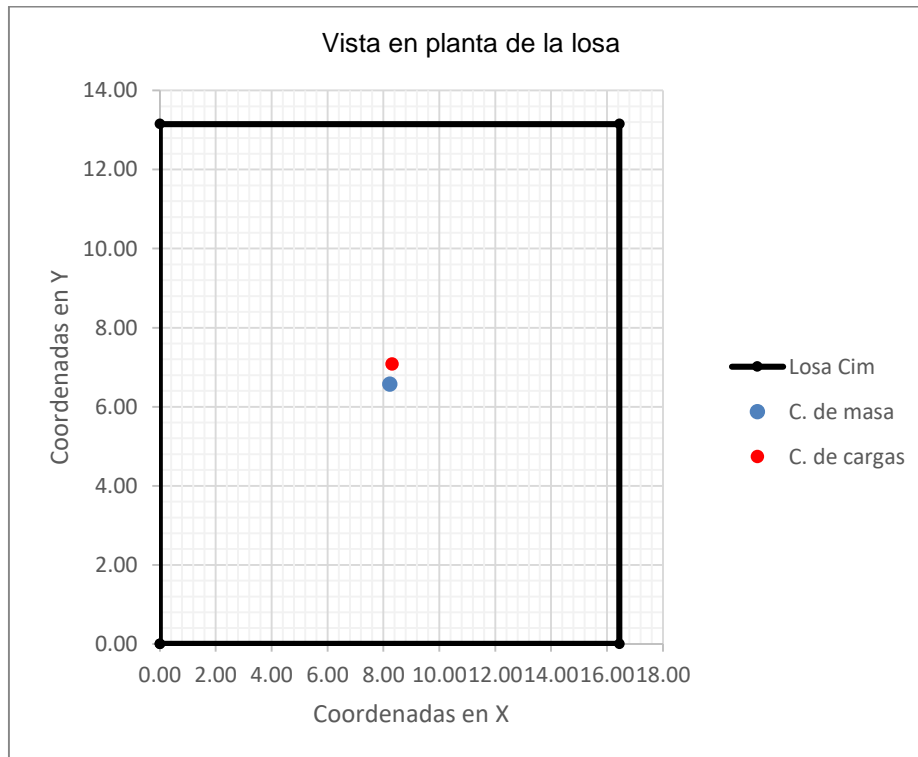


Figura 28: Localización del centro de masa y el centro de cargas de la placa de cimentación para el sistema estructural de muros de mampostería

La distancia entre ambos puntos, medida en ambas direcciones, es igual a la excentricidad. Las excentricidades, calculadas para cada dirección, son las siguientes:

ex 0.09 m Excentricidad en X
ey -0.50 m Excentricidad en Y

De acuerdo con los resultados obtenidos se puede observar que hay excentricidad en ambas direcciones. Sin embargo, se busca que en la cimentación el centro de cargas sea igual al centro de masa, esto con el propósito de considerar una presión uniforme sobre el terreno.

Es necesario entonces determinar la altura de la placa de cimentación para posterior, hacer la corrección para el cumplimiento de excentricidad igual a cero. El espesor de la placa de cimentación se ha evaluado mediante un proceso iterativo, empleando la ecuación de Winkler, la cual se muestra a continuación:

$$\beta = \frac{K_s}{\sqrt[4]{\frac{4E_c I}{B}}}$$

El parámetro de rigidez del sistema tipo viga T invertida se ha calculado multiplicando la ecuación anterior por el valor de la mayor longitud entre ejes de columnas para las vigas. La siguiente relación muestra la variación entre la rigidez necesaria para lograr un cimiento rígido y un cimiento flexible, se considera una relación de rigidez adecuada al valor medio de estos dos intervalos:

$$\beta L \begin{cases} \text{Si } \beta L = \frac{\pi}{4} \rightarrow \text{Cimiento rígido} \\ \text{Si } \beta L = \frac{\pi}{2} \rightarrow \text{Cimiento flexible} \end{cases}$$

El segundo momento de área o momento de inercia de la sección compuesta (viga T invertida), se ha calculado según el teorema de Steiner o teorema de los ejes paralelos. La Tabla 32 resume los realizados.

Tabla 32: Momento de inercia de la sección compuesta (viga T invertida) para el sistema de muros de carga

| Sección | B (m) | H (m) | yi (m) | Ai (m ²) | Ai * yi (m3) | di (m) | Io (m4) | Ai*di ² |
|---------|-------|-------|--------|-----------------------|--------------|--------|---------|--------------------|
| Patín | 1.00 | 0.20 | 0.100 | 0.20 | 0.020 | 0.188 | 0.0007 | 0.007 |
| Alma | 0.25 | 0.64 | 0.522 | 0.16 | 0.084 | 0.234 | 0.0055 | 0.009 |
| Σ | | | | 0.36 | 0.104 | | 0.006 | 0.016 |

(Fuente propia)

El centro de gravedad de la sección, medido desde la fibra inferior del cimiento es:

$$y_b = 28.80\text{cm}$$

El segundo momento de área de la sección transversal, es:

$$I_{viga T} = 0.022 m^4$$

La magnitud de la inercia fue empleada en la ecuación del parámetro de rigidez del cimiento, considerando un valor intermedio, el cual corresponde a:

$$\beta L = 0.84m$$

La geometría de cada uno de los elementos que componen la placa de cimentación, se resume en la Tabla 33.

Tabla 33: Datos de la geometría de la placa de cimentación para el sistema de muros de carga

| | | |
|--------|------|-------------------------|
| e (m) | 0.07 | Espesor loseta superior |
| t (m) | 0.20 | Espesor loseta inferior |
| e (m) | 0.25 | Ancho de las viguetas |
| h (m) | 0.84 | Altura de las viguetas |
| hl (m) | 0.64 | Alma viga |
| s (m) | 1.00 | Separación de viguetas |
| hl (m) | 0.57 | Altura libre |

(Fuente propia)

Una vez definida la geometría de la losa, se procede a la evaluación de cargas de la misma y con esto, se podrá finalmente calcular el peso actuante de la edificación. Vale la pena resaltar que, aunque no se haya realizado un análisis detallado de las vigas aéreas, por simplicidad, se ha supuesto que el considerar el peso de la losa uniforme en toda el área de los entrepisos, es equivalente a tener en cuenta el peso de las vigas. El peso por m², por el peso propio de la placa de cimentación, se muestra en la Tabla 34.

Tabla 34: Pesos de la cimentación

| Descripcion | peso |
|---------------------------|-------------------------------|
| Loseta superior | 1.68 kN/m ² |
| Loseta inferior | 4.80 kN/m ² |
| Caseton de guadua | 0.35 kN/m ² |
| Viguetas | 3.84 kN/m ² |
| Pisos y acabados | 1.20 kN/m ² |
| Cielo raso | 0.00 kN/m ² |
| Total carga muerta | 11.87 kN/m² |

(Fuente propia)

Para anular la excentricidad, se plantea adicionar una carga y un momento para tener la carga centrada. Como el centro de cargas está desplazado hacia la derecha-inferior con respecto al centro geométrico de la losa, debe aumentarse el peso del edificio hacia la izquierda-superior. Se emplea la siguiente expresión:

$$\frac{\sum P_i \cdot d_i + P_a \cdot d_a}{\sum P_i + P_a} = CM$$

En donde:

- $\sum P_i \cdot d_i$ Sumatoria del producto de las cargas verticales por su respectivo brazo de palanca
- P_a Carga adicional necesaria para centrar las cargas
- d_a Distancia al punto de aplicación de la carga adicional
- CM Centro de masa

Resolviendo la ecuación anterior, para un peso unitario del concreto ciclópeo igual, $\gamma = 22 \text{ kN/m}^3$, el volumen de concreto será igual a:

$$V_{xy} = 42.87 \text{ m}^3$$

5.3.7. Separación de las estructuras adyacentes:

Para los tres casos de sistemas estructurales, se tomó la distancia entre edificaciones más desfavorable que corresponde al análisis del sistema de pórticos, el cual es la estructura menos rígida. Según la NSR-10. De acuerdo con el tipo de colindancia, la separación entre estructuras se especifica en la Tabla 35.

Tabla 35: Separación sísmica mínima en la cubierta entre edificaciones colindantes que no hagan parte de la misma construcción.

| Altura de la edificación nueva | Tipo de Colindancia | | |
|--------------------------------|--|---|--|
| | Exista edificación vecina que no ha dejado la separación sísmica requerida | | No exista edificación vecina o la que existe ha dejado la separación sísmica requerida |
| | Coinciden las losas de entrepiso | No coinciden las losas de entrepiso | |
| 1 y 2 pisos | no requiere separación | no requiere separación | no requiere separación |
| 3 pisos | no requiere separación | 0.01 veces la altura de la edificación nueva (1% de h_n) | no requiere separación |
| Más de 3 pisos | 0.02 veces la altura de la edificación nueva (2% de h_n) | 0.03 veces la altura de la edificación nueva (3% de h_n) | 0.01 veces la altura de la edificación nueva (1% de h_n) |

- Notas:**
- Para obtener la separación sísmica en pisos diferentes a la cubierta se aplicará el coeficiente indicado en la Tabla multiplicado por la altura sobre el terreno del piso en particular.
 - Cuando el terreno en la colindancia sea inclinado en el sentido del paramento, o haya diferentes alturas de piso o diferentes números de pisos aéreos en la colindancia, se tomará en la edificación nueva la altura de piso, o el número de pisos aéreos que conduzca a la mayor separación sísmica.

(Fuente: NSR-10. Tabla A.6.5-1)

La separación es medida De acuerdo con la siguiente Figura 29.

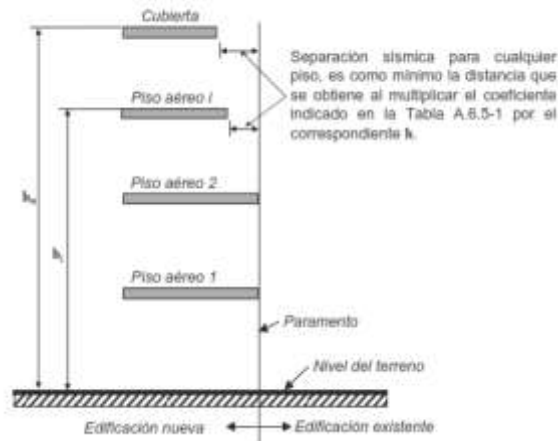


Figura 29: Medición de la separación sísmica (Vista en elevación). (NSR-10. Figura A.6.5-1)

De acuerdo con la geometría de la estructura tipificada, y según lo referido anteriormente, la separación de las estructuras adyacentes por sismo se lista en la Tabla 36.

Tabla 36: Separación sísmica mínima

| Nivel | hn (m) | separación (m) |
|-------------------------------|--------|----------------|
| Piso1 | 3.00 | 0.06 |
| Piso2 | 6.00 | 0.12 |
| Piso3 | 9.00 | 0.18 |
| Piso4 | 12.00 | 0.24 |
| Piso5 | 15.00 | 0.30 |
| Separación sísmica mínima (m) | | 0.30 |

(Fuente propia)

5.4. Modelos matemáticos de la cimentación

5.4.1. Metodología de Winkler

Teniendo en cuenta los datos obtenidos en el numeral 5.3.5.1. “Cálculo de la capacidad admisible del suelo” y numeral 5.3.5.2. “Cálculo del asentamiento”, se obtiene el coeficiente de rigidez del suelo por la metodología de Winkler, en donde:

$$K_s = \frac{\sigma_{act}}{\delta_{esperada}} = \frac{\sigma_{adm}}{\delta_{asentamiento\ total}} = \frac{153.37\ kN/m^2}{0.054\ m} = 2840.19\ kN/m^3$$

Se llevó a cabo el análisis mediante el programa de uso estructural SAP2000 V23.1.0. aplicando las cargas resultantes del análisis estructural expuestos en el numeral 5.3.6. “Definición de la cimentación”.

5.4.1.1. Modelación cimentación de edificio en pórticos en concreto

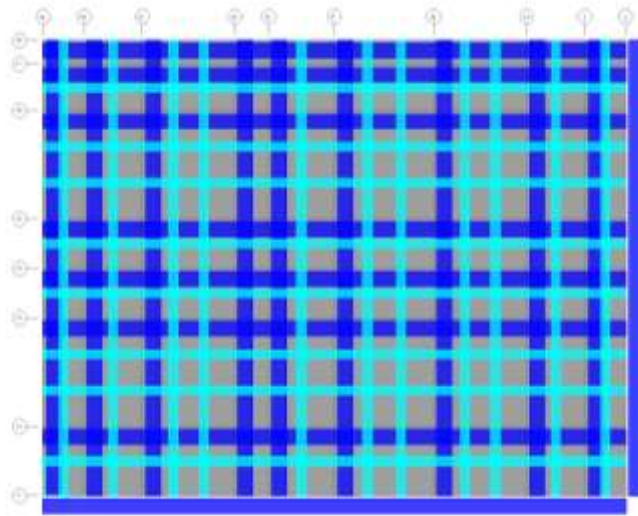


Figura 30: Modelo matemático XY de la placa de cimentación edificio en porticos – Método Winkler

De la Figura 30, las líneas azules oscuro corresponden a las vigas principales de la losa de cimentación y las líneas azul claro, a las viguetas. A continuación, se reflejan los resultados del modelo matemático de la cimentación para el edificio de pórticos en concreto.

5.4.1.1.1. Asentamientos diferenciales – Método de Winkler

Los cálculos realizados con el programa SAP2000 V23.1.0 permiten estimar los asentamientos diferenciales en la cimentación. Sin embargo, estos no estiman asentamientos totales, dado que el programa evalúa las deformaciones con respecto a los apoyos, que en este caso sería la ubicación de las cargas.

De acuerdo con la Figura 31, ocurren deformaciones de -0.02249m en el centro geométrico de la cimentación (Zona del esquema en color naranja) y de -0.03363m en los bordes de la losa (Zona del esquema en color morado). Estos valores son tomados de acuerdo con la configuración estructural del cimiento, teniendo en cuenta los ejes propuestos.

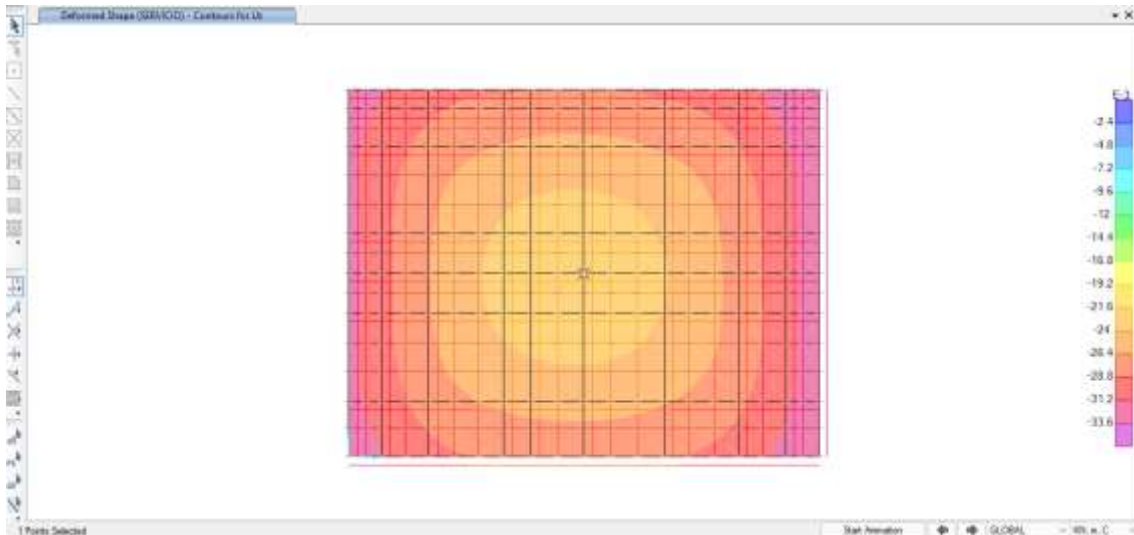


Figura 31: Diagrama de asentamientos diferenciales en metros del cimiento edificio porticos - metodo Winkler

5.4.1.1.2. Esfuerzos sobre el suelo – Método de Winkler

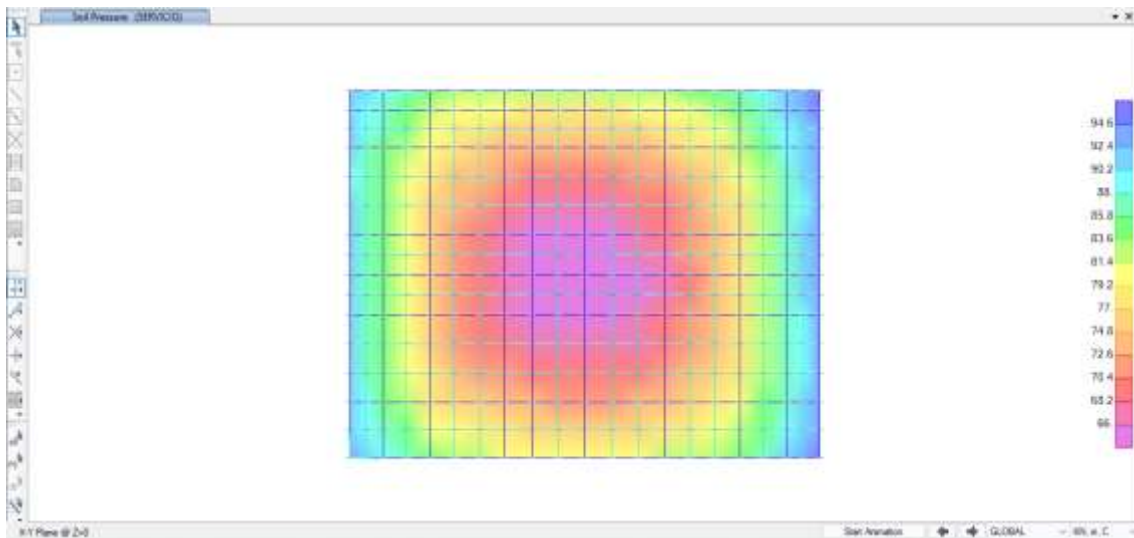


Figura 32: Diagrama de esfuerzos en kPa sobre el suelo cimentacion porticos - método Winkler

Como se ilustra en la Figura 32, los esfuerzos del suelo producidos por la acción del edificio oscilan entre los siguientes valores: σ -min=66 kN/m² localizado en el centro geométrico de la placa y σ -máx.=94.6 kN/m², el cual está por debajo del σ -adm. =153.37 kN/m².

5.4.1.1.3. Momentos y cortantes en la cimentación – Método de Winkler

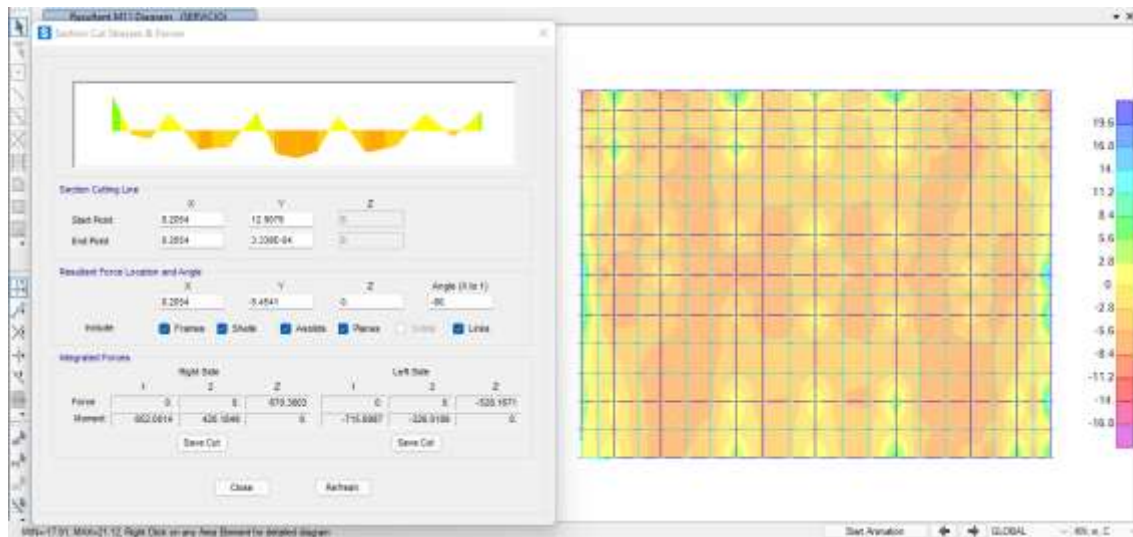


Figura 33: Diagrama de momentos en kN m M11 (XX) eje F– método Winkler

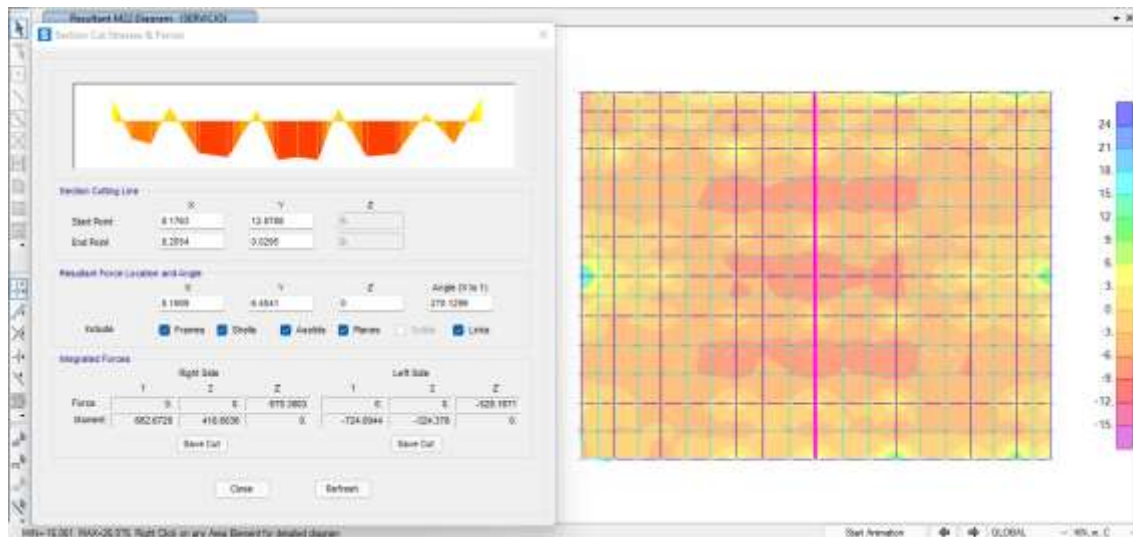


Figura 34: Diagrama de momentos en kN m M22 (YY) eje F– método Winkler

De acuerdo con las Figuras 33 y 34, los mayores momentos se presentan en la zona central de la placa de cimentación, siendo el valor máximo del momento en M11(XX) igual a 652 kN m y para el momento M22(YY) igual a 662.97 kN m; en sentido negativo, el valor menor del momento M11(XX) igual a -715.70 kN m y para el momento M22(YY) igual a -724.09 kN m

5.4.1.2. Modelación cimentación de edificio en muros de carga

En la Figura 35, se ilustra el modelo matemático de la cimentación para el edificio muros de carga, del cual, las líneas verdes oscuro corresponden a las vigas principales de la losa de cimentación y las líneas verde claro, a las viguetas. A continuación, se reflejan los resultados.

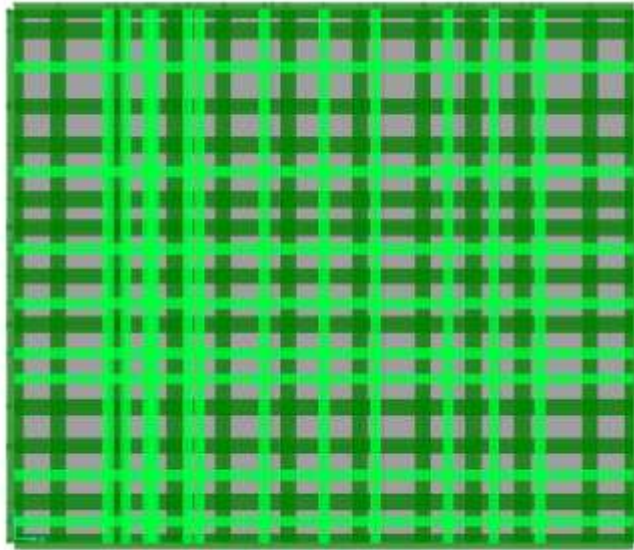


Figura 35: Modelo matemático XY de la placa de cimentación edificio en muros de carga – Método Winkler

5.4.1.2.1. Asentamientos diferenciales – Método de Winkler

Los cálculos realizados con el programa SAP2000 V23.1.0 permiten estimar los asentamientos diferenciales en la cimentación. Sin embargo, estos no estiman asentamientos totales, dado que el programa evalúa las deformaciones con respecto a los apoyos, que en este caso sería la ubicación de las cargas.

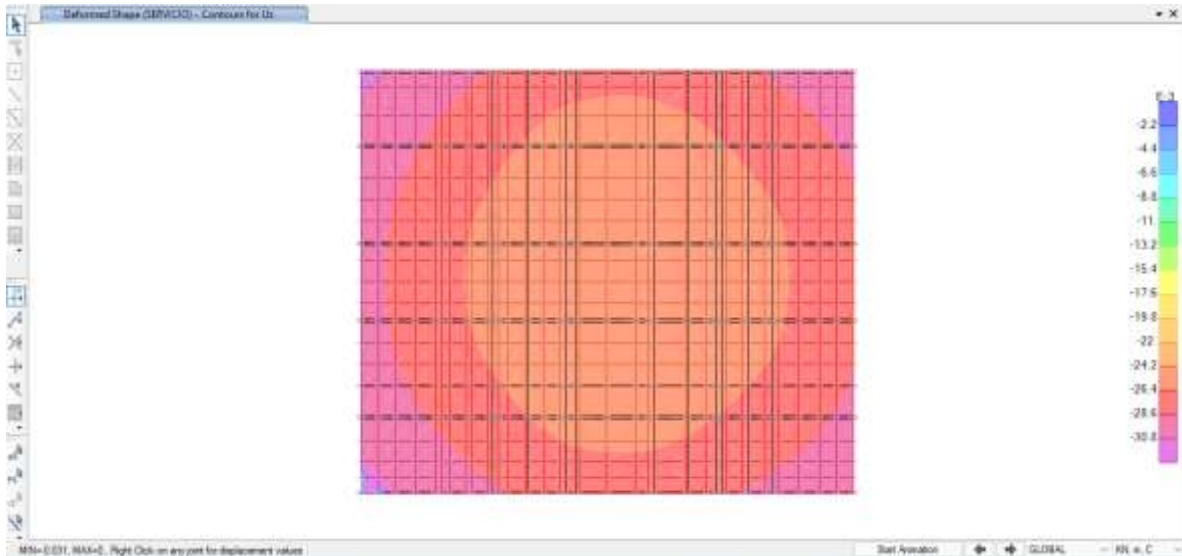


Figura 36: Diagrama de asentamientos diferenciales en metros del cimiento edificio muros de carga - metodo Winkler

De acuerdo con la Figura 36, se presentan deformaciones de -0.024 m en el centro superior de la cimentación (Zona del esquema en color amarillo) y de -0.03049 m en los bordes de la losa (Zona del esquema en color morado). Estos valores son tomados de acuerdo con la configuración estructural del cimiento, teniendo en cuenta los ejes propuestos.

5.4.1.2.2. Esfuerzos sobre el suelo – Método de Winkler

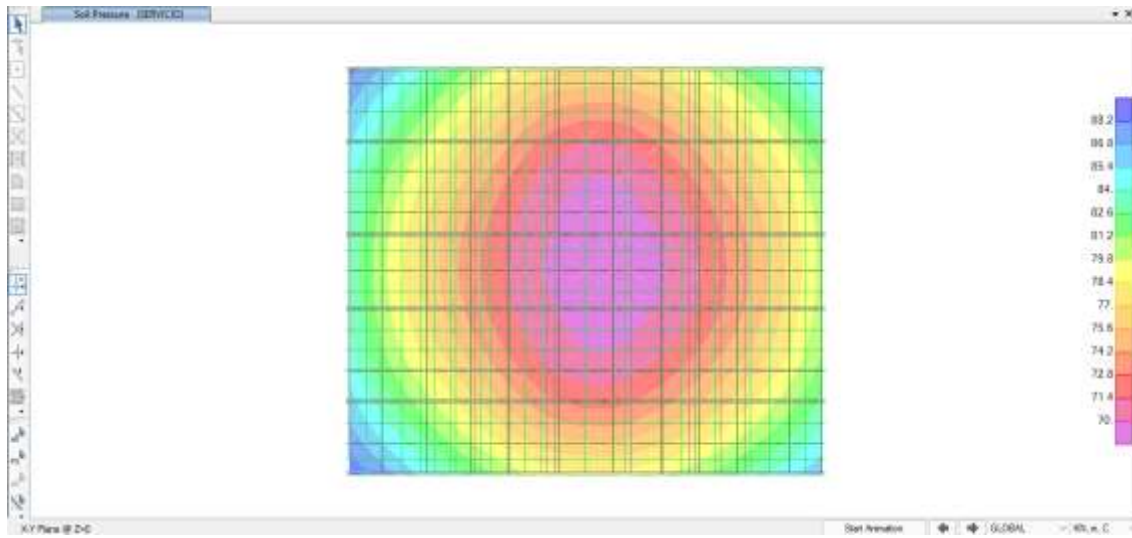


Figura 37: Diagrama de esfuerzos en kPa sobre el suelo cimentación muros de carga - método Winkler

Como se ilustra en la Figura 37 los esfuerzos del suelo producidos por la acción del edificio oscilan en los siguientes valores: σ -min=70 kN/m² localizado en el centro geométrico de la placa y σ -máx.=88.2 kN/m², el cual está por debajo del σ -adm. =153.37 kN/m².

5.4.1.2.3. Momentos y cortantes en la cimentación – Método de Winkler

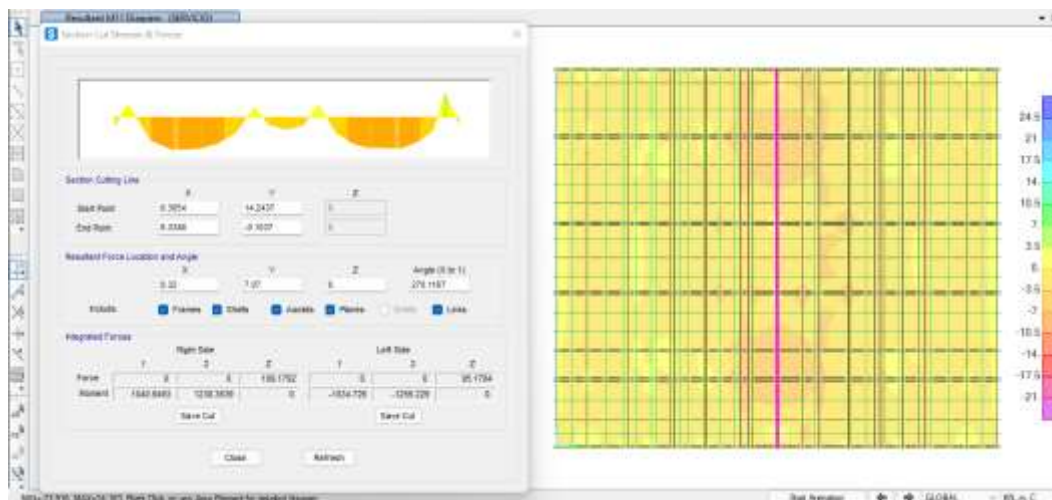


Figura 38: Diagrama de momentos en kN m M11 (XX) eje F- método Winkler



Figura 39: Diagrama de momentos en $kN\ m\ M^2\ (YY)$ eje F – método Winkler

De acuerdo con las Figuras 38 y 39, los mayores momentos se presentan en la zona intermedia superior e inferior de la placa de cimentación, siendo el valor máximo del momento en $M11(XX)$ igual a $1238.36\ kN\ m$ y para el momento $M22(YY)$ igual a $956.35\ kN\ m$; en sentido negativo, el valor menor del momento $M11(XX)$ igual a $-1256.23\ kN\ m$ y para el momento $M22(YY)$ igual a $-1044.45\ kN\ m$.

5.4.1.3. Modelación cimentación de edificio en muros en mampostería estructural

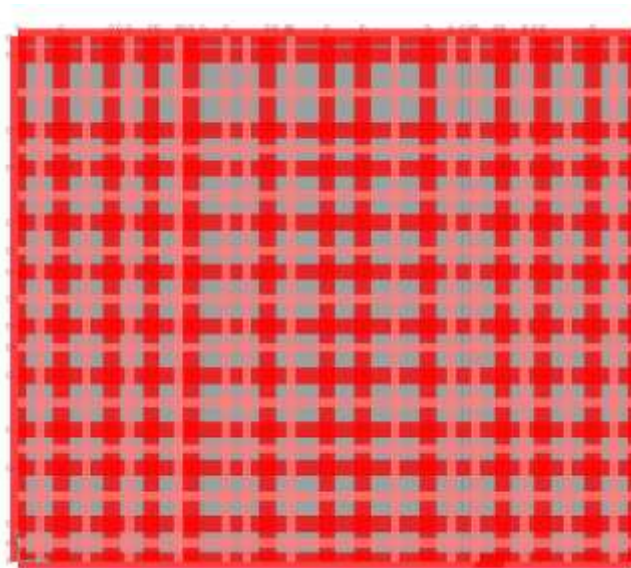


Figura 40: Modelo matemático XY de la placa de cimentación edificio en muros de mampostería estructural– Método Winkler

En la Figura 40, se ilustra el modelo matemático de la cimentación para el edificio en muros en mampostería estructural, del cual, las líneas rojo oscuro corresponden a las vigas principales de la losa de cimentación y las líneas de color rosado, a las viguetas. A continuación, se reflejan los resultados.

5.4.1.3.1. Asentamientos diferenciales – Método de Winkler

Los cálculos realizados con el programa SAP2000 V23.1.0 permiten estimar los asentamientos diferenciales en la cimentación. Sin embargo, estos no estiman asentamientos totales, dado que el programa evalúa las deformaciones con respecto a los apoyos, que en este caso sería la ubicación de las cargas.

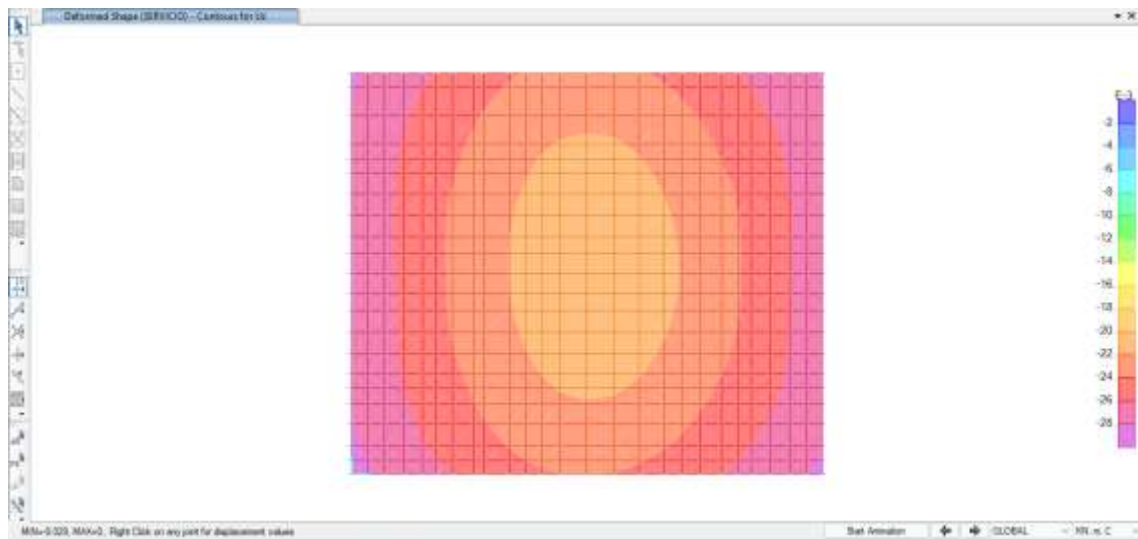


Figura 41: Diagrama de asentamientos diferenciales en metros del cimiento edificio muros en mampostería estructural - metodo Winkler

De acuerdo con la Figura 41, se presentan deformaciones de -0.02 en el centro de la cimentación (Zona del esquema en color naranja) y de -0.029 m en los bordes de la losa (Zona del esquema en color morado). Estos valores son tomados de acuerdo con la configuración estructural del cimiento, teniendo en cuenta los ejes propuestos.

5.4.1.3.2. Esfuerzos sobre el suelo – Método de Winkler

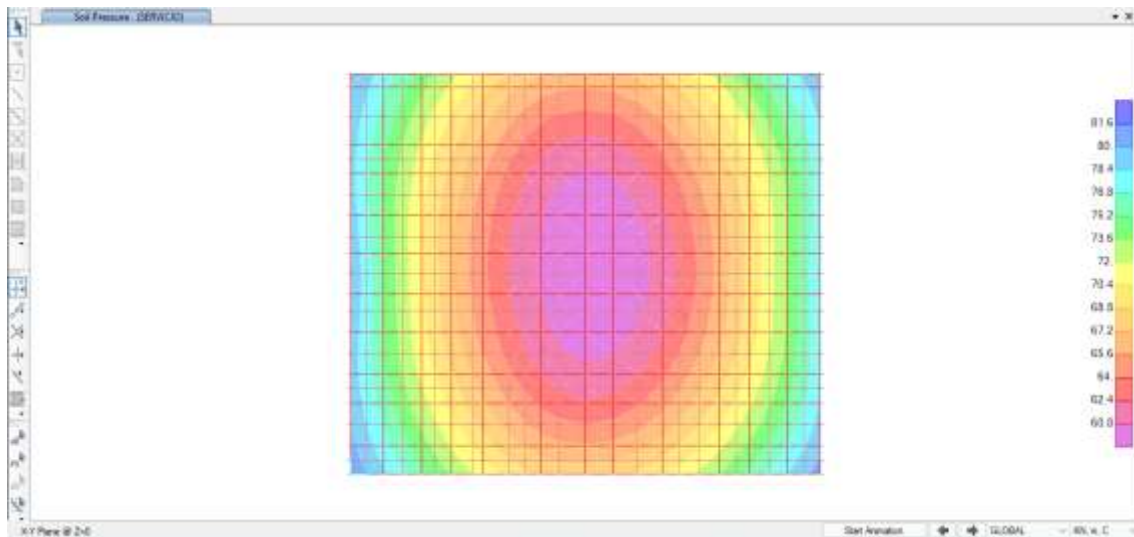


Figura 42: Diagrama de esfuerzos en kPa sobre el suelo cimentación muros en mampostería estructural - método Winkler

Como se ilustra en la Figura 42 los esfuerzos del suelo producidos por la acción del edificio oscilan entre los siguientes valores: σ -min=60.8 kN/m² localizado en el centro geométrico de la placa y σ -máx.=81.6 kN/m², el cual está por debajo del σ -adm. =153.37 kN/m².

5.4.1.3.3. Momentos y cortantes en la cimentación – Método de Winkler

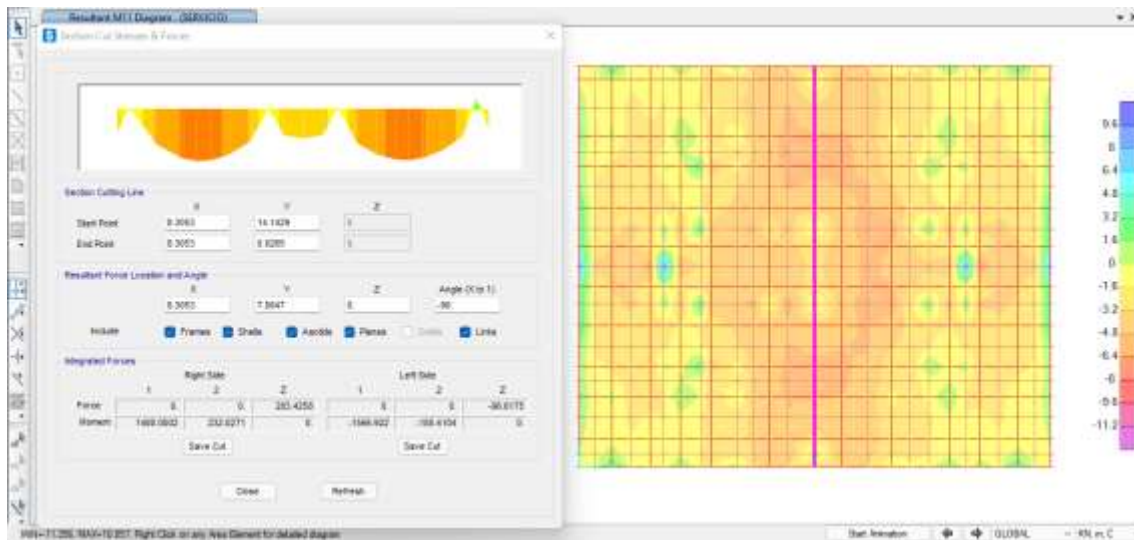


Figura 43: Diagrama de momentos en kN m M11 (XX) eje F- método Winkler

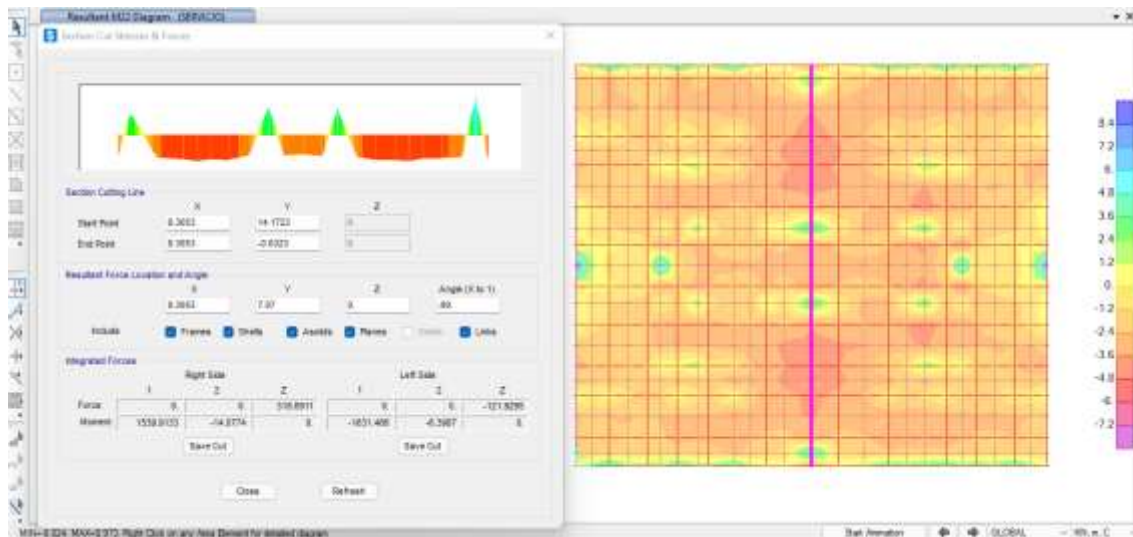


Figura 44: Diagrama de momentos en kN m M22 (YY) eje F– método Winkler

De acuerdo con las Figuras 43 y 44, los mayores momentos se presentan en la zona intermedia superior e inferior de la placa de cimentación, siendo el valor máximo del momento en M11(XX) igual a 1480 kN m y para el momento M22(YY) igual a 1539.91 kN m; en sentido negativo, el valor menor del momento M11(XX) igual a -1566.92 kN m y para el momento M22(YY) igual a -1631.47 kN m.

5.4.2. Metodología de elementos finitos

Los datos de entrada para del modelo constitutivo Soft Soil empleados en los cálculos mediante el programa de computador MIDAS GTS NX V20 2.1 se listan en la Tabla 37.

Tabla 37: Datos de entrada para el modelo Soft Soil

| Parámetro | Descripción |
|-------------|---|
| E'_s | Módulo de elasticidad de Young efectivo (kPa) |
| ν' | Relación de Poisson efectivo |
| γ | Peso unitario (kN/m ³) |
| K_0 | Coefficiente de presión de tierras en reposo |
| K_{NC} | Coefficiente de presión de tierras en reposo para suelos normalmente consolidados |
| e_0 | Relación de vacíos |
| λ^* | Índice de compresión modificado |
| κ^* | Índice de recompresión modificado |
| OCR | Relación de Sobreconsolidación |

| Parámetro | Descripción |
|-----------|--|
| c' | Cohesión efectiva del suelo (kPa) |
| ϕ' | Ángulo de Fricción efectivo ($^{\circ}$) |

Las magnitudes de las propiedades y los parámetros del suelo listados en la Tabla 38 se determinaron con base de los datos geotécnicos en el numeral 5.3.5. “Determinación de los parámetros del suelo”, incluidos en la Tabla 17.

Tabla 38: Magnitudes de las propiedades y parámetros del suelo.

| Suelo | Profundidad (m) | E'_s (kPa) | ν' | γ (kN/m ³) | γ_{sat} (kN/m ³) | K_o | K_{NC} | e_0 | λ^* | κ^* | OCR | c' | ϕ' |
|---------|-----------------|--------------|--------|-------------------------------|-------------------------------------|-------|----------|-------|-------------|------------|-----|------|---------|
| Suelo 1 | 0.00 - 1.00 | 15000 | 0.4 | 19 | 19.55 | 0.67 | 0.50 | 0.66 | 0.118 | 0.035 | 10 | 30 | 20 |
| Suelo 2 | 1.00 - 4.00 | 12000 | 0.4 | 16 | 21 | 0.53 | 0.63 | 0.50 | 0.125 | 0.05 | 3.2 | 25 | 22 |
| Suelo 3 | 4.00 - 7.00 | 10000 | 0.4 | 13 | 21 | 0.48 | 0.56 | 0.50 | 0.065 | 0.007 | 1.8 | 30 | 24 |
| Suelo 4 | 7.00 - 10.00 | 12000 | 0.4 | 16 | 21 | 0.47 | 0.54 | 0.50 | 0.057 | 0.006 | 1.5 | 30 | 25 |
| Suelo 5 | 10.00 - 32.88 | 13500 | 0.4 | 17 | 21 | 0.62 | 0.64 | 0.50 | 0.091 | 0.009 | 1.9 | 21 | 20.9 |

En la Figura 45 se ilustra el modelo bidimensional de análisis por elementos finitos de la sección de suelo de ancho $4B$ y espesor $2B$ (donde B es el ancho del cemento superficial). Se toma la sección de longitud más larga, que corresponde a $16.44m$, lo cual resulta en un espesor de análisis igual a $32.88m$. En la Figura 46 se presenta un esquema del volumen de suelo evaluado.

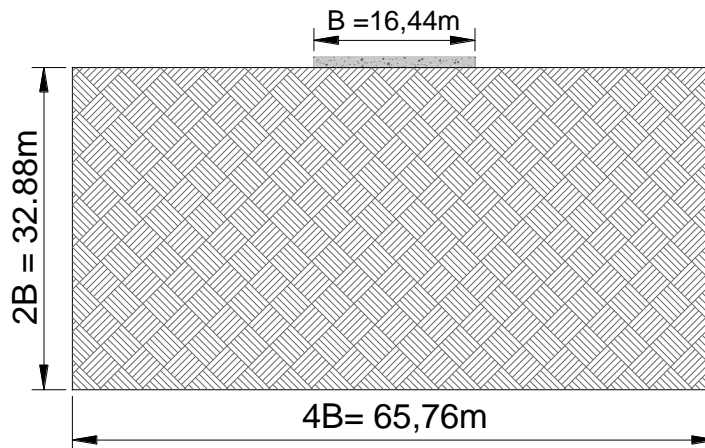


Figura 45: Esquema del volumen de suelo evaluado mediante elementos finitos

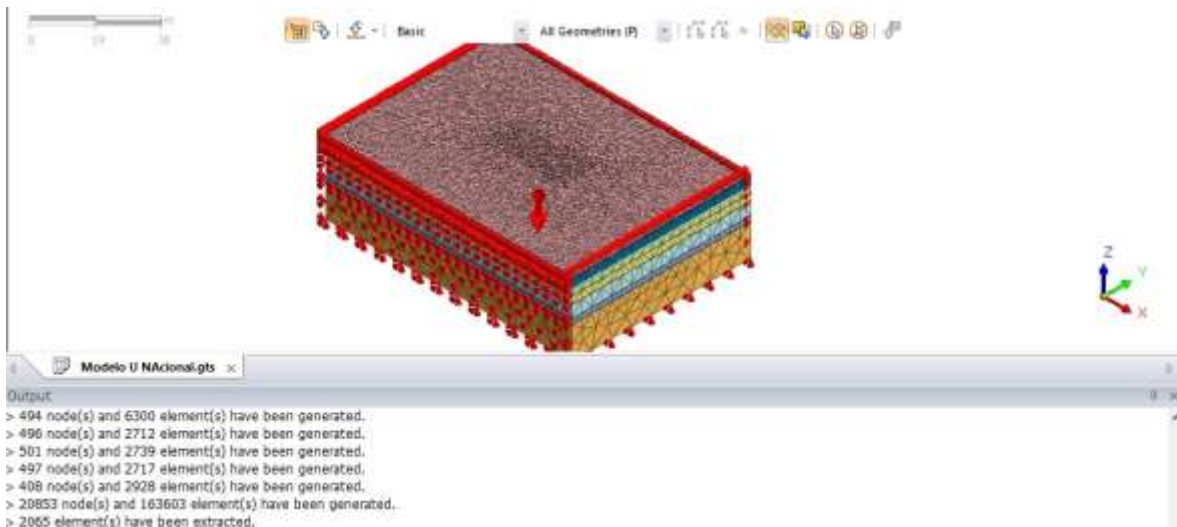


Figura 46: Modelo en 3D del volumen de suelo - modelación elementos finitos

5.4.2.1. Cimentación de edificio en pórticos en concreto

A continuación, se muestran los resultados del modelo matemático de la cimentación para el edificio de pórticos en concreto.

5.4.2.1.1. Asentamientos – Método de elementos finitos

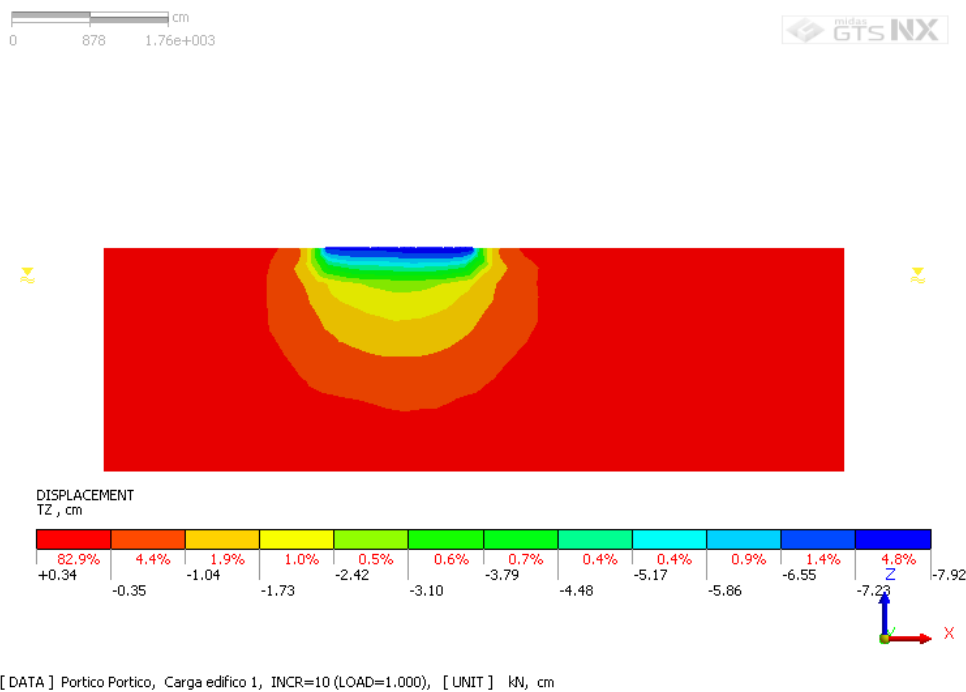


Figura 47: Asentamientos totales edificio 1 - Modelo elementos finitos

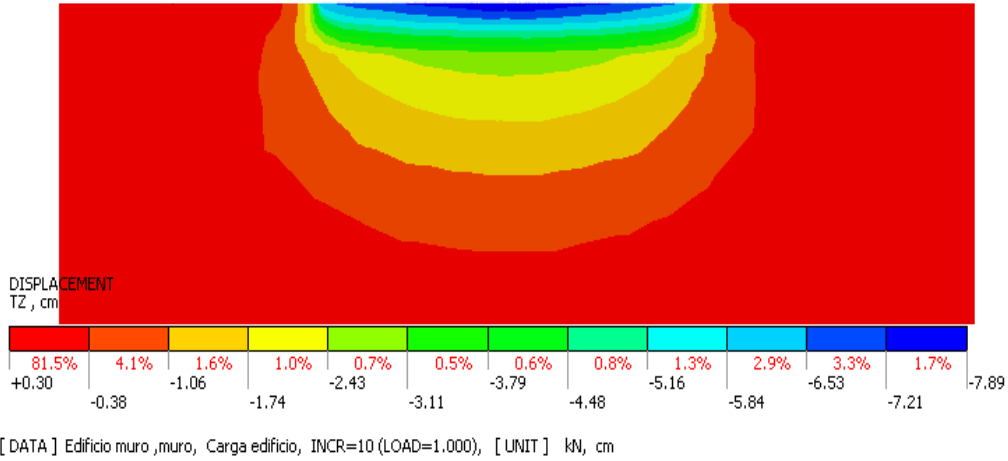


Figura 48: Asentamientos totales edificio 1 + edificio 2 carga simultánea - Modelo elementos finitos

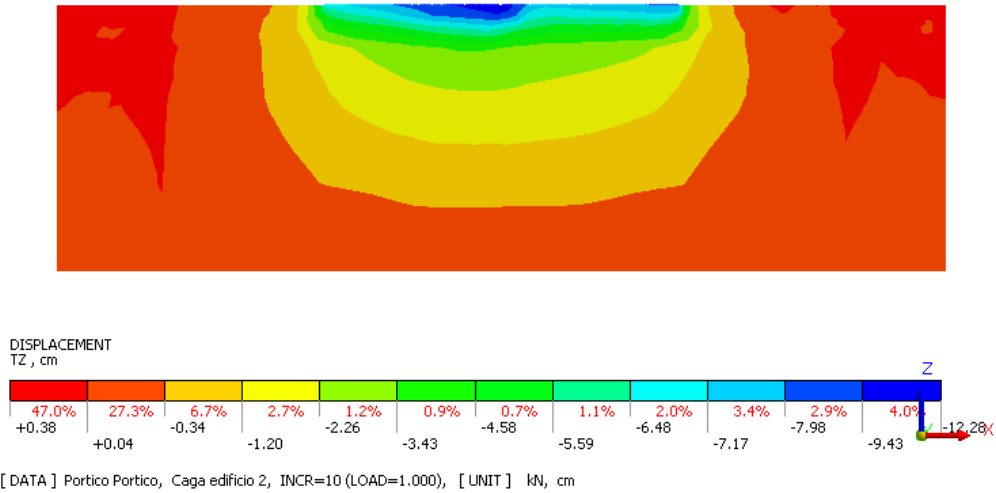


Figura 49: Asentamientos totales edificio 1 + edificio 2 carga posterior - Modelo elementos finitos

La Figura 47, la Figura 48 y la Figura 49 muestran que los asentamientos, teniendo en cuenta un edificio únicamente o ambos, tienen las magnitudes siguientes:

| | Una edificación | Dos edificios adyacentes Carga simultánea | Dos edificios adyacentes Edificio 2 cargado después de edificio 1 |
|---------------------|-----------------|--|--|
| Asentamiento total: | -7.92 cm | -9.66 cm | -12.28 cm |

En los tres casos, la magnitud de los asentamientos son inferiores a lo estipulado por la NSR-10. literal H.4.9.2 “Límites de asentamientos totales”, en donde se especifican asentamientos totales máximos permisibles calculado a 20 años, para construcciones aisladas de 30cm y para construcciones medianeras de 15cm (Reglamento Colombiano de Construcción Sismo Resistente NSR-10, 2010). Para el presente caso aplica el segundo criterio, Por otra parte, se tiene un aumento en el valor del asentamiento al pasar de una sola edificación a dos adyacentes.

5.4.2.1.2. Esfuerzos sobre el suelo – Método de elementos finitos

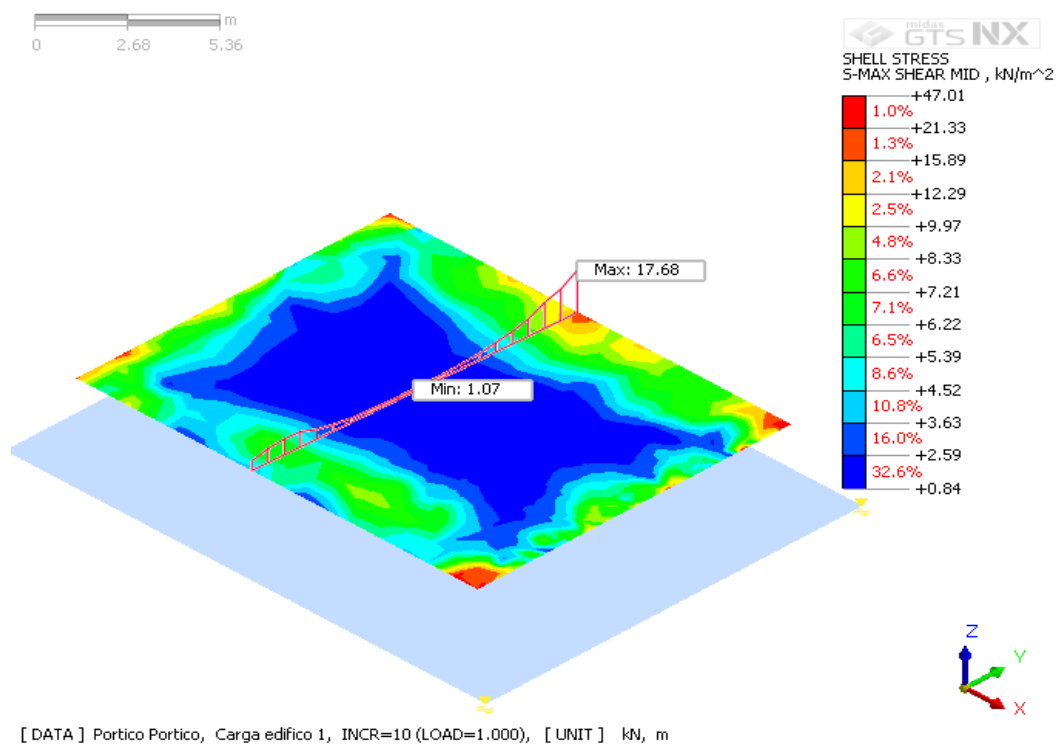
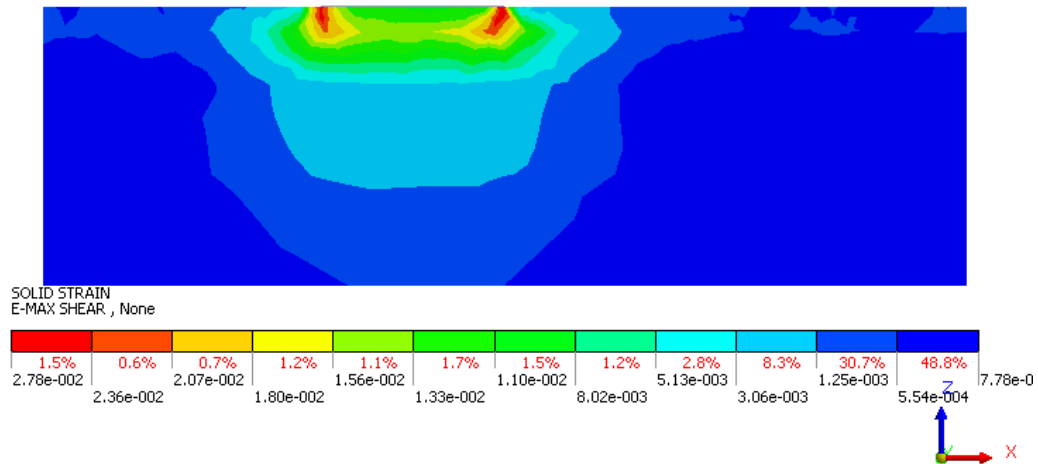
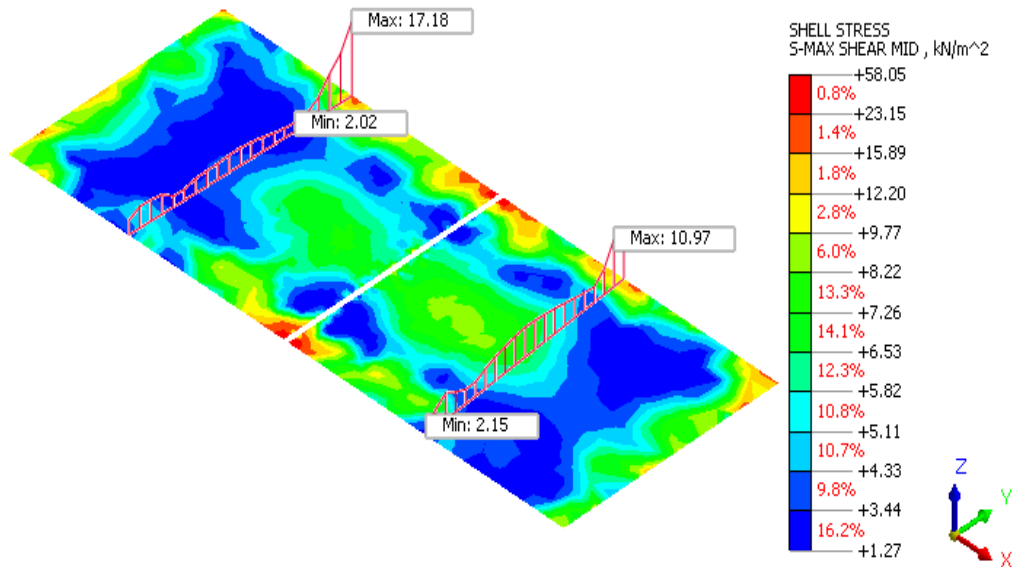


Figura 50: Esfuerzo cortante en losa para estructura portico en concreto – Metodo elementos finitos



[DATA] Portico Portico, Carga edificio 1, INCR=10 (LOAD=1.000), [UNIT] kN, cm

Figura 51: Deformación cortante máxima en el suelo en porcentaje por metro para estructura pórtico en concreto – Método elementos finitos



[DATA] Portico Portico-Edf. Simultaneos, Carga edificios, INCR=20 (LOAD=1.000), [UNIT] kN, m

Figura 52: Esfuerzo cortante en losa para estructura pórticos en concreto, acción simultanea – Método elementos finitos

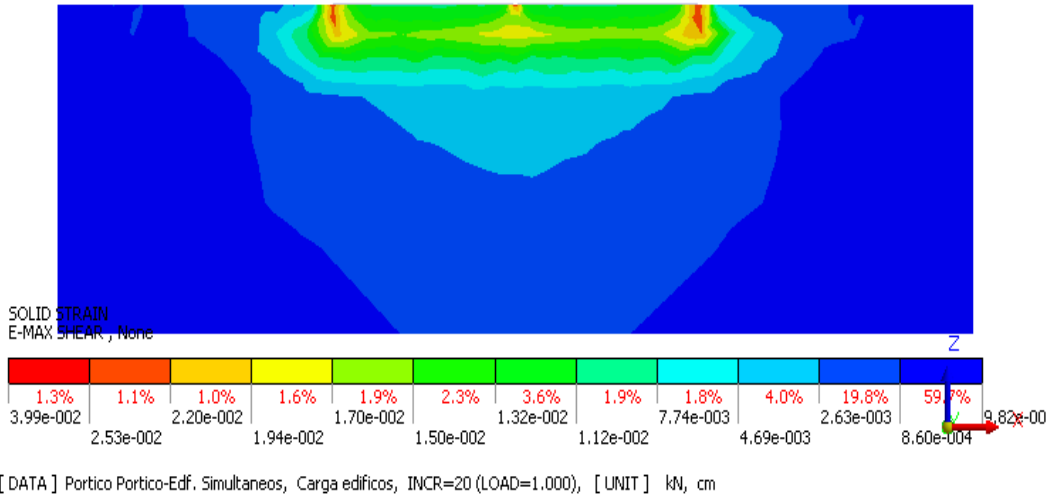


Figura 53: Deformación cortante máxima en el suelo en porcentaje por metro para estructura pórticos en concreto acción simultanea – Método elementos finitos

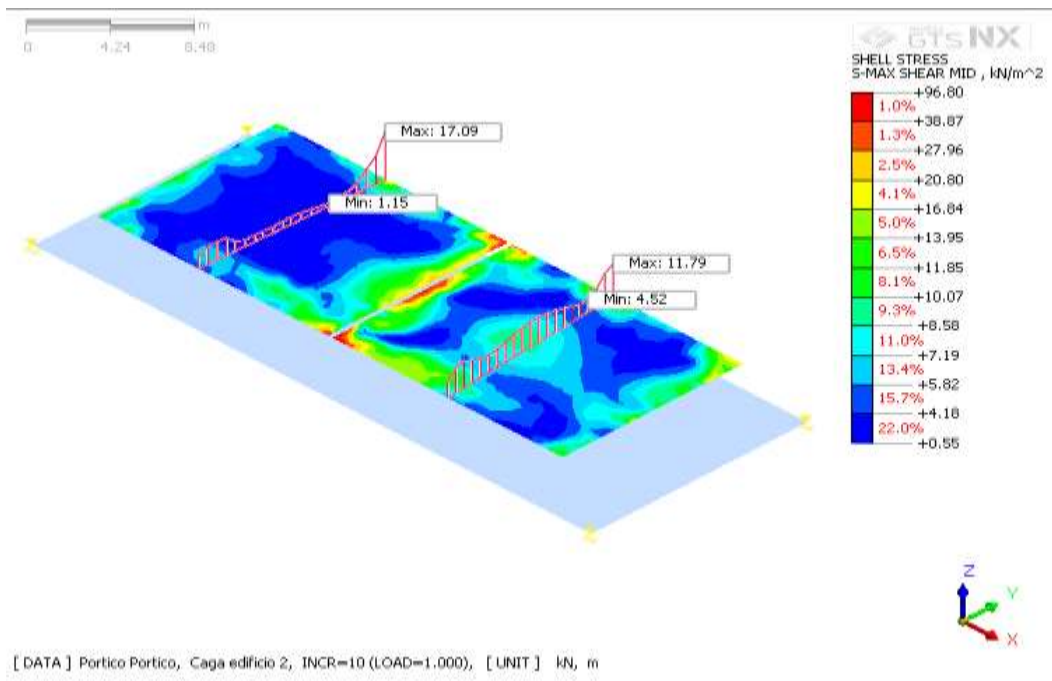


Figura 54: Esfuerzo cortante en losa para estructura pórticos en concreto, acción posterior edificio 2 – Método elementos finitos

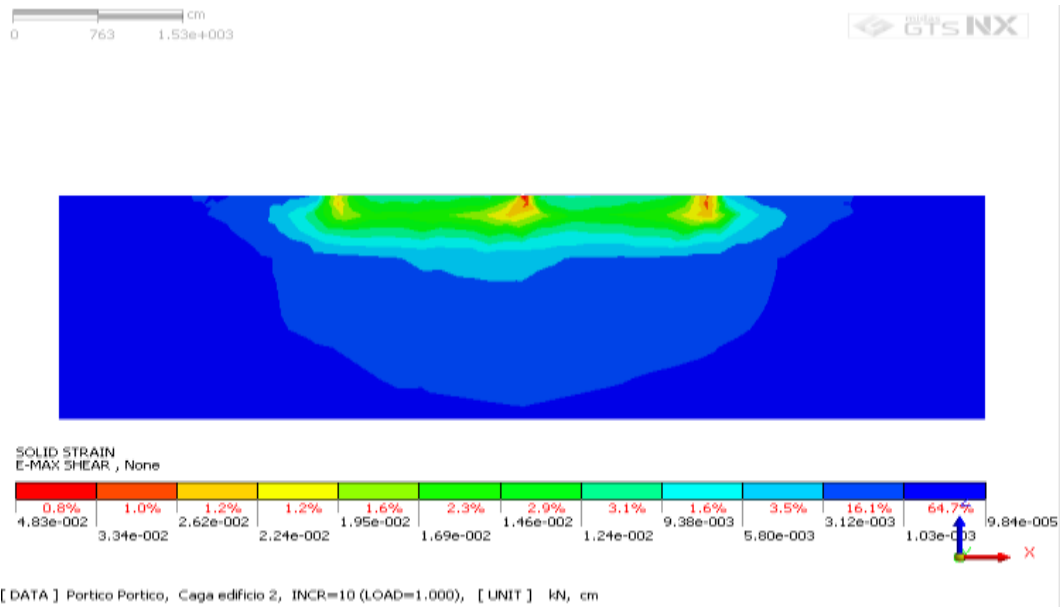


Figura 55: Deformación cortante máxima en el suelo en porcentaje por metro para estructura pórticos en concreto acción posterior edificio 2 – Método elementos finitos

En la Figura 50, Figura 52 y Figura 54 se muestran las magnitudes de los esfuerzos cortantes para los tres sistemas estructurales analizados mediante elementos finitos, son menores para una edificación y aumentan considerablemente ante la acción de dos estructuras adyacentes. El esfuerzo máximo en el primer caso es de 47.01kN/m², ante la acción simultánea de edificaciones aumenta a 58.05 kN/m², y en el caso de ser cargado de manera posterior el edificio 2 la magnitud del esfuerzo es de 96.80 kN/m².

En la Figura 51, Figura 53 y Figura 55 se muestran las magnitudes de las deformaciones cortantes en porcentaje por metro. La deformación máxima en el primer caso, considerando una sola estructura, es de 2.78%, presentando un aumento en la zona de colindancia al considerar la estructura adyacente cargada de manera simultánea en 3.99%, y con respecto a la tercera condición, la cual evalúa la estructura adyacente cargada de manera posterior, en 4.83%.

5.4.2.1.3. Momentos y cortantes en la cimentación – Método de elementos finitos

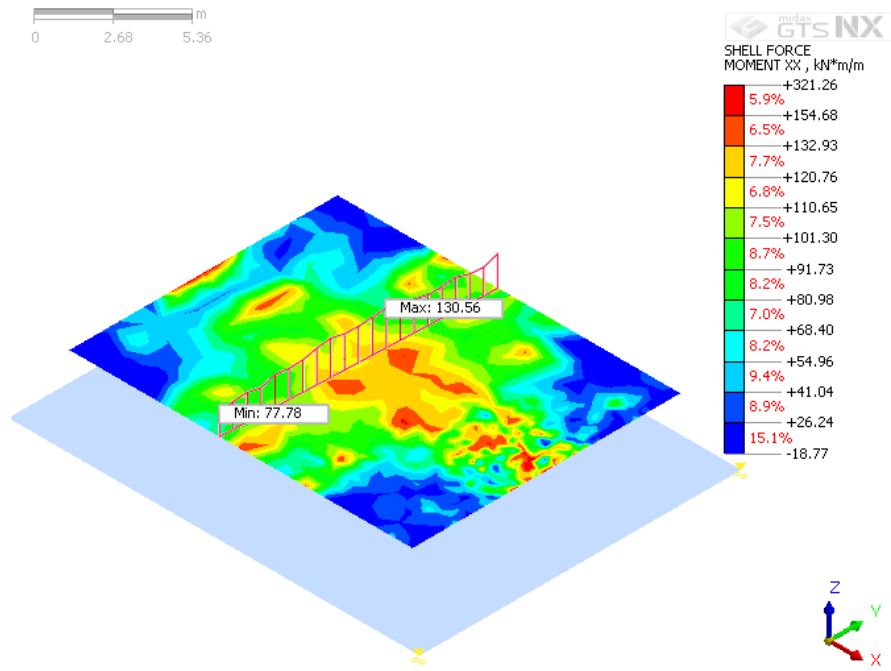


Figura 56: Diagrama de momentos (XX) eje F – método elementos finitos

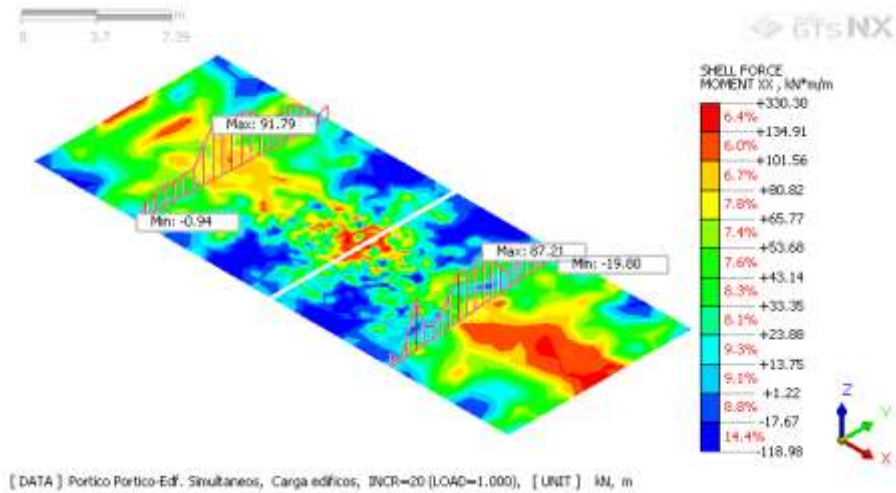


Figura 57: Diagrama de momentos (XX) accion simultanea de edificaciones adyacentes, eje F – método elementos finitos

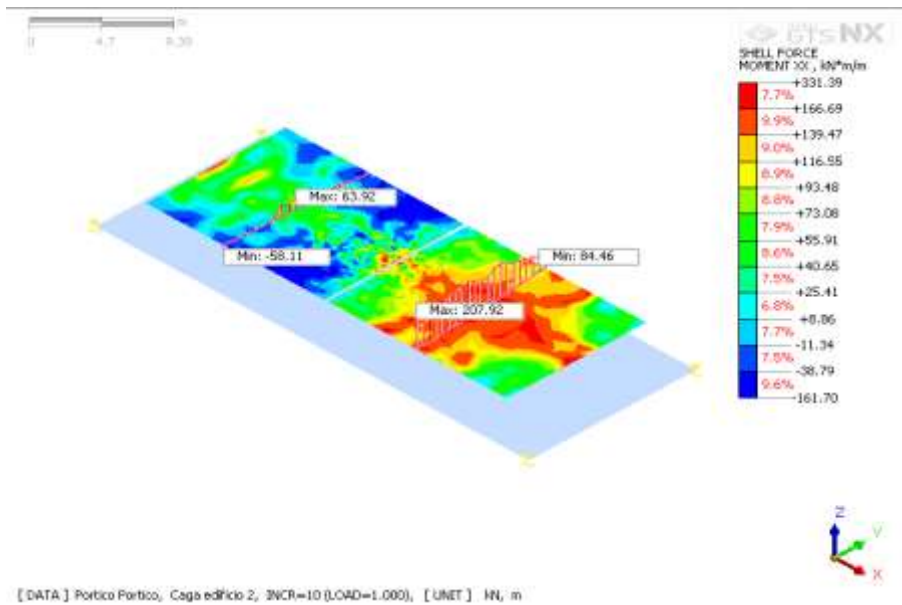


Figura 58: Diagrama de momentos (XX) carga 2 posterior de edificaciones adyacentes, eje F – método elementos finitos

En la Figura 56, la Figura 57 y la Figura 58 se muestran los momentos determinados a lo largo del eje x para los tres tipos de cimentaciones analizadas. Comparando con los momentos determinados para una sola edificación, ante la acción simultánea de dos edificaciones, ocurre un incremento de 9.04 kN*m, y un incremento de 10.13 kN*m, para la condición en la que se carga el segundo edificio posteriormente.

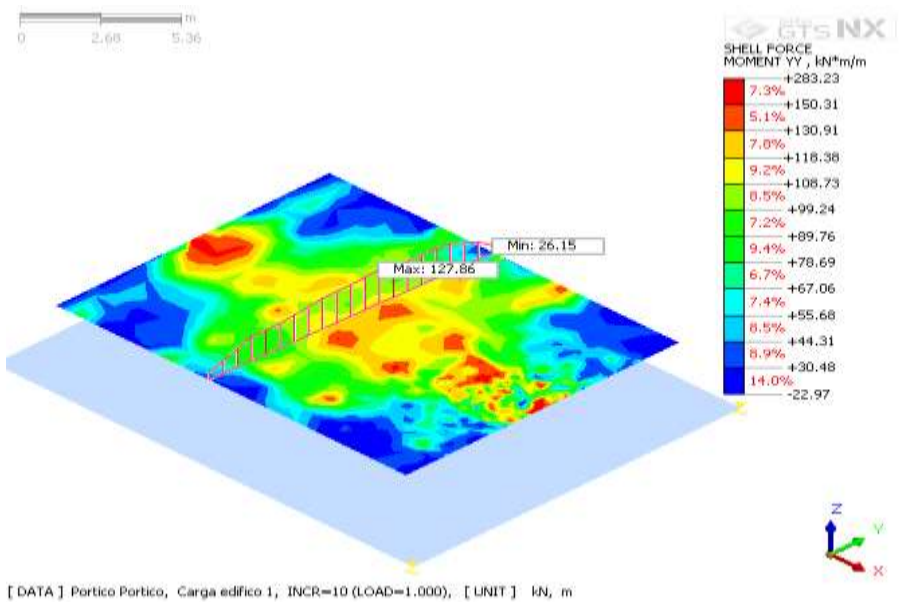


Figura 59: Diagrama de momentos (YY) eje F – método elementos finitos

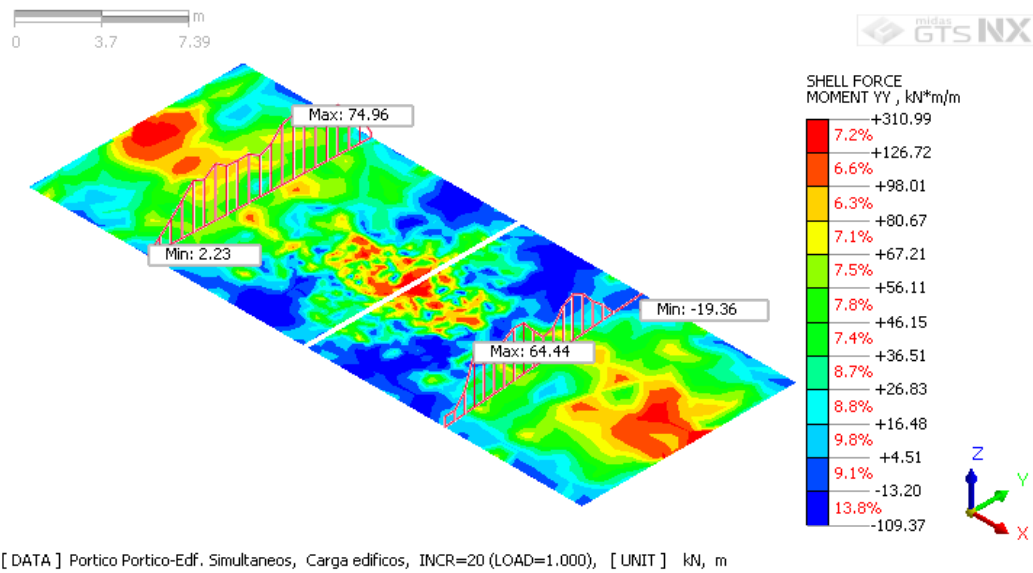


Figura 60: Diagrama de momentos (YY) accion simultanea de edificaciones adyacentes eje F – método elementos finitos

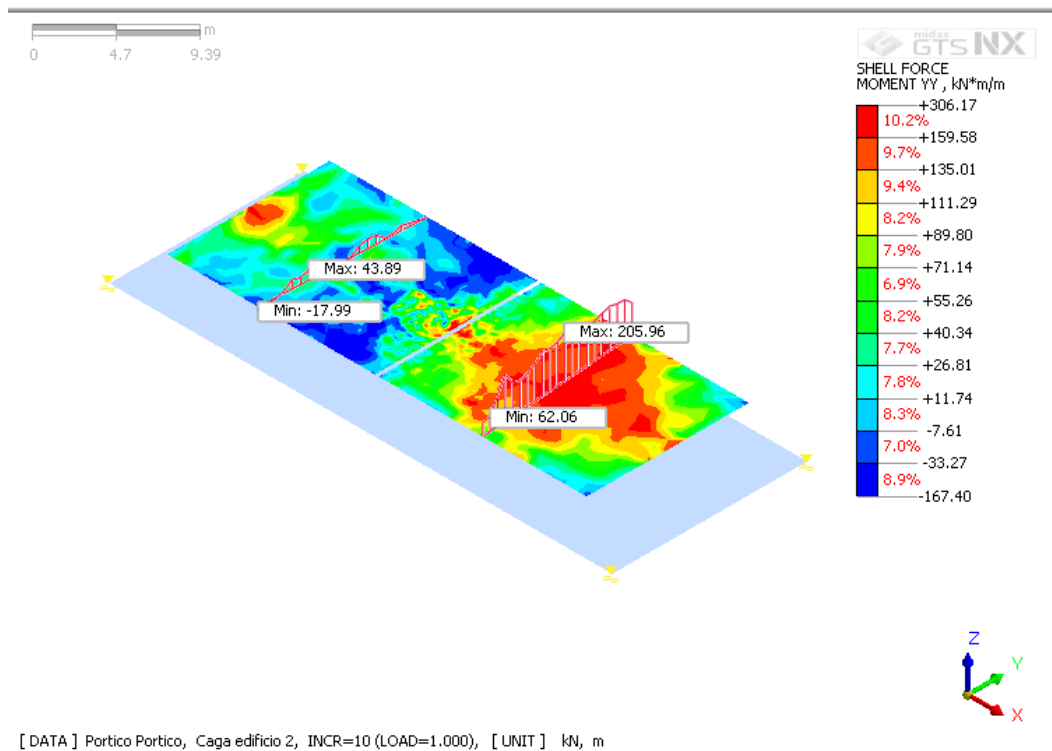
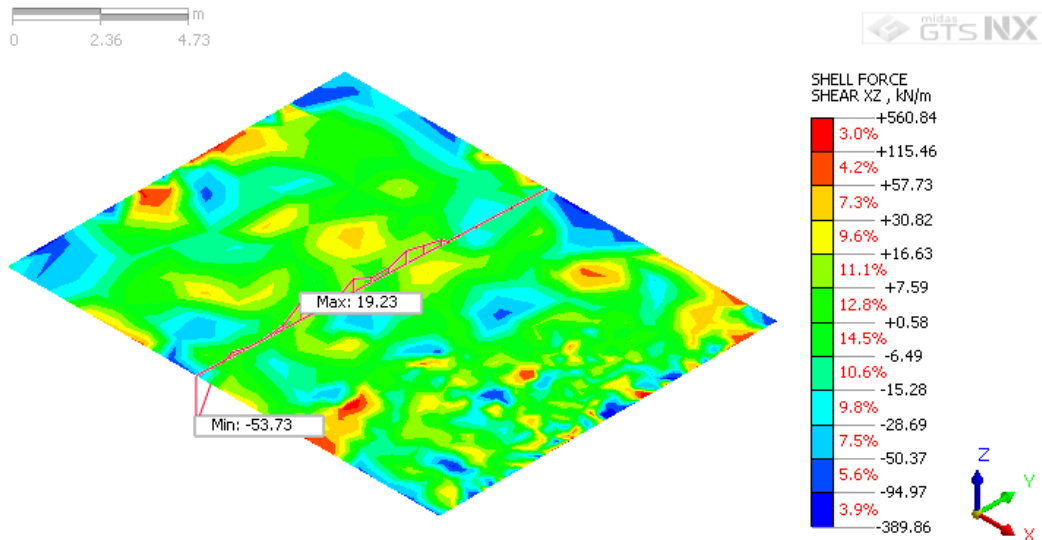


Figura 61: Diagrama de momentos (YY) edificio 2 cargado posterior de edificaciones adyacentes eje F – método elementos finitos

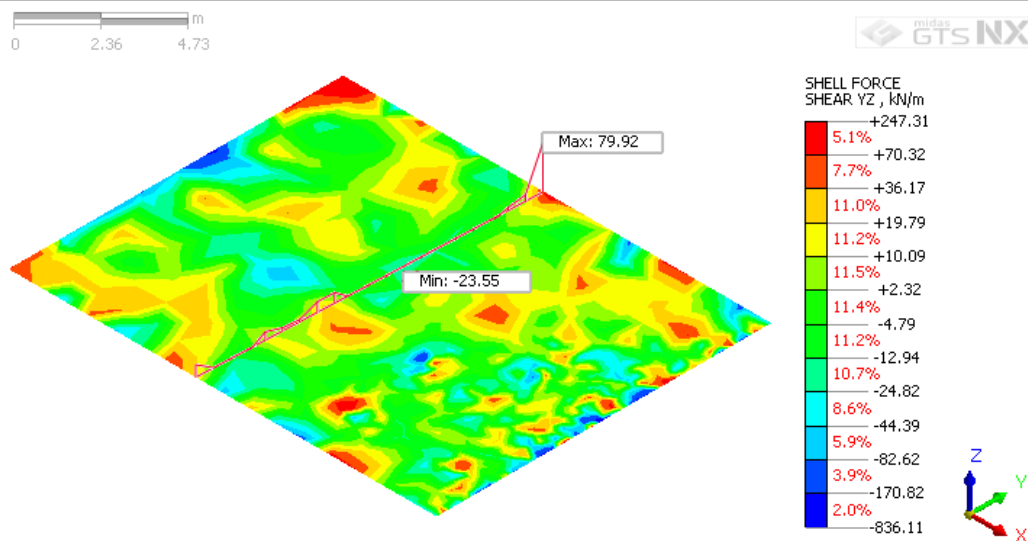
De acuerdo con los resultados de momentos para los ejes y (Ver Figura 59, Figura 60 y Figura 61), comparando con los resultados obtenidos para una sola edificación, ante la acción simultánea, ocurre

un incremento de 27.76 kN*m y se obtiene un incremento de 22.94 kN*m para la condición en la que se carga el segundo edificio posteriormente.



[DATA] Portico Portico-Edf. Simultaneos, Carga edificios, INCR=20 (LOAD=1.000), [UNIT] kN, m

Figura 62: Diagrama de Cortante (XZ) un edificio pórticos en concreto – método elementos finitos



[DATA] Portico Portico-Edf. Simultaneos, Carga edificios, INCR=20 (LOAD=1.000), [UNIT] kN, m

Figura 63: Diagrama de Cortante (YZ) edificio pórticos en concreto – método elementos finitos

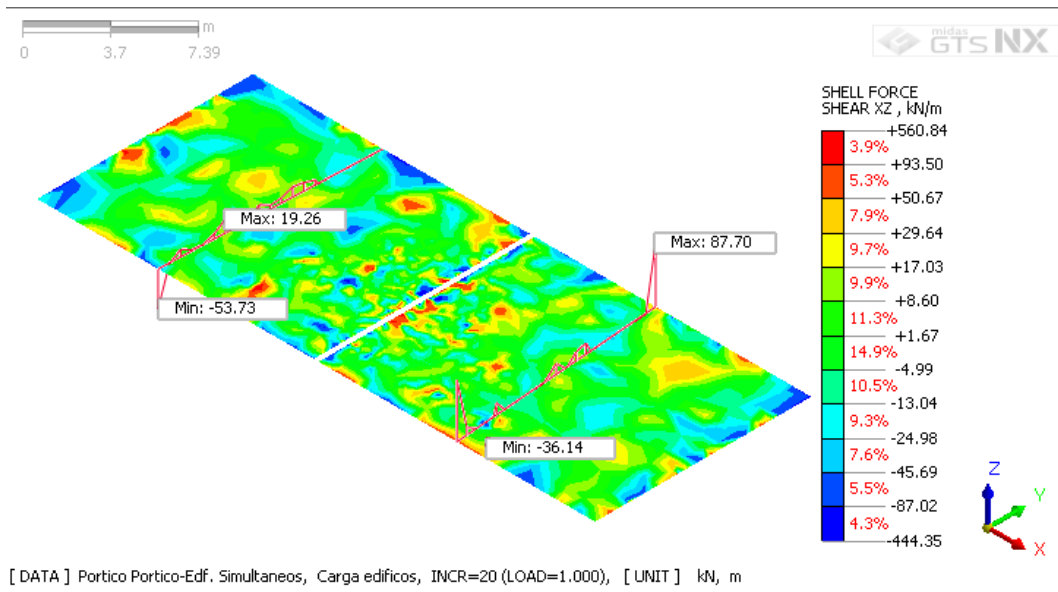


Figura 64: Diagrama de Cortante (XZ) p&ordotrticos en concreto de carga, carga simultânea – método elementos finitos

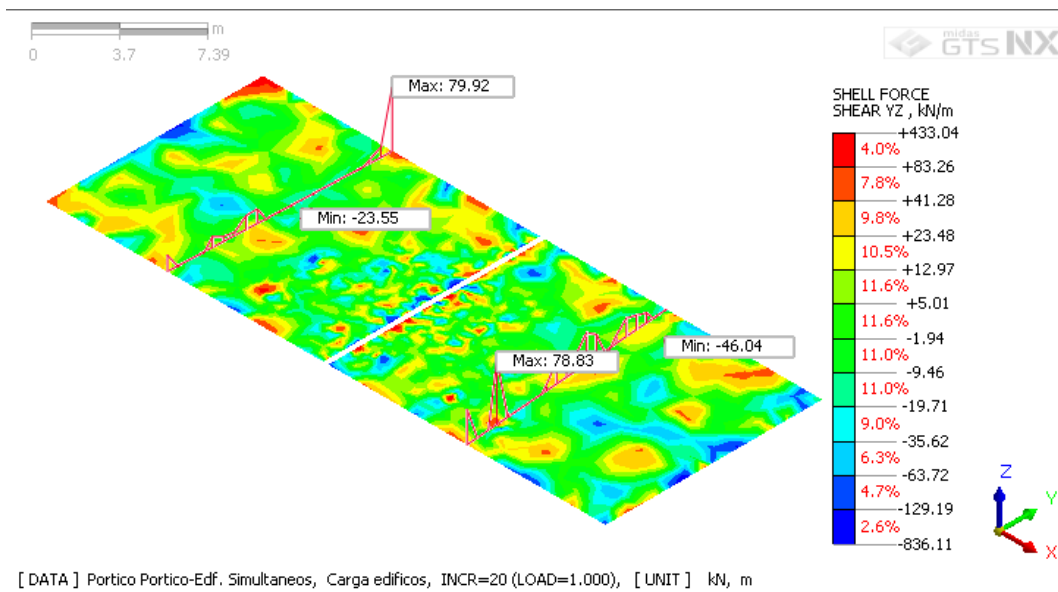


Figura 65: Diagrama de Cortante (YZ) p&ordotrticos en concreto de carga, carga simultânea – método elementos finitos

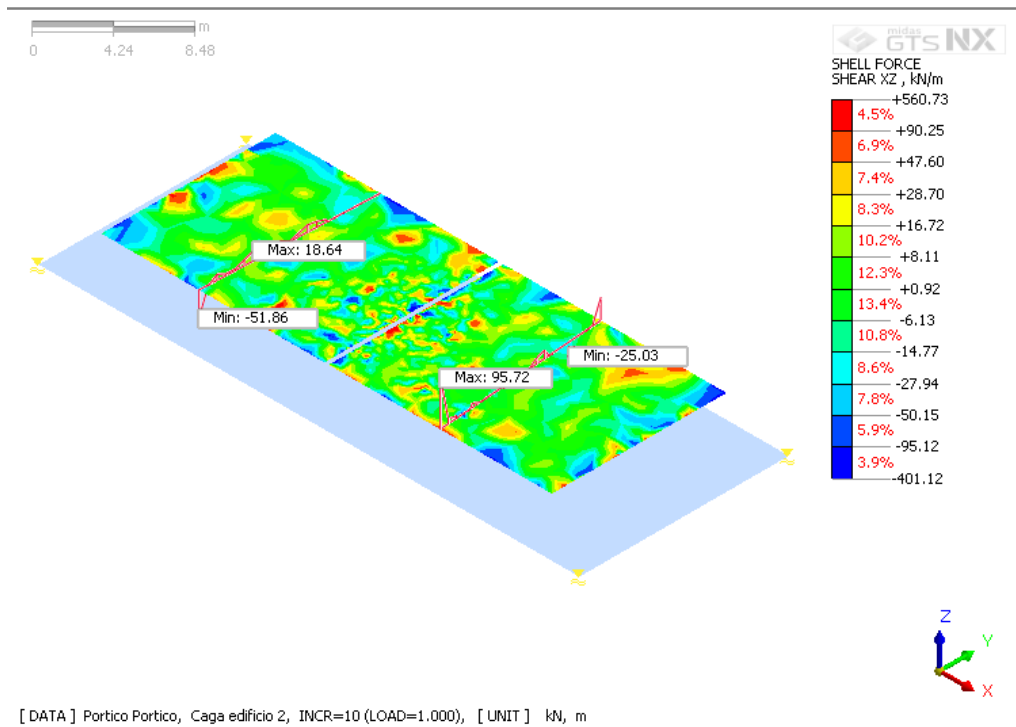


Figura 66: Diagrama de Cortante (XZ) pórticos en concreto de carga, 2do edificio cargado posteriormente – método elementos finitos

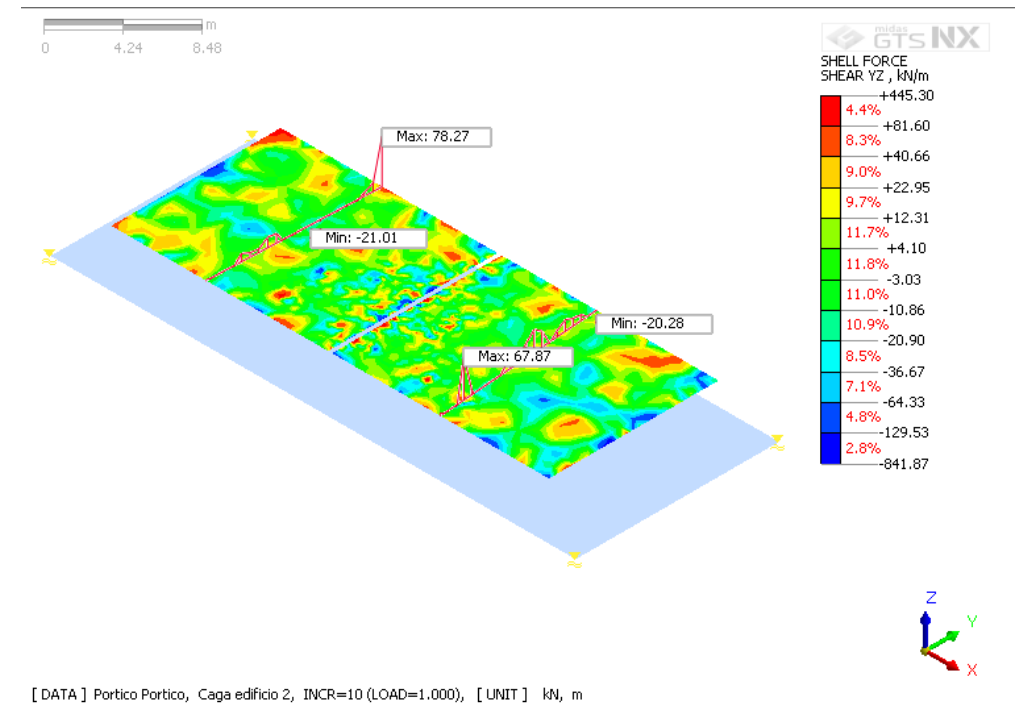


Figura 67: Diagrama de Cortante (YZ) pórticos en concreto de carga, 2do edificio cargado posteriormente – método elementos finitos

En la Figura 62 a la Figura 67 se muestran los cortantes determinados a lo largo de los ejes “xz” para los tres tipos de cimentaciones analizadas. Se observa un incremento en los cortantes negativos obtenidos para un edificio cuando se consideran dos edificios adyacentes con la aplicación de carga simultánea, y los esfuerzos cortantes aumentan de manera significativa para el caso en que el edificio 2 es cargado posteriormente. Los incrementos en los cortantes positivos son menores para el escenario en que se tienen las estructuras adyacentes con respecto a la consideración de una sola edificación. Para el cortante “yz”, se observa un incremento en los esfuerzos cortantes obtenidos para un edificio con respecto a los esfuerzos cortantes determinados para los edificios adyacentes con la aplicación de carga simultánea, y los esfuerzos cortantes aumentan en forma significativa para el caso en el cual el edificio 2 es cargado posteriormente.

El resumen de los resultados de las modelaciones se encuentra en el numeral 5.4.2.4. “Comparativo de resultados de las modelaciones” del presente documento.

5.4.2.2. Modelación cimentación de edificio en muros de carga

A continuación, se muestran los resultados del modelo matemático de la cimentación para el edificio de Muros de carga.

5.4.2.2.1. Asentamientos – Método de elementos finitos

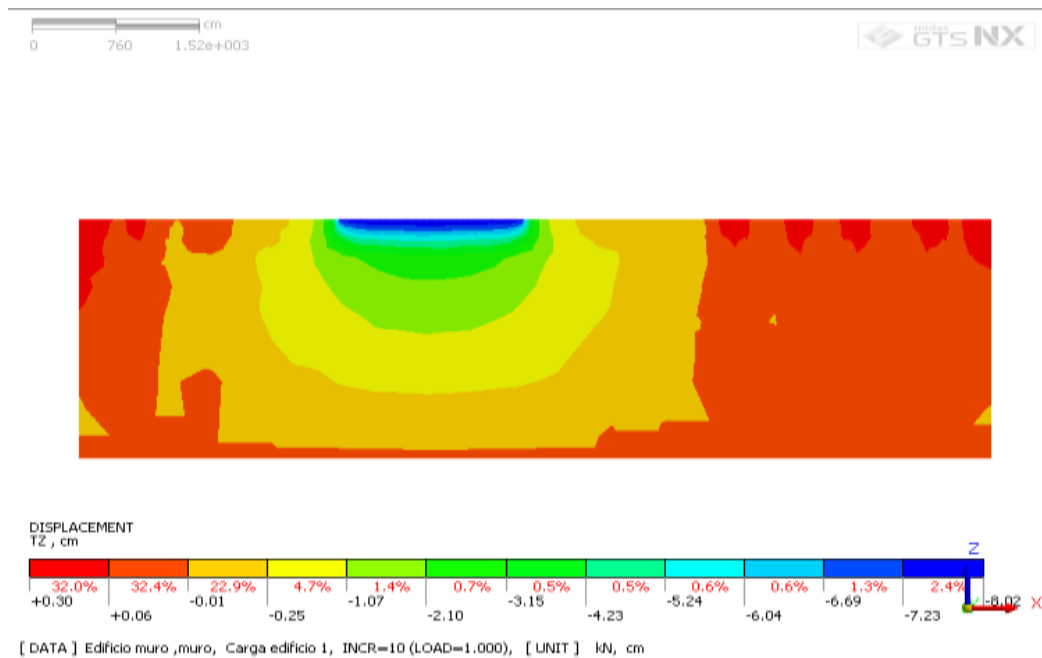


Figura 68: Asentamientos totales edificio 1 - Modelo elementos finitos

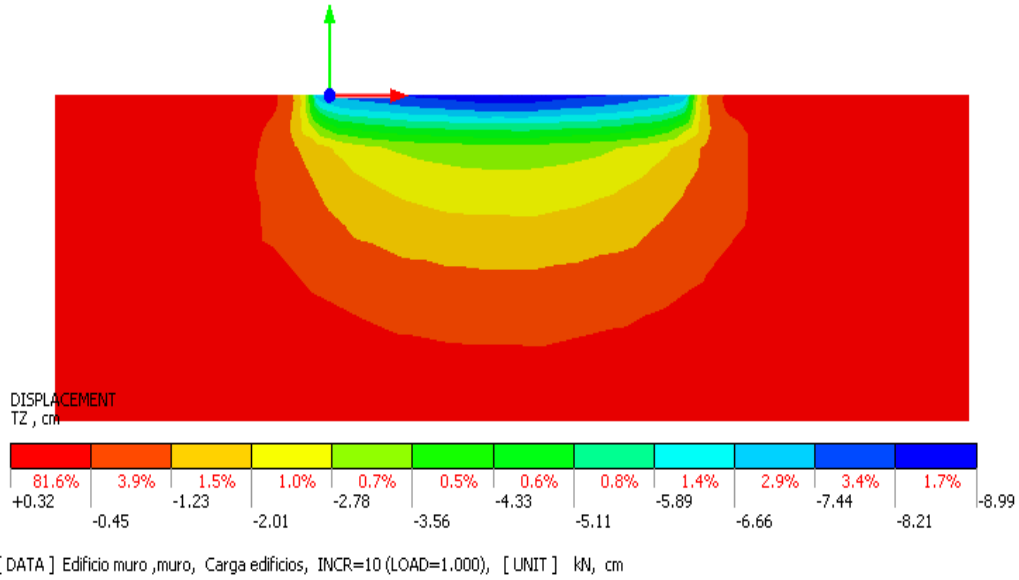


Figura 69: Asentamientos totales edificio 1 + edificio 2 carga simultánea - Modelo elementos finitos

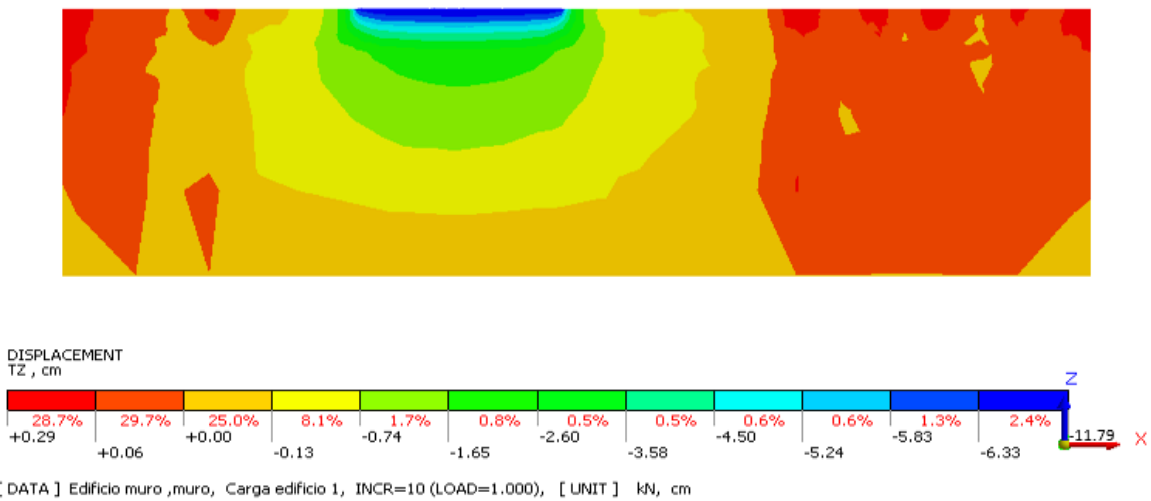


Figura 70: Asentamientos totales edificio 1 + edificio 2 carga posterior - Modelo elementos finitos

En la Figura 68, la Figura 69 y la Figura 70 se muestran los asentamientos totales para los tres tipos de cimentaciones analizadas. A continuación, se listan las magnitudes de los asentamientos totales obtenidos para las tres condiciones de carga analizadas.:

| | Una edificación | Dos edificios adyacentes Carga simultánea | Dos edificios adyacentes Edificio 2 cargado después de edificio 1 |
|---------------------|-----------------|--|--|
| Asentamiento total: | -8.02 cm | -8.99 cm | -11.79 cm |

En los tres casos, la magnitud de los asentamientos son inferiores a lo estipulado por la NSR-10, literal H.4.9.2 “Límites de asentamientos totales”, en donde se especifican asentamientos totales máximos permisibles calculado a 20 años, para construcciones aisladas de 30cm y para construcciones medianeras de 15cm (Reglamento Colombiano de Construcción Sismo Resistente NSR-10, 2010). Para el presente caso aplica el segundo criterio, Por otra parte, se tiene un aumento en el valor del asentamiento al pasar de una sola edificación a dos adyacentes.

5.4.2.2.2. Esfuerzos sobre el suelo – Método de elementos finitos

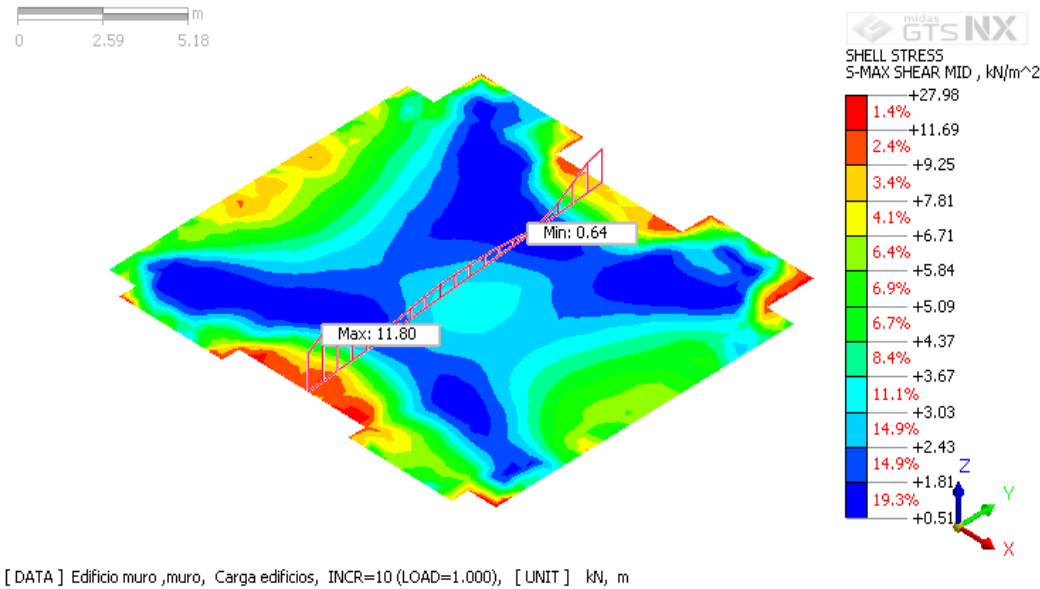
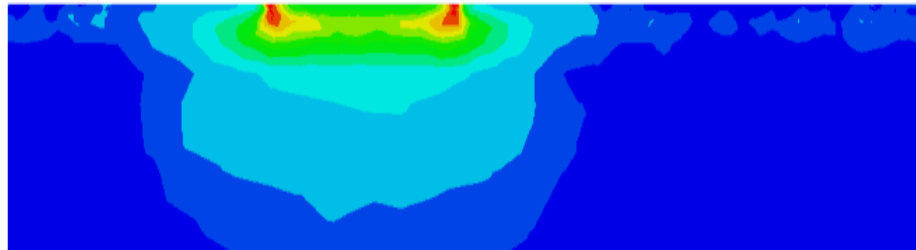
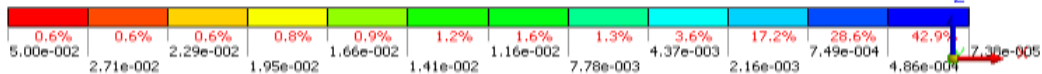


Figura 71: Esfuerzo cortante en losa para estructura muro de carga – Metodo elementos finitos

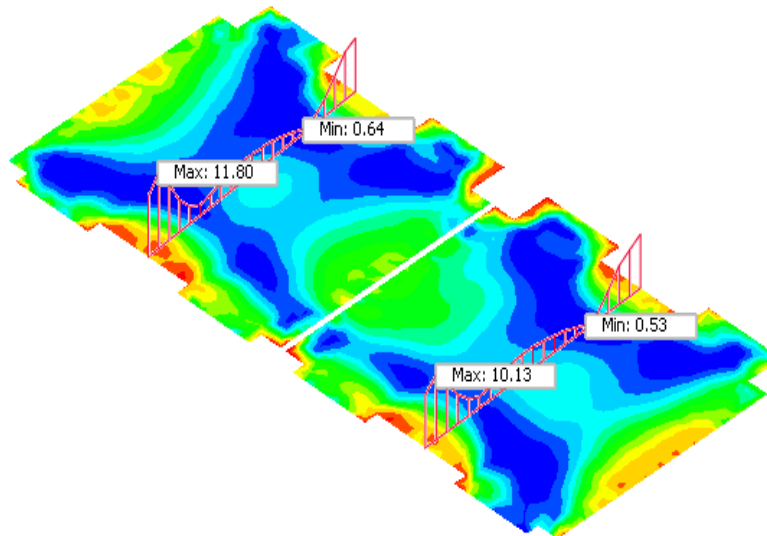


SOLID STRAIN
E-MAX SHEAR , None

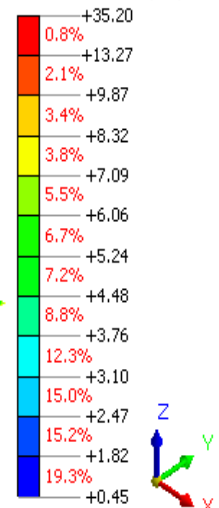


[DATA] Edificio muro ,muro, Carga edificio 1, INCR=10 (LOAD=1.000), [UNIT] kN, cm

Figura 72: Deformación cortante máxima en el suelo en porcentaje por metro para estructura muro de carga – Metodo elementos finitos



SHELL STRESS
S-MAX SHEAR MID , kN/m²



[DATA] Edificio muro ,muro, Carga edificios, INCR=10 (LOAD=1.000), [UNIT] kN, m

Figura 73: Esfuerzo cortante en losa para estructura muros de carga, carga simultanea – Metodo elementos finitos

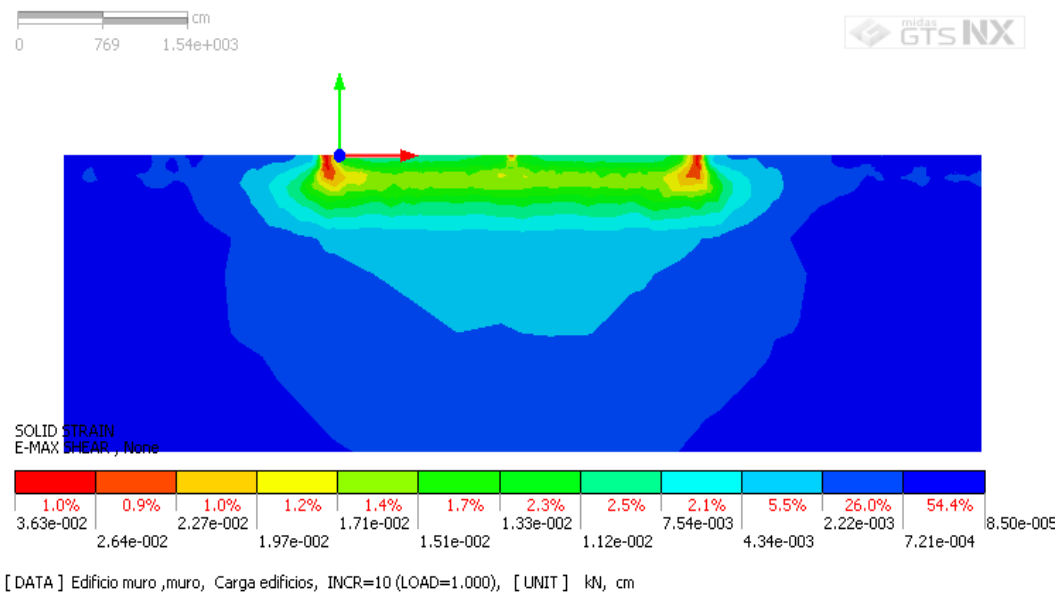


Figura 74: Deformación cortante máxima en el suelo en porcentaje por metro para estructura muros de carga, carga simultanea – Metodo elementos finitos

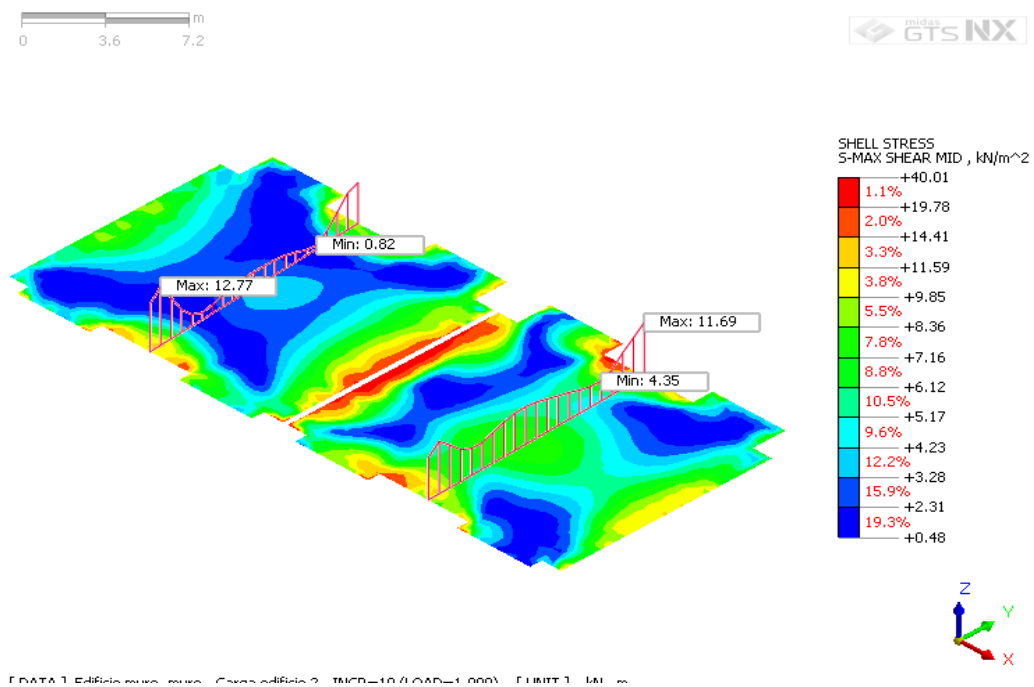


Figura 75: Esfuerzo cortante en losa para estructura muros de carga, edificio 2 cargado posterior – Metodo elementos finitos

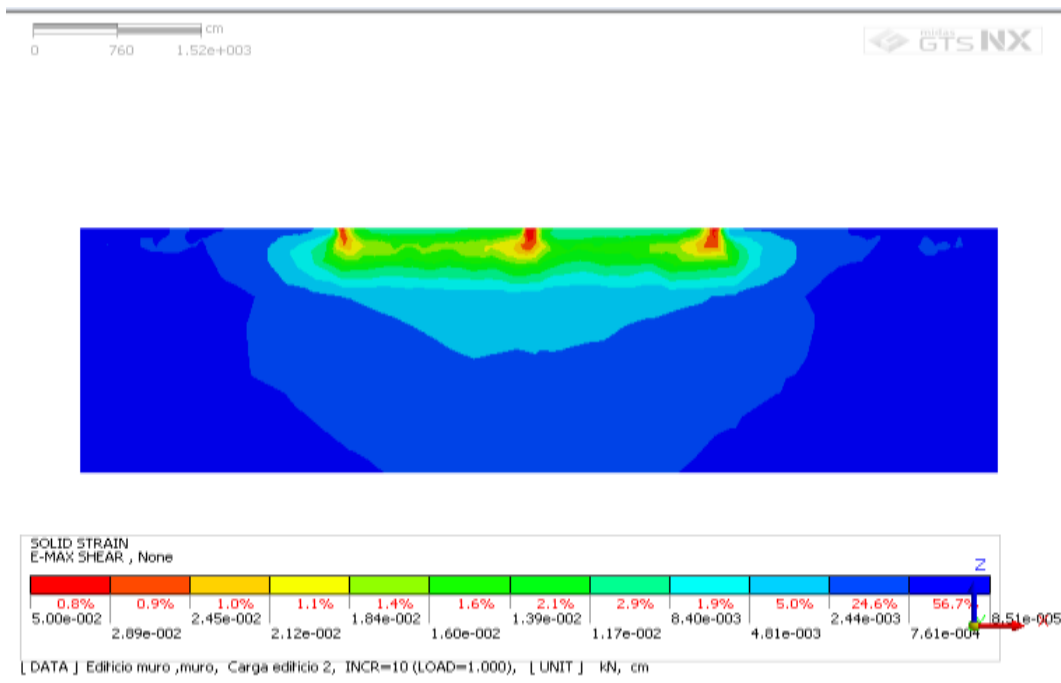


Figura 76: Deformación cortante máxima en el suelo en porcentaje por metro para estructura muros de carga, edificio 2 cargado posterior – Metodo elementos finitos

En la Figura 71, Figura 73 y Figura 75 se muestran las magnitudes de los esfuerzos cortantes para los tres sistemas estructurales analizados mediante elementos finitos, son menores para una edificación y aumentan considerablemente ante la acción de dos estructuras adyacentes. El esfuerzo máximo en el primer caso es de 27.98 kN/m², ante la acción simultánea de edificaciones aumenta a 35.20 kN/m², y en el caso de ser cargado de manera posterior el edificio 2 la magnitud del esfuerzo es de 40.01 kN/m².

En la Figura 72, Figura 74 y Figura 76 se muestran las magnitudes de las deformaciones cortantes en porcentaje por metro. La deformación máxima en el primer caso, considerando una sola estructura, es de 5.00%, presentando una disminución en la zona de colindancia al considerar la estructura adyacente cargada de manera simultánea en 3.63%, y con respecto a la tercera condición, la cual evalúa la estructura adyacente cargada de manera posterior, se presenta un aumento, siendo la deformación de 5.00%.

5.4.2.2.3. Momentos y cortantes en la cimentación – Método de elementos finitos

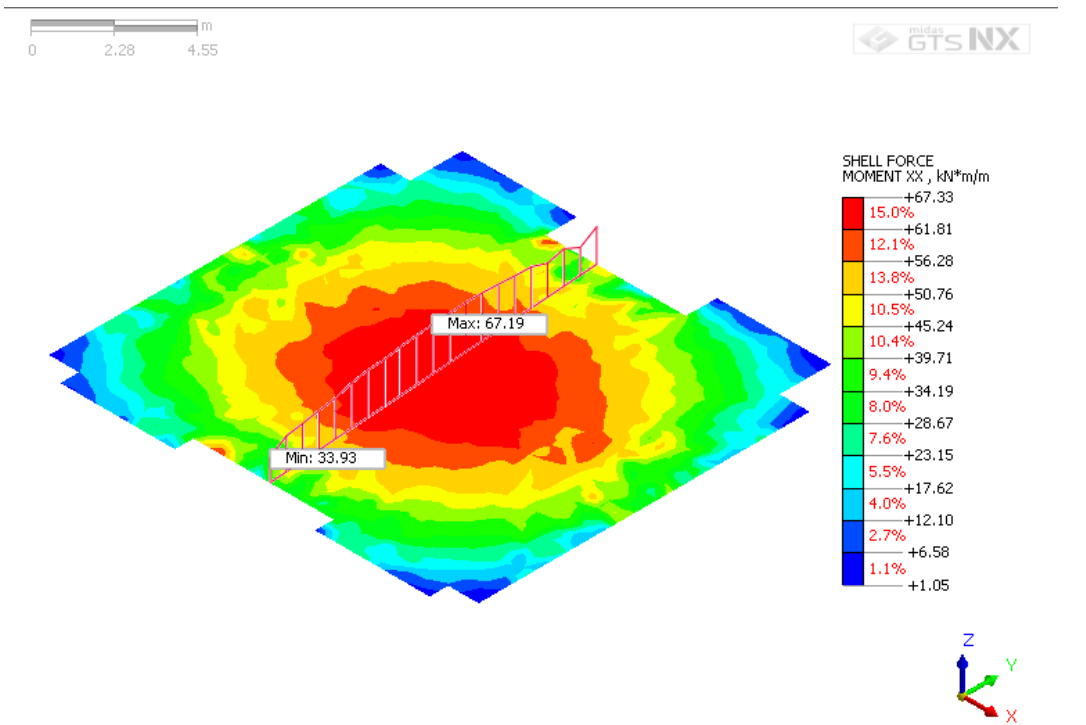


Figura 77: Diagrama de momentos (XX)– método elementos finitos

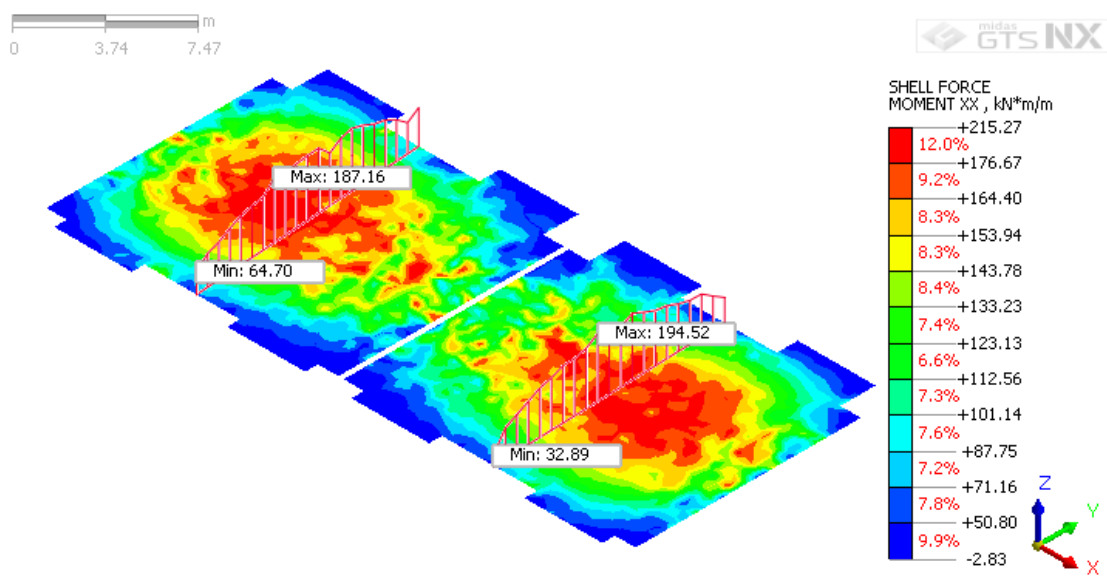


Figura 78: Diagrama de momentos (XX) accion simultanea de edificaciones adyacentes– método elementos finitos

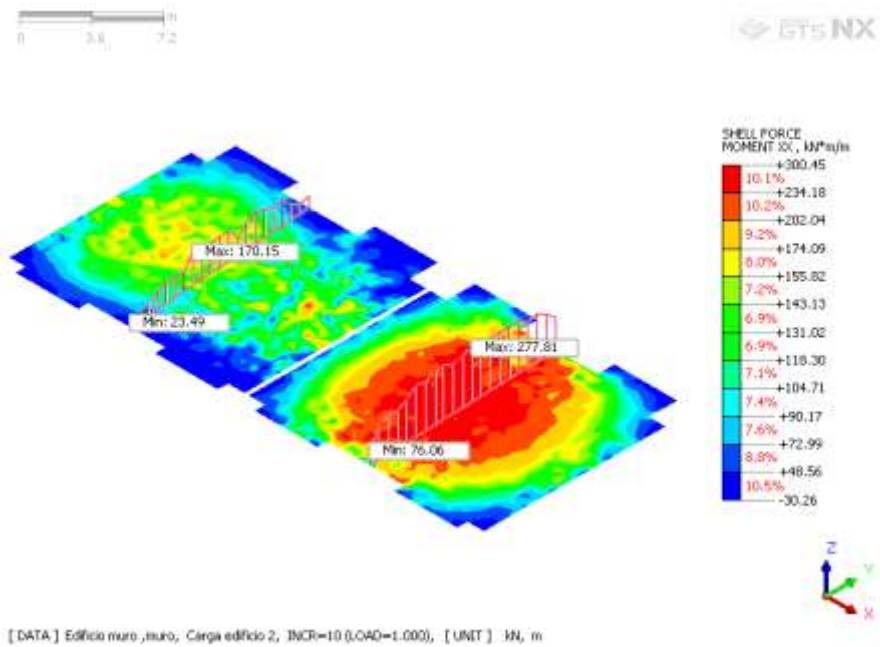


Figura 79: Diagrama de momentos (XX) carga 2 posterior de edificaciones adyacentes – método elementos finitos

En la Figura 77, la Figura 78 y la Figura 79 se muestran los momentos determinados a lo largo del eje x para los tres tipos de cimentaciones analizadas. Comparando con los momentos determinados para una sola edificación, ante la acción simultánea de dos edificaciones, ocurre un incremento de 150.94 kN*m, y un incremento de 233.12 kN*m, para la condición en la que se carga el segundo edificio posteriormente.

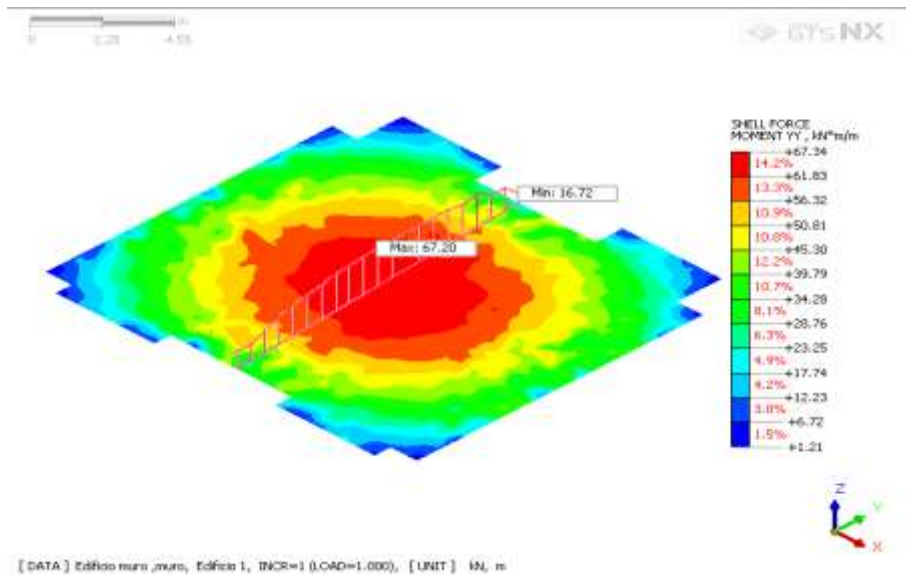


Figura 80: Diagrama de momentos (YY) – método elementos finitos

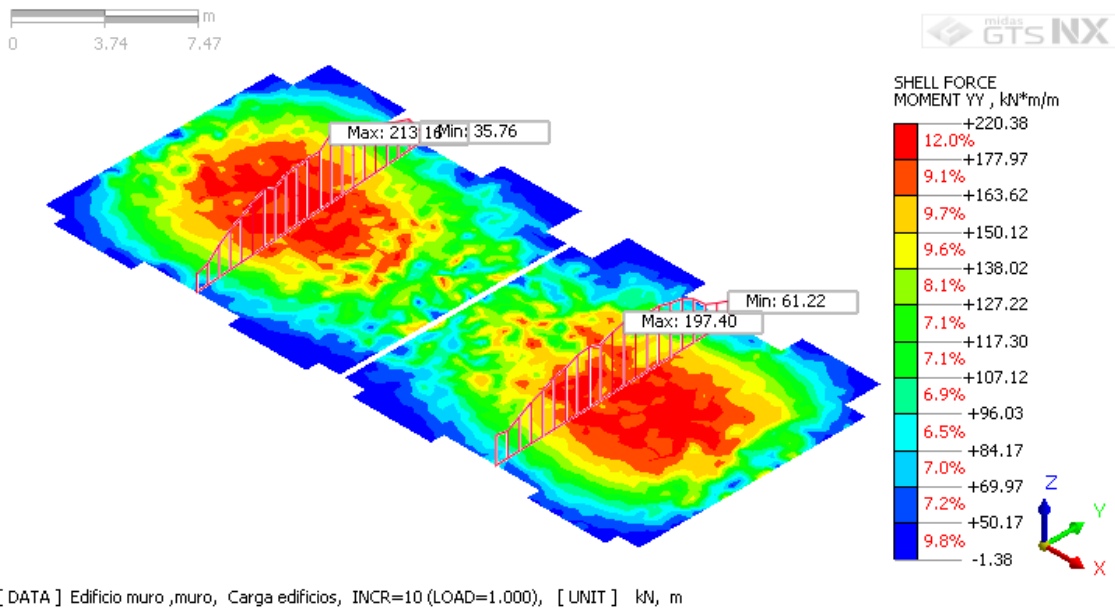


Figura 81: Diagrama de momentos (YY) accion simultanea de edificaciones adyacentes– método elementos finitos

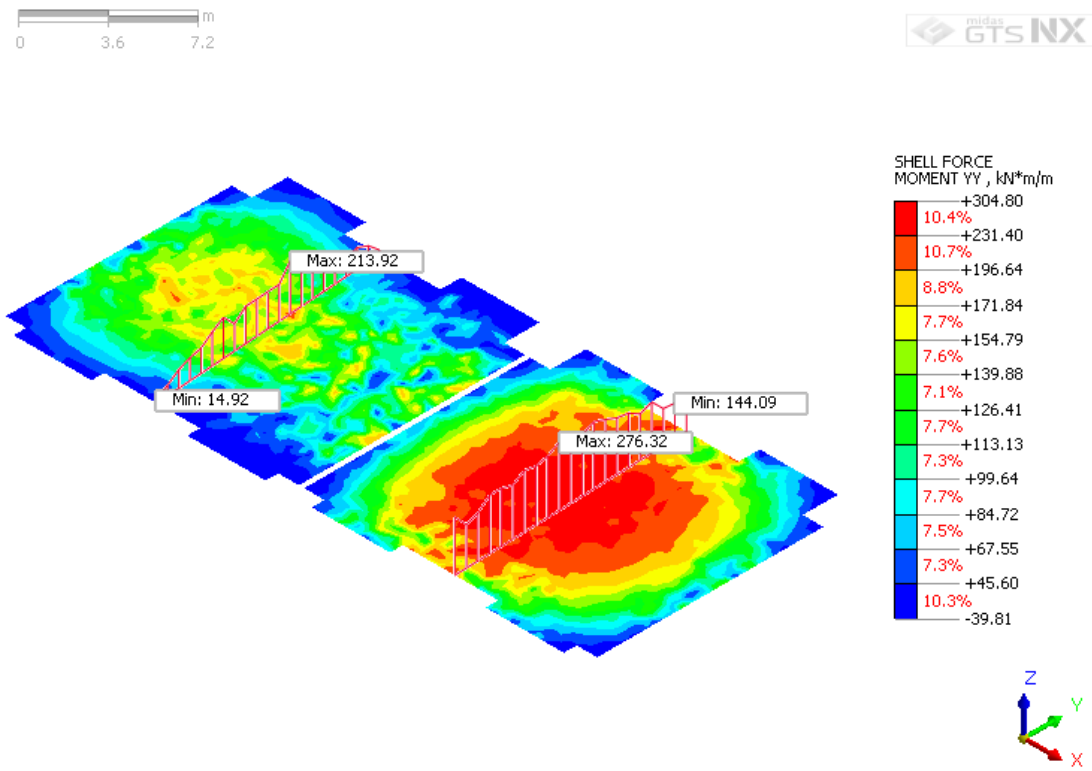


Figura 82: Diagrama de momentos (YY) edificio 2 cargado posterior de edificaciones adyacentes– método elementos finitos

De acuerdo con los resultados de momentos para los ejes y (Ver Figura 80, Figura 81 y Figura 82), comparando con los resultados obtenidos para una sola edificación, ante la acción simultánea, ocurre un incremento de 150.94 kN*m y se obtiene un incremento de 233.12 kN*m para la condición en la que se carga el segundo edificio posteriormente.

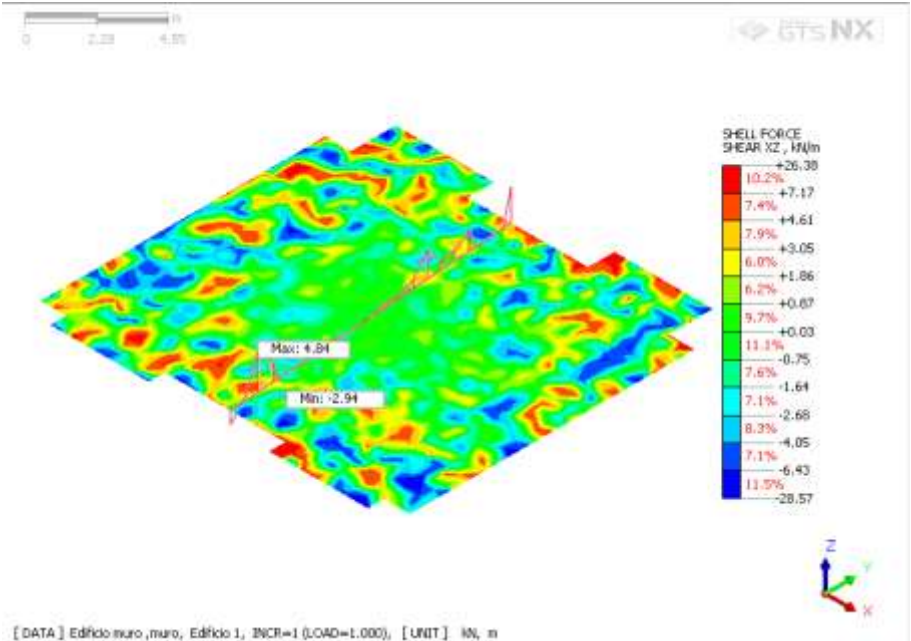


Figura 83: Diagrama de Cortante (XZ) un edificio muros de carga – método elementos finitos

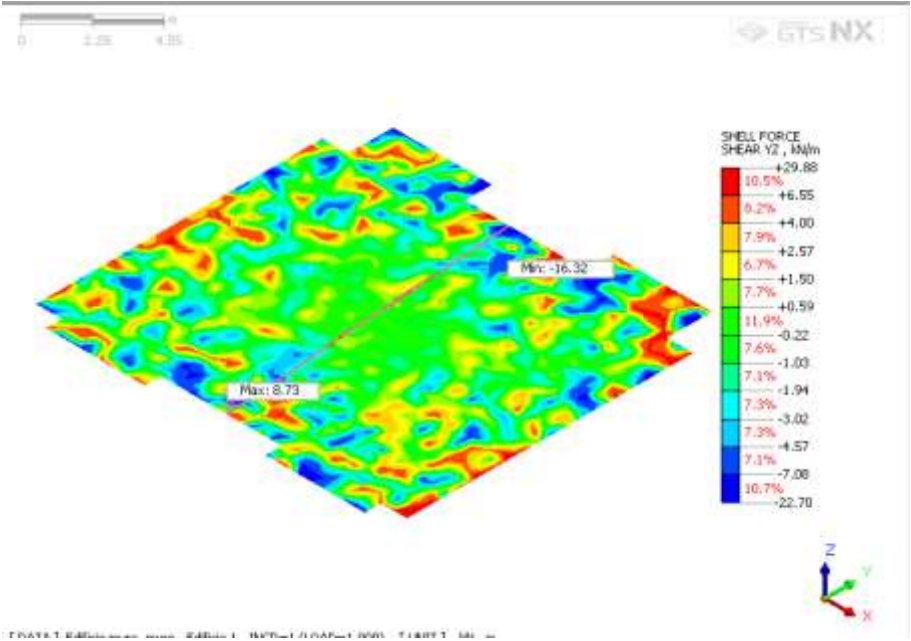


Figura 84: Diagrama de Cortante (YZ) un edificio muros de carga – método elementos finitos

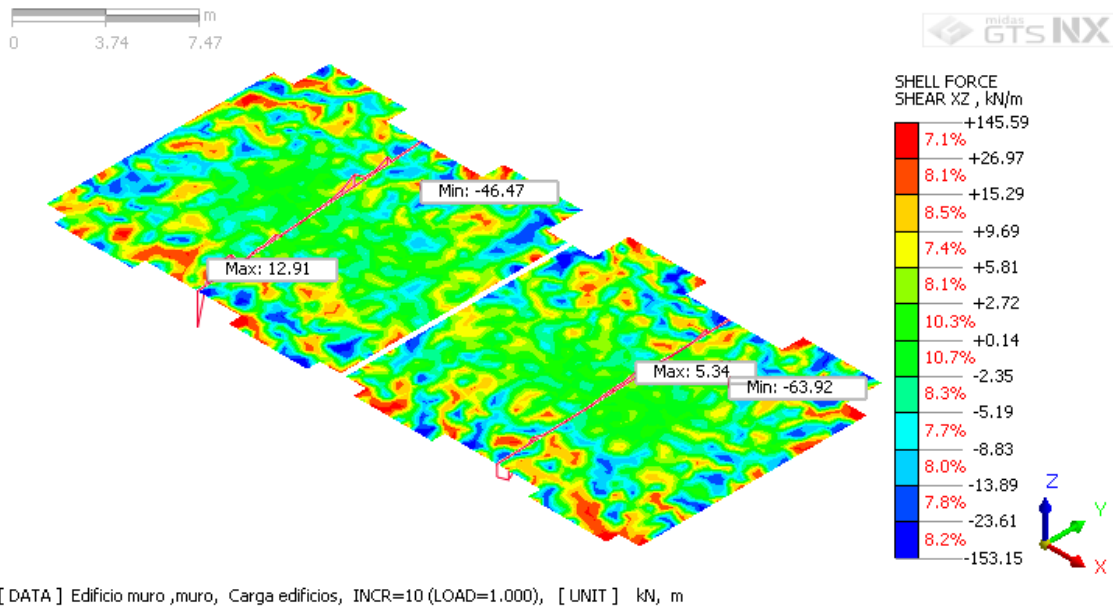


Figura 85: Diagrama de Cortante (XZ) muros de carga de carga simultánea – método elementos finitos

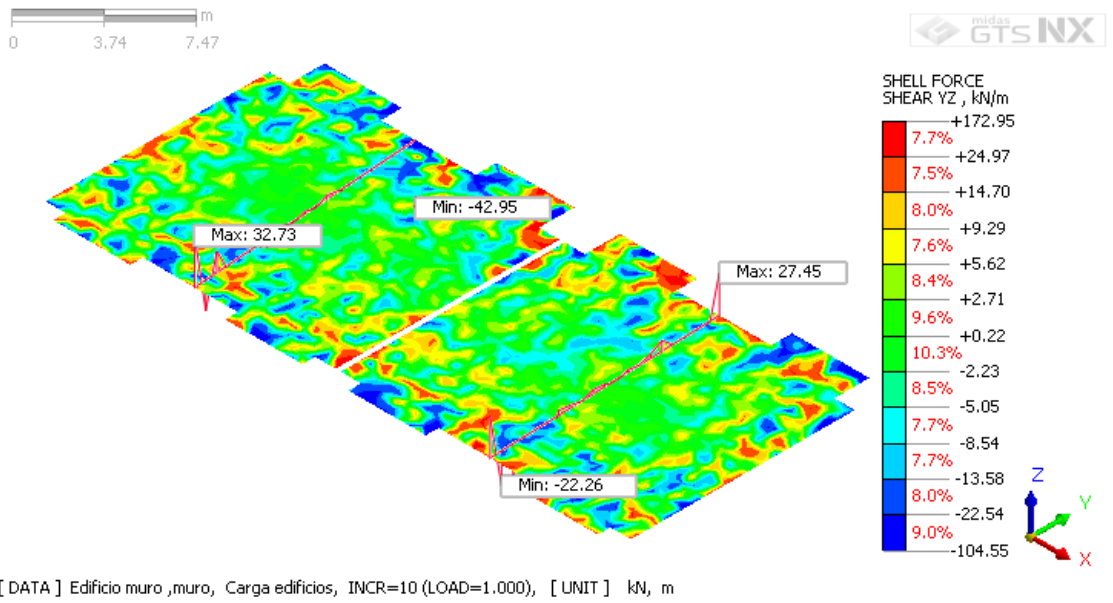


Figura 86: Diagrama de Cortante (YZ) muros de carga de carga simultánea – método elementos finitos

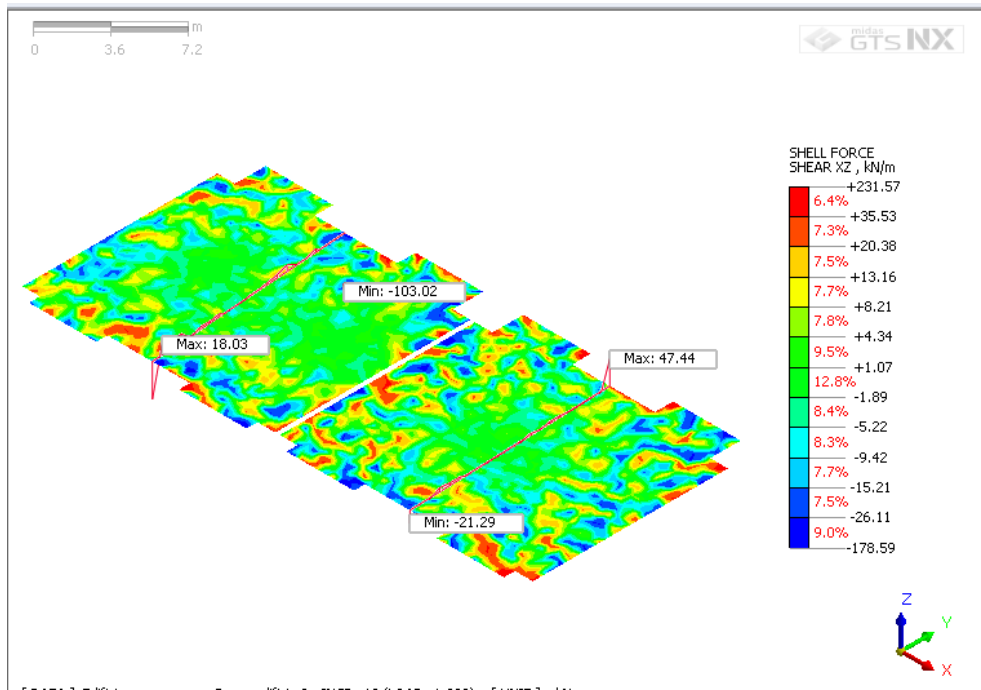


Figura 87: Diagrama de Cortante (XZ) muros de carga, 2do edificio cargado posteriormente – método elementos finitos

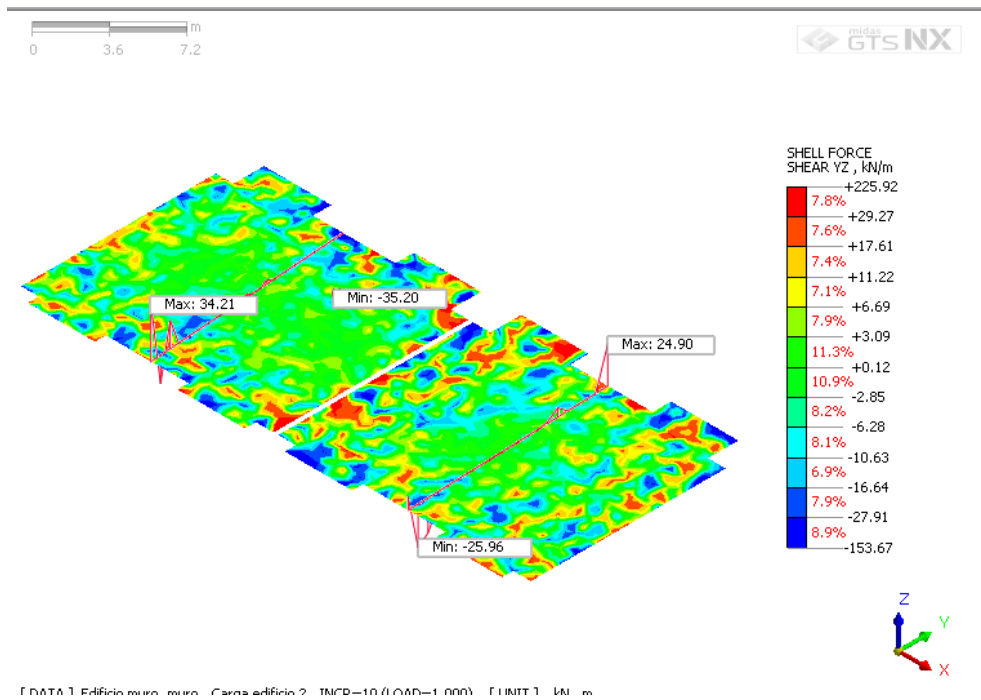


Figura 88: Diagrama de Cortante (YZ) muros de carga, 2do edificio cargado posteriormente – método elementos finitos

En la Figura 83 a la Figura 88 se muestran los cortantes determinados a lo largo de los ejes “xz” para los tres tipos de cimentaciones analizadas. Se observa un incremento en los cortantes negativos obtenidos para un edificio cuando se consideran dos edificios adyacentes con la aplicación de carga simultánea, y los esfuerzos cortantes aumentan de manera significativa para el caso en que el edificio 2 es cargado posteriormente. Los incrementos en los cortantes positivos son menores para el escenario en que se tienen las estructuras adyacentes con respecto a la consideración de una sola edificación. Para el cortante “yz”, se observa un incremento en los esfuerzos cortantes obtenidos para un edificio con respecto a los esfuerzos cortantes determinados para los edificios adyacentes con la aplicación de carga simultánea, y los esfuerzos cortantes aumentan en forma significativa para el caso en el cual el edificio 2 es cargado posteriormente.

El resumen de los resultados de las modelaciones se encuentra en el numeral 5.4.2.4. “Comparativo de resultados de las modelaciones” del presente documento.

5.4.2.3. Modelación cimentación de edificio en muros en mampostería estructural

A continuación, se describen los resultados del modelo matemático de la cimentación para el edificio de Muros en mampostería estructural

5.4.2.3.1. Asentamientos – Método de elementos finitos

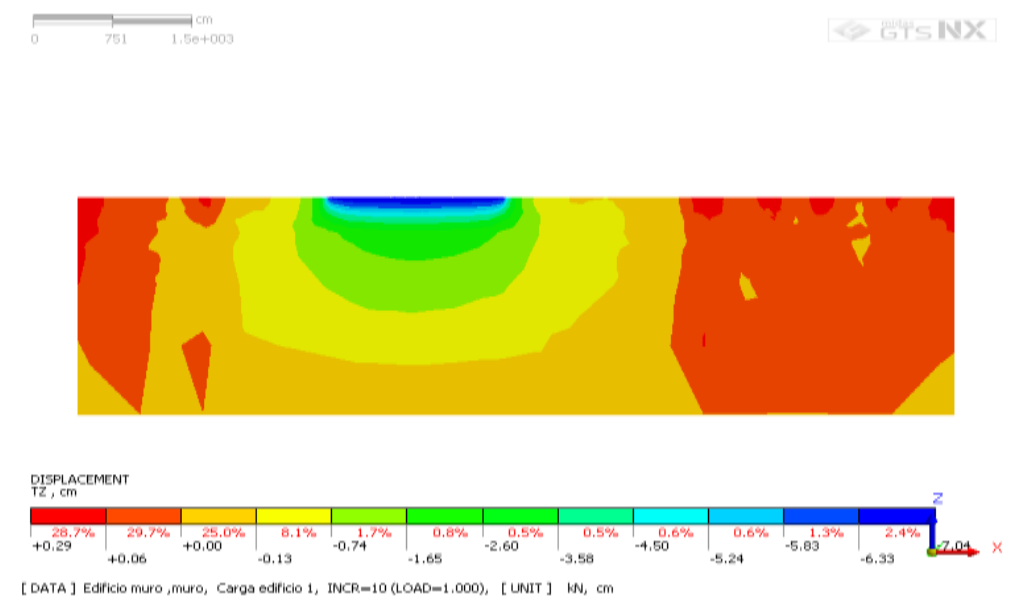


Figura 89: Asentamientos totales edificio 1 - Modelo elementos finitos

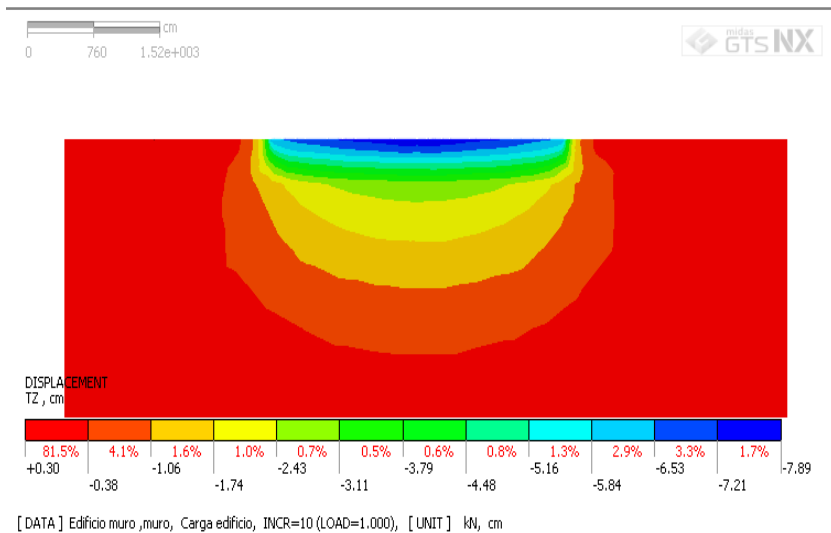


Figura 90: Asentamientos totales edificio 1 + edificio 2 carga simultanea - Modelo elementos finitos

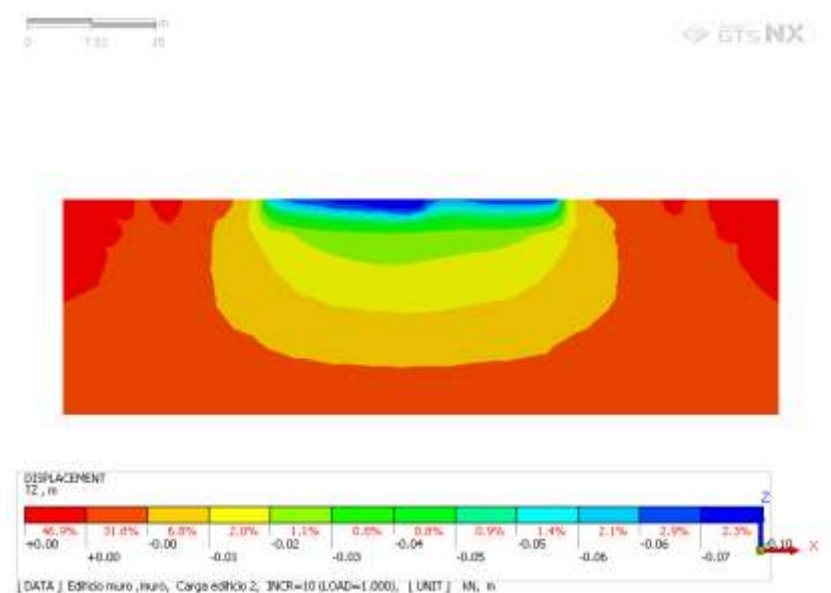


Figura 91: Asentamientos totales edificio 1 + edificio 2 carga posterior- Modelo elementos finitos

En la Figura 89, la Figura 90 y la Figura 91 se muestran los asentamientos totales para los tres tipos de cimentaciones analizadas. A continuación, se listan las magnitudes de los asentamientos totales obtenidos para las tres condiciones de carga analizadas.

| | Una edificación | Dos edificios adyacentes Carga simultánea | Dos edificios adyacentes Edificio 2 cargado después de edificio 1 |
|---------------------|-----------------|--|--|
| Asentamiento total: | -7.04 cm | -7.89 cm | -10 cm |

En los tres casos, la magnitud de los asentamientos son inferiores a lo estipulado por la NSR-10. literal H.4.9.2 “Límites de asentamientos totales”, en donde se especifican asentamientos totales máximos permisibles calculado a 20 años, para construcciones aisladas de 30cm y para construcciones medianeras de 15cm (Reglamento Colombiano de Construcción Sismo Resistente NSR-10, 2010). Para el presente caso aplica el segundo criterio, Por otra parte, se tiene un aumento en el valor del asentamiento al pasar de una sola edificación a dos adyacentes.

5.4.2.3.2. Esfuerzos sobre el suelo – Método de elementos finitos

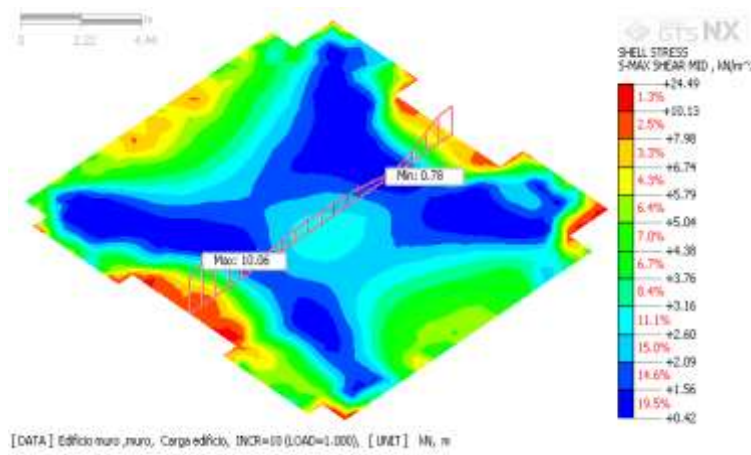


Figura 92: Esfuerzo cortante en losa para estructura muro en mampostería estructural – Método elementos finitos

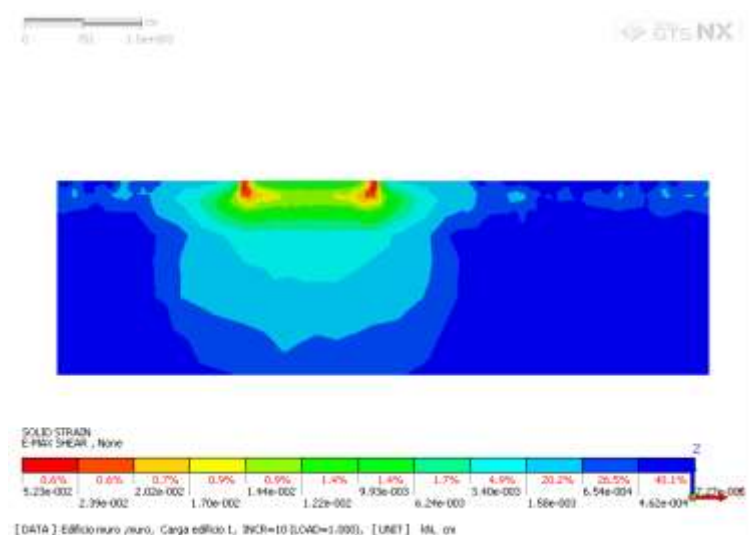


Figura 93: Deformación cortante máxima en el suelo en porcentaje por metro para estructura muro en mampostería estructural – Método elementos finitos

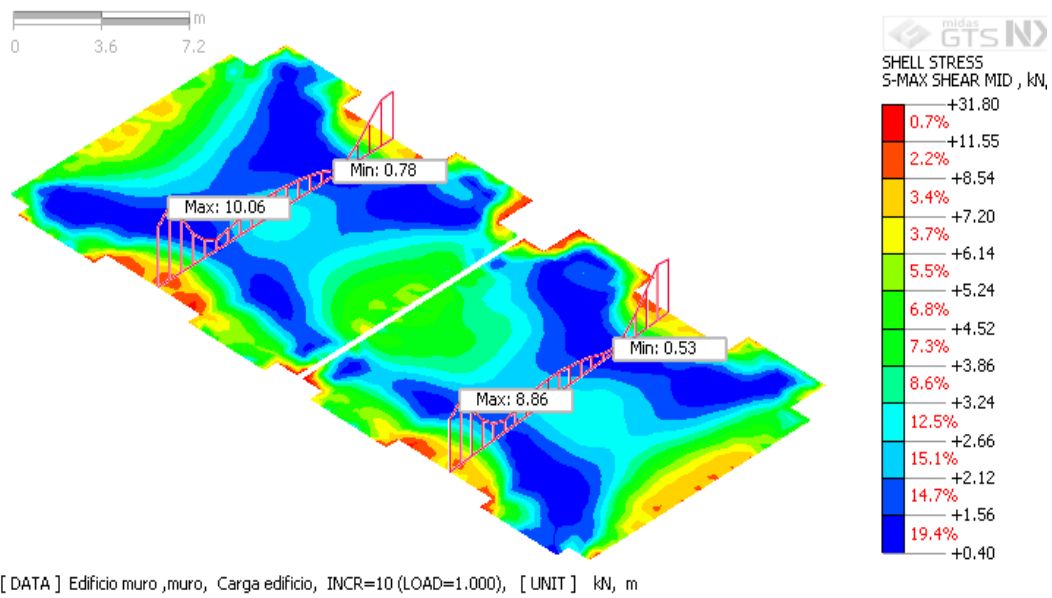


Figura 94: Esfuerzo cortante en losa para estructura muro en mampostería estructural, carga simultánea – Metodo elementos finitos

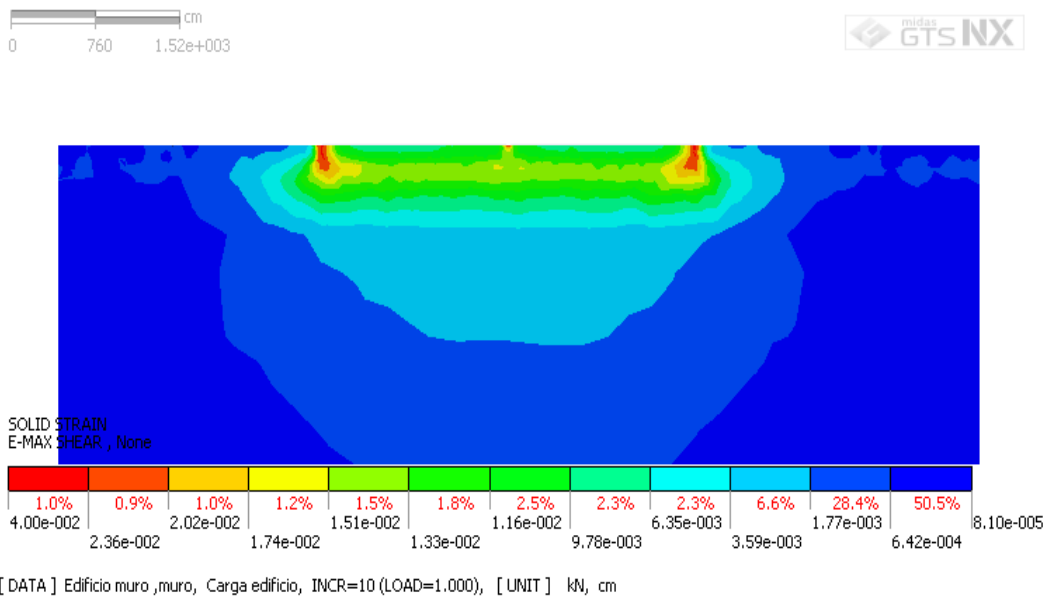


Figura 95: Deformación cortante máxima en el suelo en porcentaje por metro para estructura muro en mampostería estructural, carga simultánea– Metodo elementos finitos

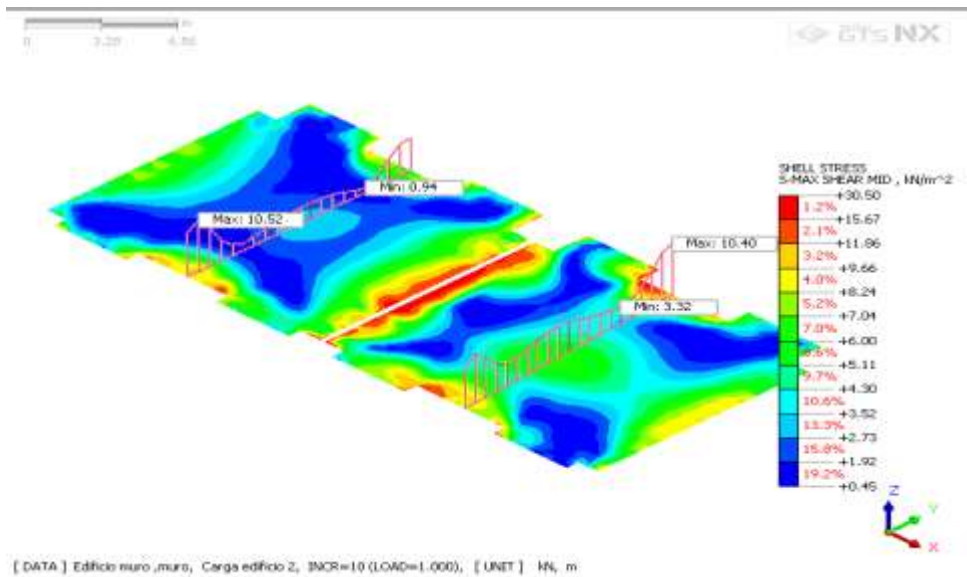


Figura 96: Esfuerzo cortante en losa para estructura muro en mampostería estructural, edificio 2 carga posterior – Metodo elementos finitos

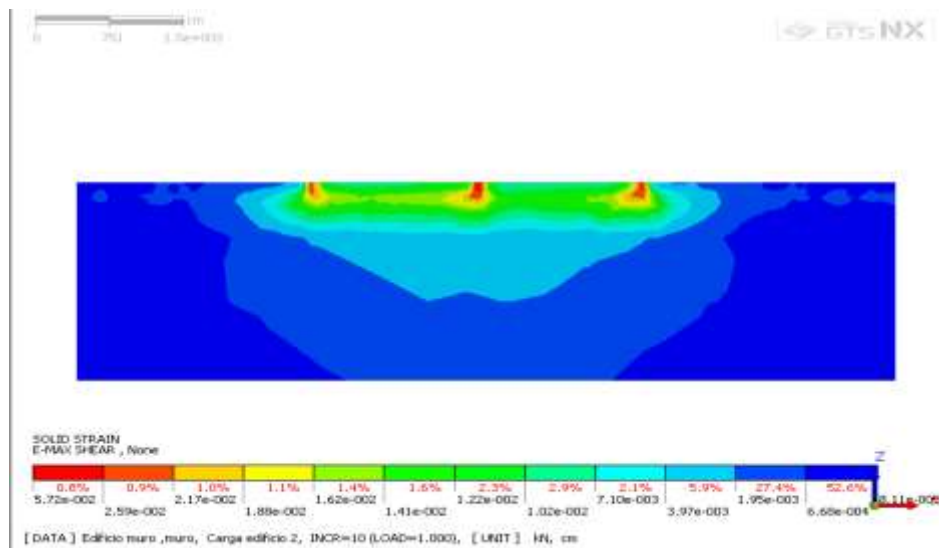


Figura 97: Deformación cortante máxima en el suelo en porcentaje por metro para estructura muro en mampostería estructural, edificio 2 carga posterior – Metodo elementos finitos

En la Figura 92, Figura 94 y Figura 96 se muestran las magnitudes de los esfuerzos cortantes para los tres sistemas estructurales analizados mediante elementos finitos, son menores para una edificación y aumentan considerablemente ante la acción de dos estructuras adyacentes. El esfuerzo máximo en el primer caso es de 24.49 kN /m², ante la acción simultánea de edificaciones aumenta a 31.80 kN /m², y en el caso de ser cargado de manera posterior el edificio 2 la magnitud del esfuerzo es de 30.50 kN/m².

En la Figura 93, Figura 95 y Figura 97 se muestran las magnitudes de las deformaciones cortantes en porcentaje por metro. La deformación máxima en el primer caso, considerando una sola estructura, es de 5.23%, presentando una disminución en la zona de colindancia al considerar la estructura adyacente cargada de manera simultánea en 4.00%, y con respecto a la tercera condición, la cual evalúa la estructura adyacente cargada de manera posterior, se presenta un aumento, siendo la deformación de 5.72%.

5.4.2.3.3. Momentos y cortantes en la cimentación – Método de elementos finitos

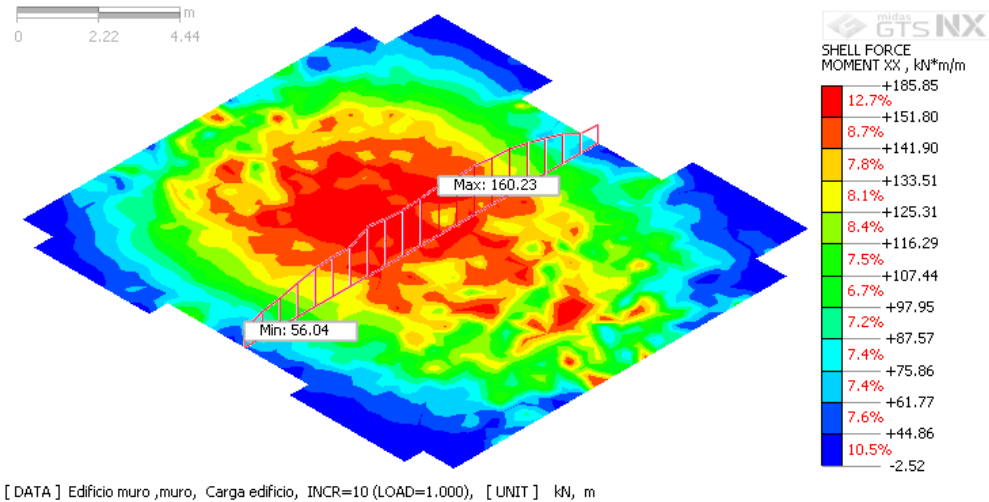


Figura 98: Diagrama de momentos (XX)– método elementos finitos

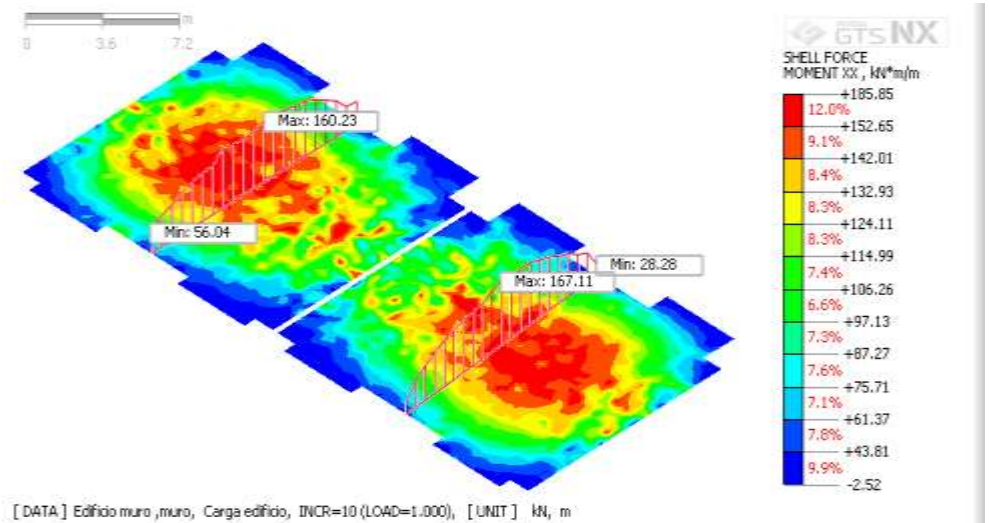


Figura 99: Diagrama de momentos (XX) accion simultanea de edificaciones adyacentes– método elementos finitos

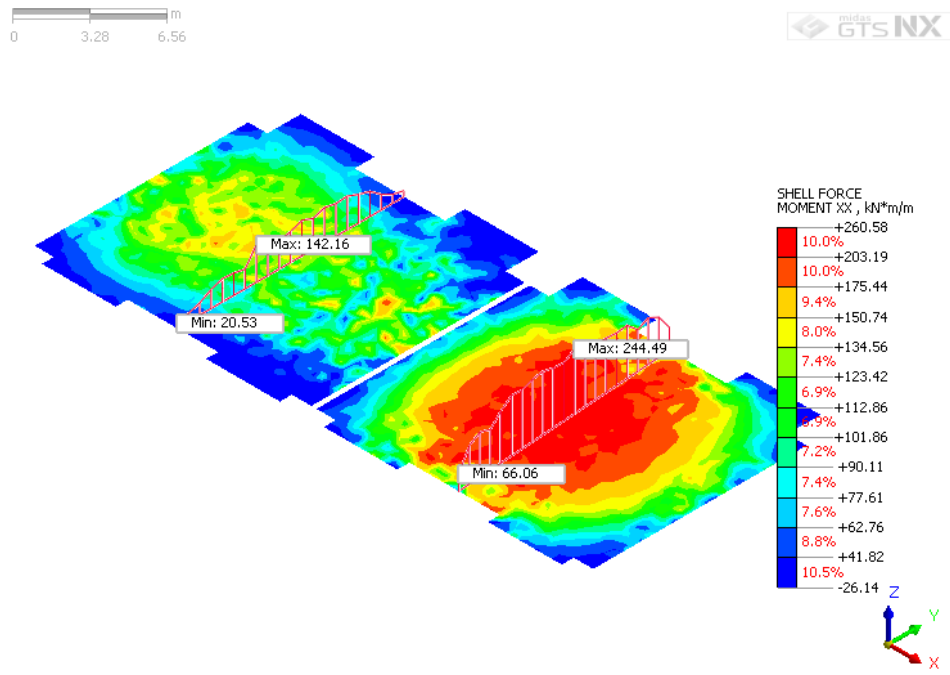


Figura 100: Diagrama de momentos (XX) carga 2 posterior de edificaciones adyacentes – método elementos finitos

En la Figura 98, la Figura 99 y la Figura 100 se muestran los momentos determinados a lo largo del eje x para los tres tipos de cimentaciones analizadas. Comparando con los momentos determinados para una sola edificación, ante la acción simultánea de dos edificaciones, el valor se mantiene en 185.85 kN*m. Sin embargo, se obtiene un incremento de 74.73 kN*m, para la condición en la que se carga el segundo edificio posteriormente.

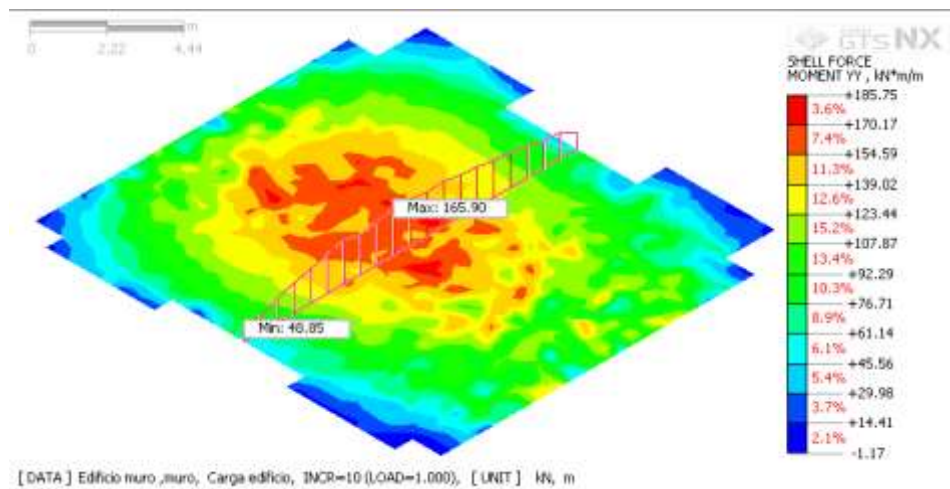


Figura 101: Diagrama de momentos (YY)– método elementos finitos

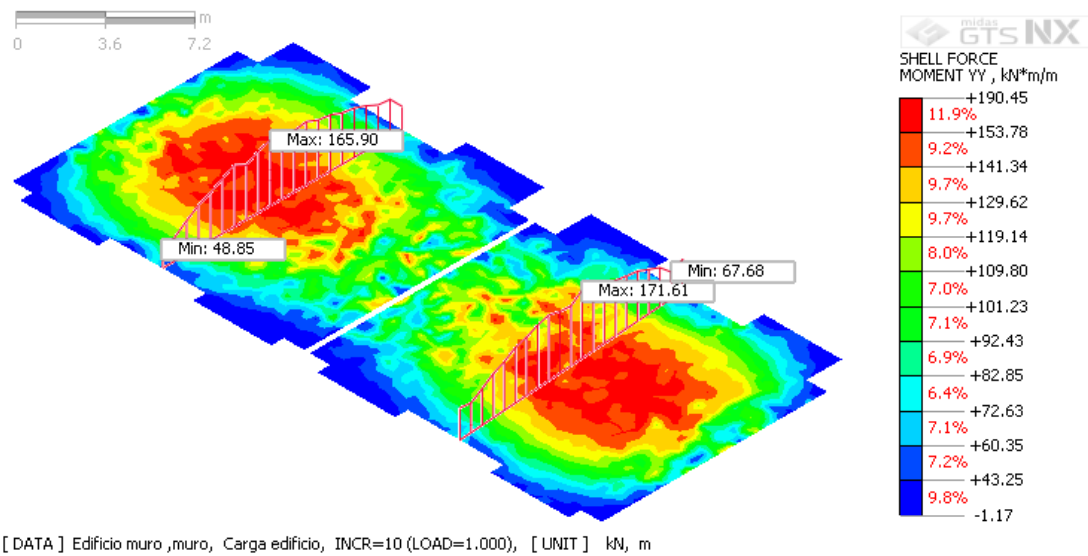


Figura 102: Diagrama de momentos (YY) accion simultanea de edificaciones adyacentes– método elementos finitos

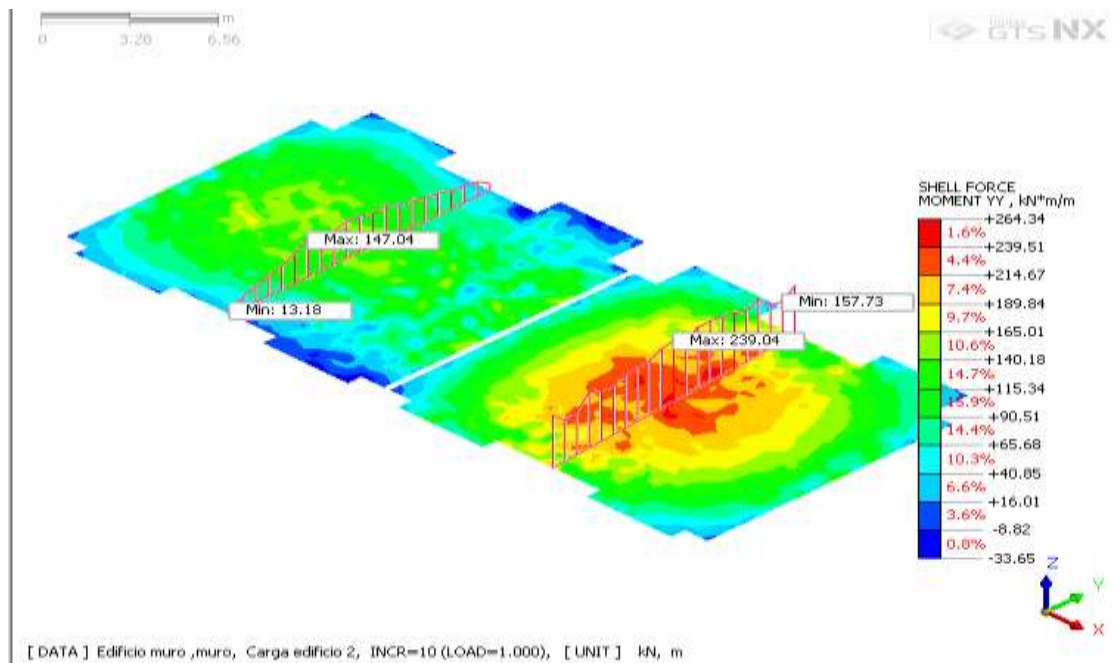
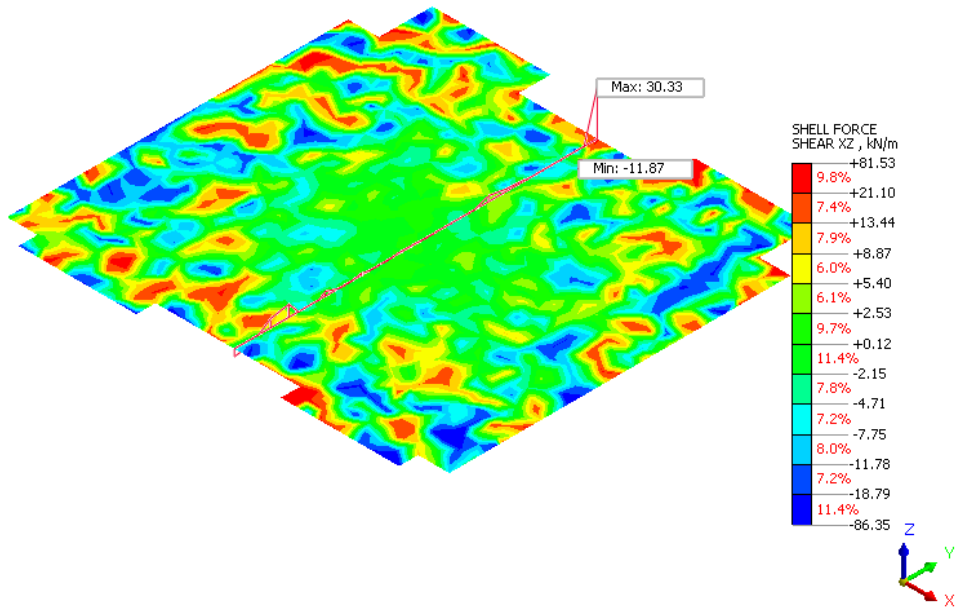


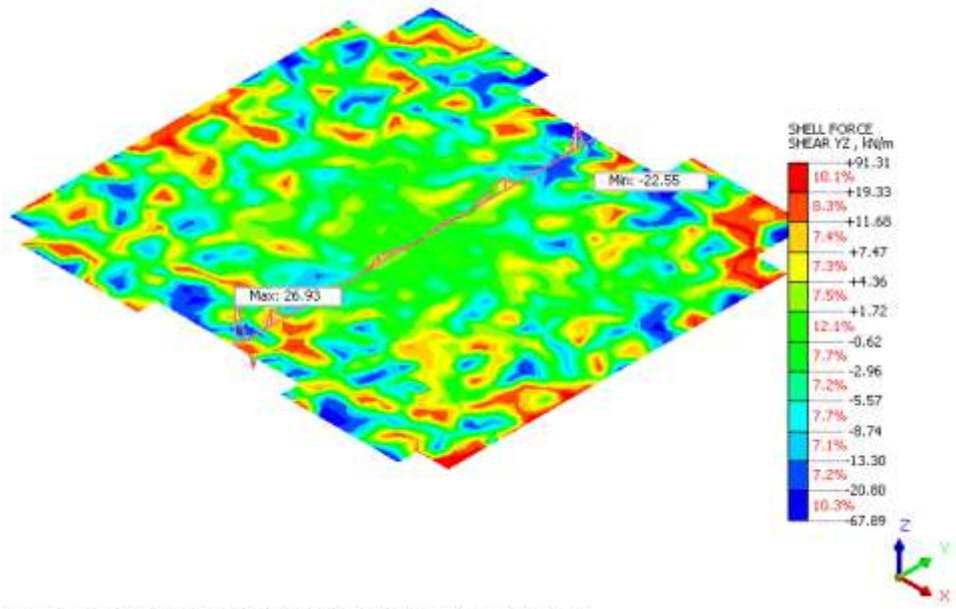
Figura 103: Diagrama de momentos (YY) edificio 2 cargado posterior de edificaciones adyacentes– método elementos finitos

De acuerdo con los resultados de momentos para los ejes y (Ver Figura 101, Figura 102 y Figura 103), comparando con los resultados obtenidos para una sola edificación, ante la acción simultánea, ocurre un incremento de 4.7 kN *m y se obtiene un incremento de 78.59 kN*m para la condición en la que se carga el segundo edificio posteriormente.



[DATA] Edificio muro ,muro, Carga edificio 1, INCR=10 (LOAD=1.000), [UNIT] kN, m

Figura 104: Diagrama de Cortante (XZ) un edificio muros en mampostería estructural – método elementos finitos



[DATA] Edificio muro ,muro, Carga edificio 1, INCR=10 (LOAD=1.000), [UNIT] kN, m

Figura 105: Diagrama de Cortante (YZ) un edificio muros en mampostería estructural – método elementos finitos

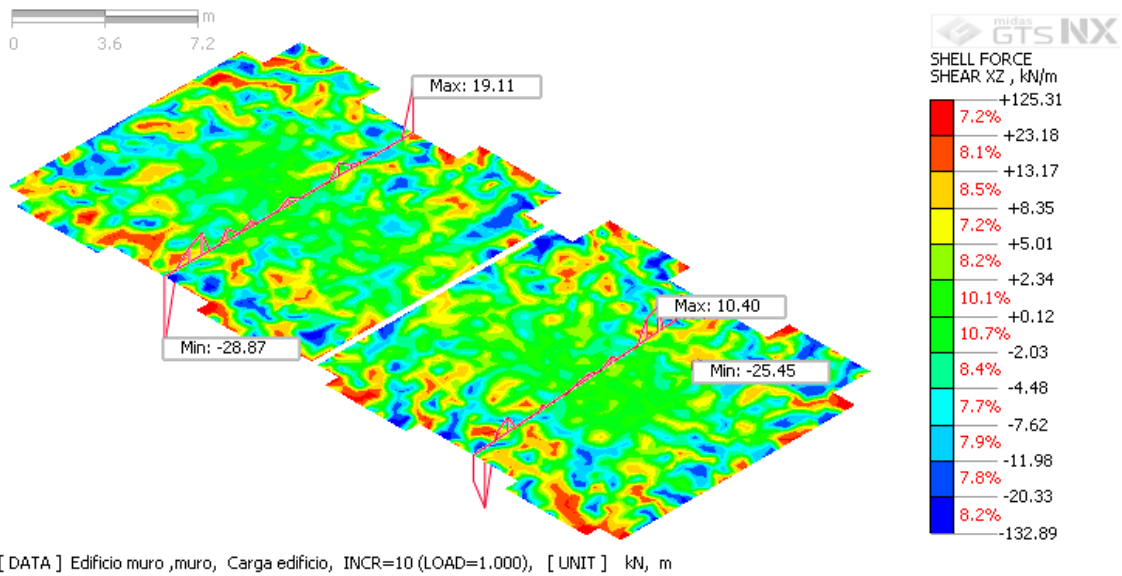


Figura 106: Diagrama de Cortante (XZ) muros en mampostería estructural de carga simultánea – método elementos finitos

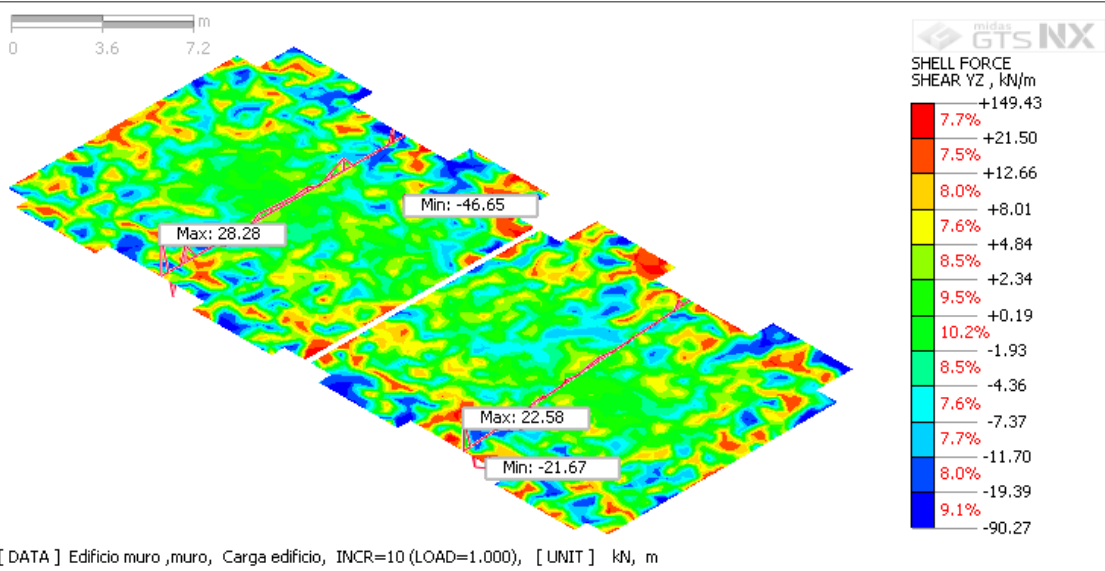


Figura 107: Diagrama de Cortante (YZ) muros en mampostería estructural de carga simultánea – método elementos finitos

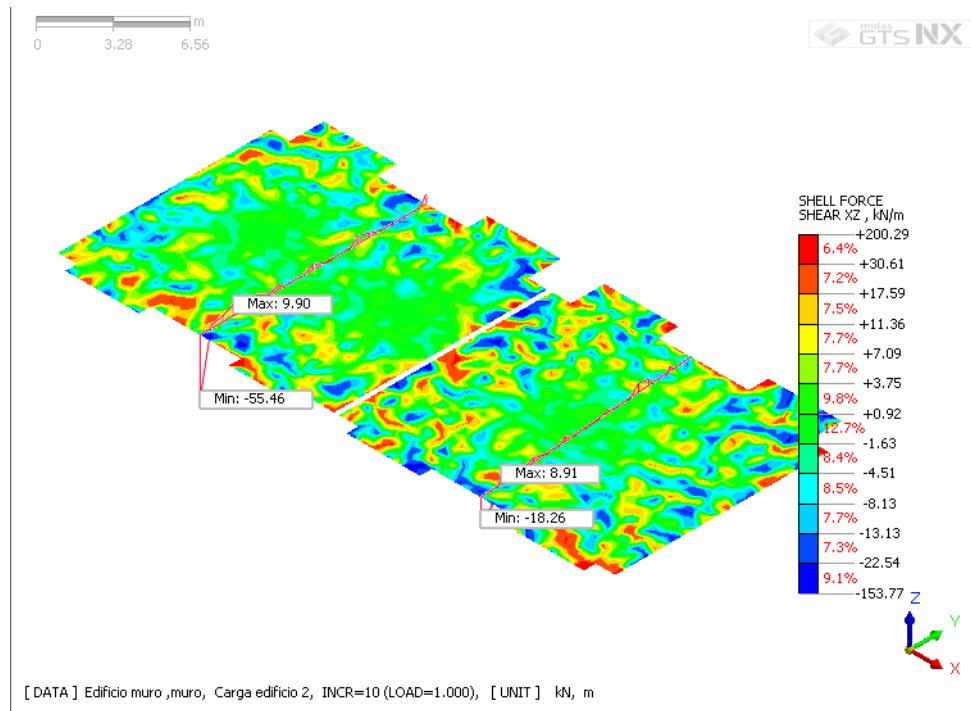


Figura 108: Diagrama de Cortante (XZ) muros de mampostería estructural, 2do edificio cargado posteriormente – método elementos finitos

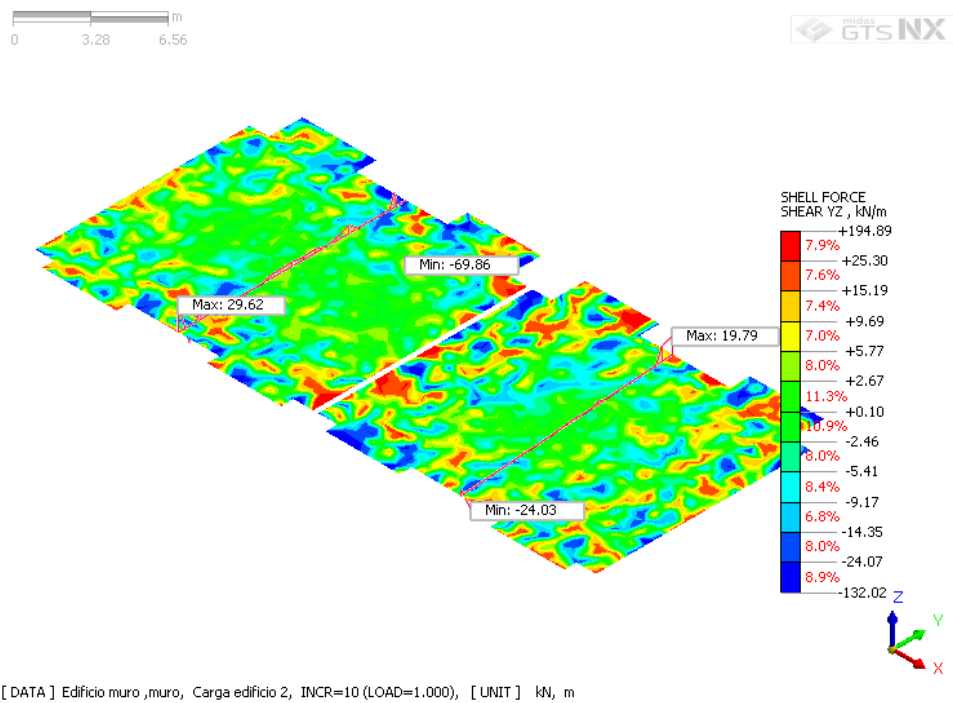


Figura 109: Diagrama de Cortante (YZ) muros en mampostería estructural, 2do edificio cargado posteriormente – método elementos finitos

En la Figura 104 a la Figura 109 se muestran los cortantes determinados a lo largo de los ejes “xz” para los tres tipos de cimentaciones analizadas. Se observa un incremento en los cortantes negativos obtenidos para un edificio cuando se consideran dos edificios adyacentes con la aplicación de carga simultánea, y los esfuerzos cortantes aumentan de manera significativa para el caso en que el edificio 2 es cargado posteriormente. Los incrementos en los cortantes positivos son menores para el escenario en que se tienen las estructuras adyacentes con respecto a la consideración de una sola edificación. Para el cortante “yz”, se observa un incremento en los esfuerzos cortantes obtenidos para un edificio con respecto a los esfuerzos cortantes determinados para los edificios adyacentes con la aplicación de carga simultánea, y los esfuerzos cortantes aumentan en forma significativa para el caso en el cual el edificio 2 es cargado posteriormente.

El resumen de los resultados de las modelaciones se encuentra en el numeral 5.4.2.4. “Comparativo de resultados de las modelaciones” del presente documento.

5.4.2.4. Comparativo de resultados de las modelaciones

5.4.2.4.1. Comparativo de asentamientos

De acuerdo con los resultados de los análisis presentados en la sección 5.4.1 y 5.4.2, se muestra a continuación la comparación.

5.4.2.4.2. Asentamientos

Tabla 39: Resultados comparativo asentamientos

| Asentamientos Totales (cm) | | | Asentamientos diferenciales (cm) | | |
|--|-------------|----------------------|--------------------------------------|--------------------------------------|-------------|
| Modelo elementos finitos | | | Modelo método de Winkler | | |
| | Un edificio | Edificios adyacentes | Edificios adyacentes | Mínimo | Máximo |
| Tipo de carga aplicada sobre el suelo | Un edificio | Simultánea | Construcción posterior 2 do edificio | | |
| Portico en concreto (cm) | -7.92 | -9.66 | -12.28 | Portico en concreto (cm) | -2.25 -3.36 |
| Muros de carga (cm) | -8.02 | -8.99 | -11.79 | Muros de carga (cm) | -2.40 -3.05 |
| Muros en mamposteria est (cm) | -7.04 | -7.89 | -10.00 | Muros en mamposteria est (cm) | -2.00 -2.90 |

No se puede establecer una comparación entre las modelaciones de elementos finitos y tipo Winkler, ya que, mediante el análisis de elementos finitos, se obtienen asentamientos totales evaluados por

cada edificación, y para el análisis de Winkler, se obtienen asentamientos diferenciales debido a que no considera la colindancia de estructuras.

En la Tabla 39, los resultados de modelo por elementos finitos, indican que los mayores asentamientos ocurren para el sistema estructural de muros de carga tanto para un edificio como para los edificios adyacentes, cargados de manera simultánea y los menores asentamientos para el sistema de mampostería estructural. En todos los casos de sistemas estructurales, el caso de dos edificaciones adyacentes produce asentamientos mayores que el escenario con una sola edificación.

Para asentamientos diferenciales, el modelo de Winkler, indica un asentamiento mayor para el edificio de sistema estructural de pórticos, seguido del edificio de muros de carga y el menor asentamiento máximo para muros de mampostería estructural.

5.4.2.4.3. Esfuerzos y deformaciones cortantes, esfuerzos actuantes.

Tabla 40: Resultados esfuerzo y deformación cortante por elementos finitos

| Esfuerzo y deformación cortante | | | | | | | | | |
|---|---------------|---------------|------------------|---------------------------------------|---------------|------------------|--|---------------|------------------|
| Modelo elementos finitos | | | | | | | | | |
| | Un edificio | | ϵ_v max | Edificios adyacentes carga simultanea | | ϵ_v max | Edificios adyacentes carga 2 posterior | | ϵ_v max |
| | σ -min | σ -max | (%) | σ -min | σ -max | (%) | σ -min | σ -max | (%) |
| Portico en concreto (kN/ m²) | 0.84 | 47.01 | 2.78% | 1.27 | 58.05 | 3.99% | 0.55 | 96.80 | 4.83% |
| Muros de carga (kN/ m²) | 0.51 | 27.98 | 5.00% | 0.45 | 35.20 | 3.63% | 0.48 | 40.01 | 5.00% |
| Muros en mamposteria est (kN/ m²) | 0.42 | 24.49 | 5.23% | 0.40 | 31.80 | 4.00% | 0.45 | 30.50 | 5.72% |

Como resultado de las modelaciones mediante elementos finitos mostrados en la Tabla 40, se determina que los muros en mampostería producen los menores valores de esfuerzo cortante seguido de muros de carga y luego mampostería estructural. Sin embargo, las deformaciones volumétricas unitarias son menores en la estructura de pórticos y aumentan para los escenarios de muros de carga y mampostería estructural.

Tabla 41: Resultado esfuerzos actuantes modelo tipo Winkler

| Esfuerzo | | |
|--|---------------|---------------|
| Modelo método de Winkler | | |
| | σ -min | σ -max |
| Portico en concreto (kN/ m ²) | 66.00 | 94.60 |
| Muros de carga (kN/ m ²) | 70.00 | 88.20 |
| Muros en mamposteria est (kN/ m ²) | 60.80 | 81.60 |

Para los resultados del modelo tipo Winkler, los esfuerzos actuantes mayores ocurren en la estructura de pórticos, seguido de muros de carga y el menor valor corresponde a muros de carga (Ver Tabla 41).

5.4.2.4.4. Cortantes y Momentos.

Tabla 42: Comparativo resultados de cortante para modelo de elementos finitos

| Modelo elementos finitos | | | | | | | | | | | | |
|---------------------------------|------------------|--------|---------------------------------------|--------|---|--------|------------------|--------|---------------------------------------|--------|---|--------|
| | Cortante xz (kN) | | | | | | Cortante yz (kN) | | | | | |
| | Un edificio | | Edificios adyacentes carga simultanea | | Edificios adyacentes carga edif 2 posterior | | Un edificio | | Edificios adyacentes carga simultanea | | Edificios adyacentes carga edif 2 posterior | |
| | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| Portico en concreto (kN/m) | -389.86 | 560.84 | -444.35 | 560.84 | -401.12 | 560.73 | -836.11 | 247.31 | -836.11 | 433.04 | -841.87 | 445.3 |
| Muros de carga (kN/m) | -28.57 | 26.38 | -153.15 | 145.59 | -178.59 | 231.57 | -22.7 | 29.88 | -104.55 | 172.95 | -153.67 | 225.92 |
| Muros en mamposteria est (kN/m) | -86.35 | 81.53 | -132.89 | 125.31 | -153.77 | 200.29 | -67.89 | 91.31 | -90.27 | 149.46 | -132.02 | 194.89 |

De los resultados de las modelaciones mediante elementos finitos listados en la Tabla 42, se determina comparando los modelos por los tres sistemas estructurales que la estructura en pórticos en concreto tiene las magnitudes mayores de cortante tanto en “x” como en “y”.

Se determinó para los esfuerzos cortantes, un incremento en las magnitudes cuando se compara los casos de un edificio y los edificios adyacentes. Sin embargo, para pórticos en concreto, el esfuerzo cortante “xz” mantiene su relación de valor de cortante máximo en el caso de un solo edificio y dos

edificaciones adyacentes cargadas simultáneamente, aumentando para la condición en la que se considera la edificación colindante cargada de manera posterior.

Tabla 43: Comparativo resultados de cortante para modelo de Winkler

| Modelo método de Winkler | | | | |
|--|-------------------|--------|-------------------|--------|
| | Cortante x | | Cortante y | |
| | Mínimo | Máximo | Mínimo | Máximo |
| Portico en concreto (kN/m) | -528.17 | 670.38 | -528.17 | 670.38 |
| Muros de carga (kN/m) | 95.18 | 109.18 | -161.09 | 350.38 |
| Muros en mamposteria est (kN/m) | -96.62 | 283.43 | -121.93 | 318.69 |

De los resultados de las modelaciones por método de Winkler, para los cortantes máximo y mínimo para los ejes “x” y “y”, el sistema estructural de pórticos en concreto tiene mayores magnitudes de esfuerzo cortante que los demás sistemas evaluados.

Los valores de esfuerzo cortante son mayores en los resultados del método de Winkler (Ver Tabla 43) en comparación con los resultados de la modelación de elementos finitos. Sin embargo, estos resultados son generales para toda el área de la cimentación, no se evaluó una sección determinada de cada cimentación.

Tabla 44: Comparativo resultados de momentos para modelo de elementos finitos

| Modelo elementos finitos | | | | | | | | | | | | |
|--|-------------------|--------|---------------------------------------|--------|---|--------|-------------------|--------|---------------------------------------|--------|---|--------|
| | Momento xx | | | | | | Momento yy | | | | | |
| | Un edificio | | Edificios adyacentes carga simultanea | | Edificios adyacentes carga edif 2 posterior | | Un edificio | | Edificios adyacentes carga simultanea | | Edificios adyacentes carga edif 2 posterior | |
| | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| Portico en concreto (kN*m) | -18.77 | 321.26 | -118.98 | 330.3 | -161.7 | 331.39 | -22.97 | 283.23 | -109.37 | 310.99 | -167.4 | 306.17 |
| Muros de carga (kN*m) | 1.05 | 67.33 | -2.83 | 218.27 | -30.26 | 300.45 | 1.21 | 67.34 | -1.38 | 220.38 | -39.81 | 304.8 |
| Muros en mamposteria est (kN*m) | -2.52 | 185.85 | -2.52 | 185.85 | -26.14 | 260.58 | -1.17 | 185.75 | -1.17 | 190.45 | -33.65 | 264.34 |

De los resultados de las modelaciones mediante elementos finitos listados en la Tabla 44, comparando los modelos por los tres sistemas estructurales, se determina que la estructura en pórticos en concreto tiene las mayores magnitudes de momento tanto en “x” como en “y”. Se obtiene un incremento en

las magnitudes de los máximos momentos de los edificios con colindancia con respecto a un solo edificio.

Tabla 45: Comparativo resultados de momentos para modelo de Winkler

| Modelo método de Winkler | | | | |
|--|------------|---------|------------|---------|
| | Momento xx | | Momento yy | |
| | Mínimo | Máximo | Mínimo | Máximo |
| Portico en concreto (kN*m) | -715.70 | 652.00 | -724.09 | 662.67 |
| Muros de carga (kN*m) | -1256.23 | 1238.36 | -1044.45 | 956.35 |
| Muros en mampostería est (kN*m) | -1566.92 | 1480.00 | -1631.47 | 1539.91 |

De los resultados de las modelaciones por método de Winkler listados en la Tabla 45, para los cortantes máximo y mínimo para los ejes “x” y “y”, el sistema estructural de muros en mampostería tiene mayores magnitudes de cortante que los demás sistemas evaluados.

Los valores de cortante son mayores en los resultados del método de Winkler en comparación con los resultados de la modelación de elementos finitos; para el método de Winkler, se tomó la de referencia los cortantes en el eje F.

5.4.2.5. Incrementos de los esfuerzos en profundidad

De acuerdo con los resultados de los análisis de elementos finitos, en la Figura 110 y Figura 111 se ilustran los esfuerzos iniciales del suelo.

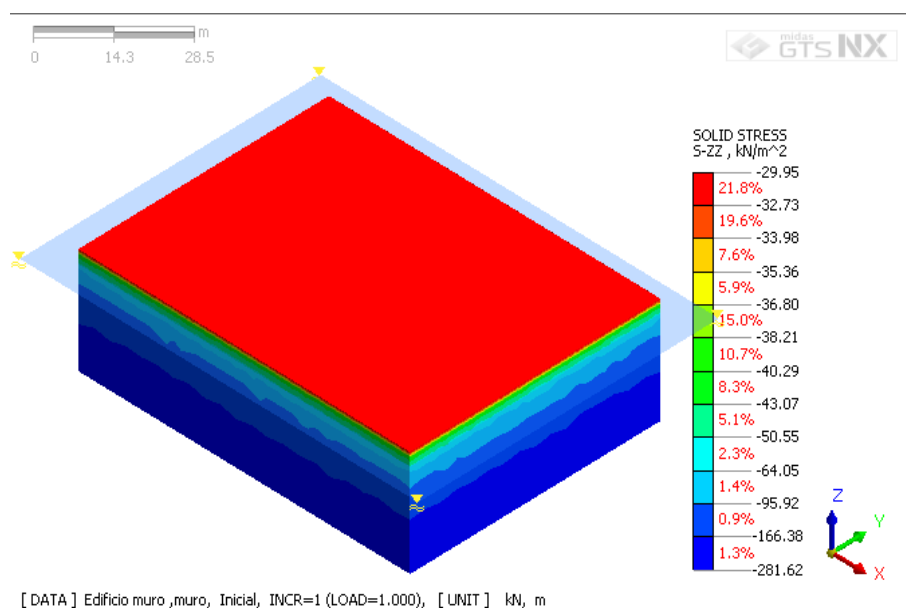


Figura 110: Esfuerzos iniciales del suelo analizado en 3D por elementos finitos

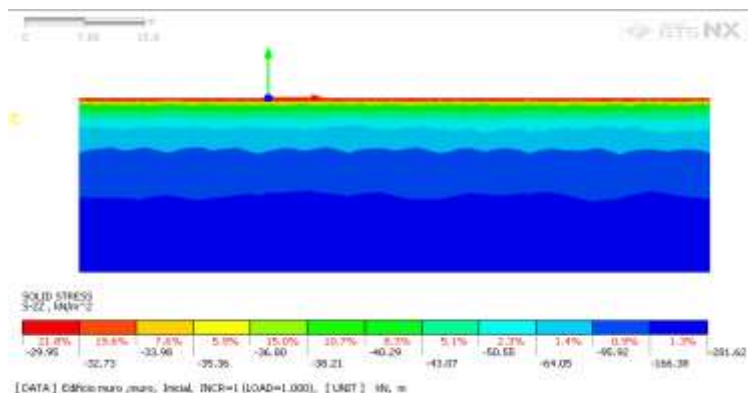


Figura 111: Esfuerzos iniciales del suelo analizado en corte vertical por elementos finitos

En la Tabla 46, se obtienen las magnitudes de los esfuerzos iniciales del suelo analizado por elementos finitos para todos los casos de sistemas estructurales

Tabla 46: Magnitudes de esfuerzos iniciales del suelo analizado

| Z (m) | Esfuerzo Efectivo (kPa) | Z (m) | Esfuerzo Efectivo (kPa) |
|-------|-------------------------|-------|-------------------------|
| | Inicial | | Inicial |
| 0.00 | 31.11 | 13.33 | 161.63 |
| 0.83 | 36.08 | 14.17 | 175.39 |
| 1.67 | 41.26 | 15.00 | 184.34 |
| 2.50 | 46.52 | 15.83 | 201.01 |
| 3.33 | 54.99 | 16.67 | 215.70 |
| 4.17 | 63.62 | 17.50 | 222.76 |
| 5.00 | 76.37 | 18.33 | 222.85 |
| 5.83 | 80.56 | 19.17 | 232.07 |
| 6.67 | 95.57 | 20.00 | 235.93 |
| 7.50 | 95.76 | 20.83 | 236.28 |
| 8.33 | 111.75 | 21.67 | 236.61 |
| 9.17 | 122.55 | 22.50 | 240.40 |
| 10.00 | 132.19 | 23.33 | 247.40 |
| 10.83 | 135.86 | 24.17 | 252.56 |
| 11.67 | 150.30 | 25.00 | 253.59 |
| 12.50 | 154.85 | | |

5.4.2.5.1. Incrementos de los esfuerzos para el sistema estructural pórticos en concreto

De acuerdo con los resultados de los análisis de elementos finitos, en la Figura 112 y Figura 113 se ilustran los esfuerzos totales después de colocar las cargas simultáneas de las estructuras superficiales en pórticos en concreto.

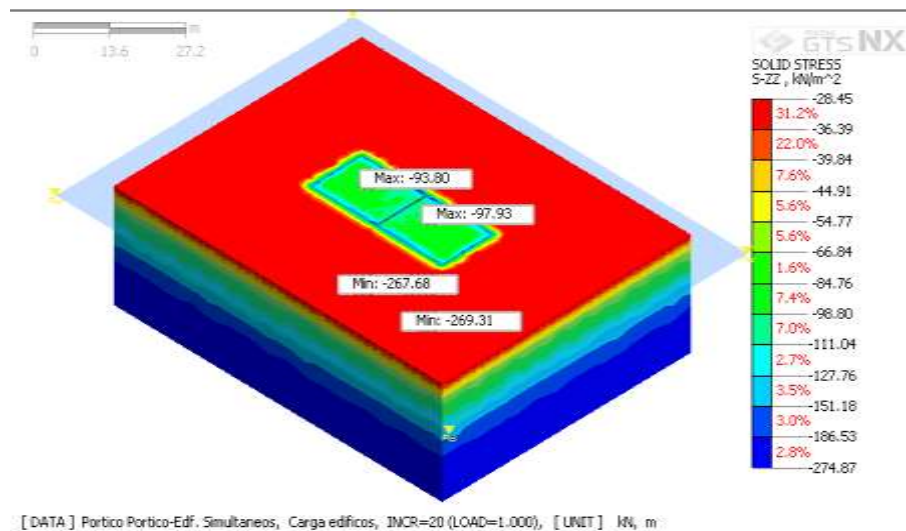


Figura 112: Esfuerzos totales del suelo analizado en 3D por elementos finitos por carga de edificaciones en porticos en concreto, adyacentes de manera simultanea.

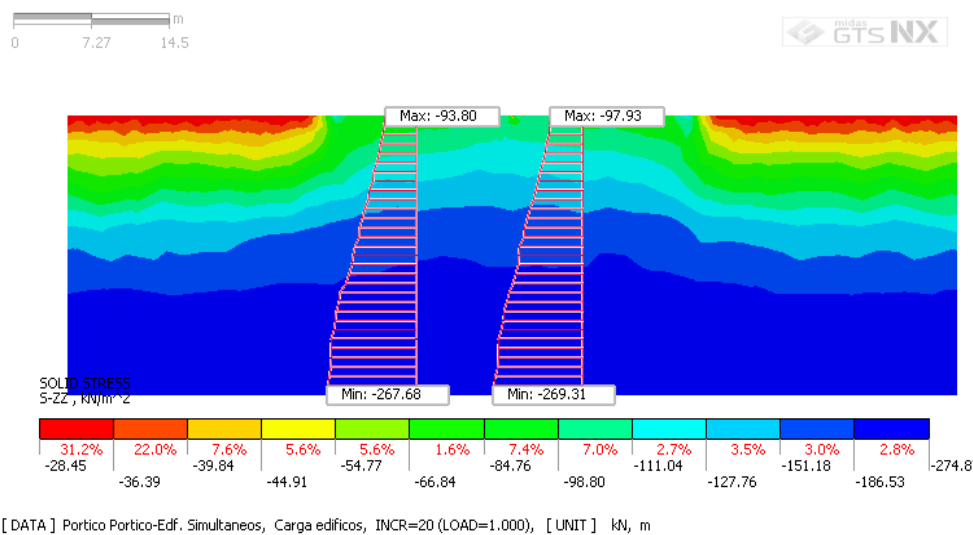


Figura 113: Esfuerzos totales del suelo analizado en corte vertical por elementos finitos por carga de edificaciones en porticos en concreto, adyacentes de manera simultanea.

La Figura 114 muestra la variación de los esfuerzos efectivos con respecto a la profundidad. Para los edificios adyacentes, las magnitudes son similares entre edificios, teniendo en cuenta que han sido cargados simultáneos.

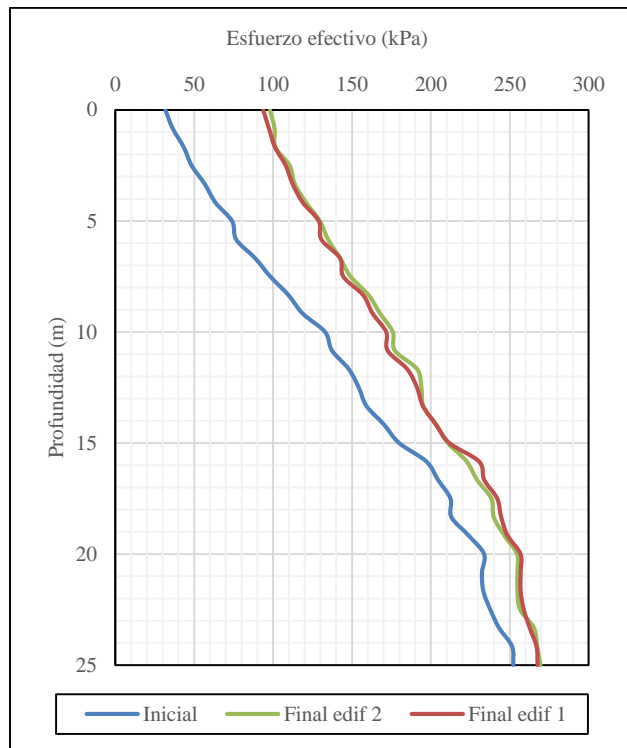


Figura 114: Variación de esfuerzos efectivos en kPa con respecto a la profundidad para estructuras cargadas simultaneas en porticos en concreto

En la Figura 115 y Figura 116 se ilustran los esfuerzos totales después de colocar las cargas de manera posterior de las estructuras superficiales en pórticos en concreto.

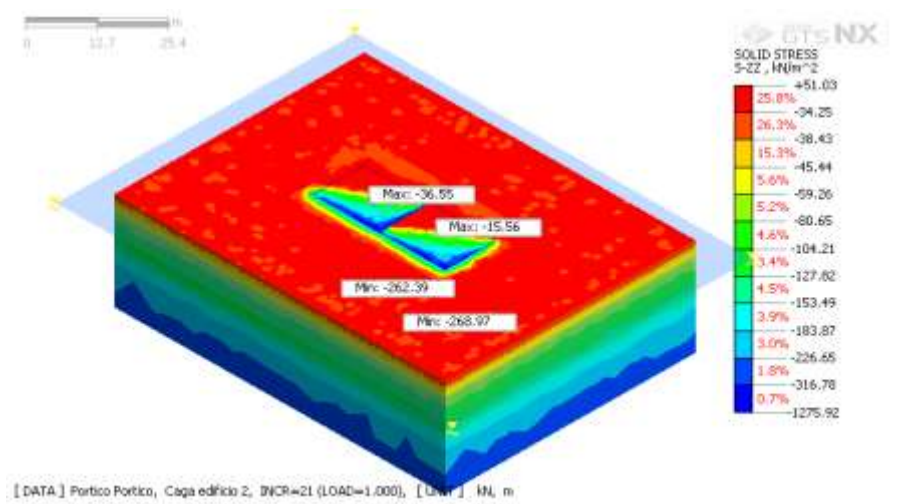


Figura 115: Esfuerzos totales del suelo analizado en 3D por elementos finitos por carga de edificaciones en porticos en concreto, adyacentes de manera posterior.

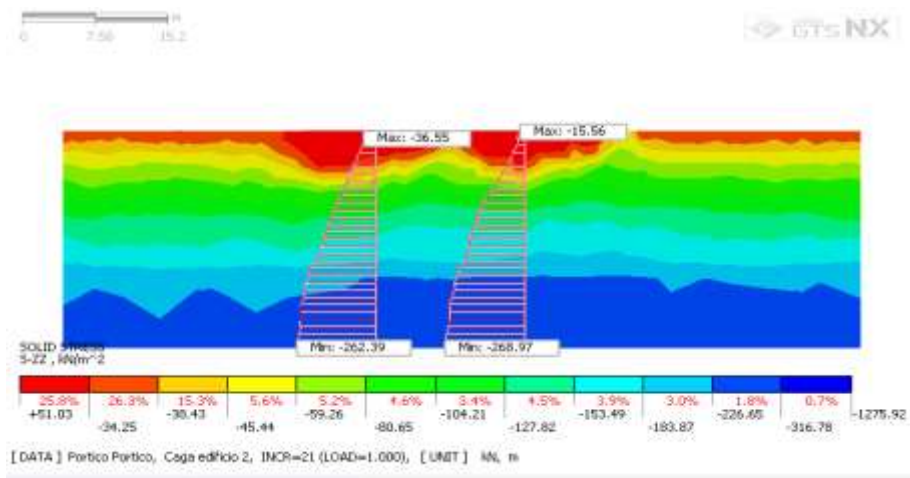


Figura 116: Esfuerzos totales del suelo analizado en corte vertical por elementos finitos por carga de edificaciones en porticos en concreto, adyacentes de manera posterior.

La Figura 117 muestra la variación de los esfuerzos efectivos con respecto a la profundidad. Para los edificios adyacentes, las magnitudes del edificio 1 son mayores en los primeros 5m de profundidad con respecto al edificio 2, teniendo en cuenta que han sido cargados de manera posterior.

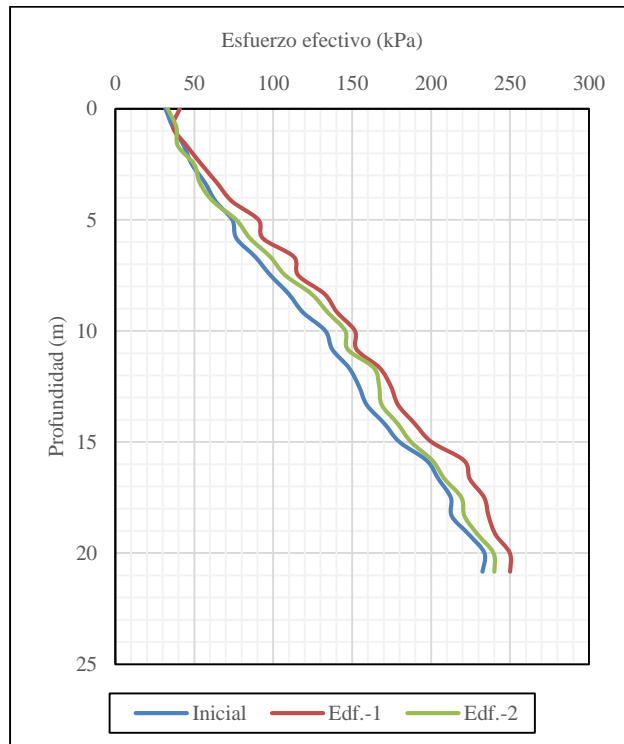


Figura 117: Variación de esfuerzos efectivos en kPa con respecto a la profundidad para estructuras cargadas posteriormente en porticos en concreto

5.4.2.5.2. Incrementos de los esfuerzos para el sistema estructural muros de carga

De acuerdo con los resultados de los análisis de elementos finitos, en la Figura 118 y Figura 119 se ilustran los esfuerzos totales después de colocar las cargas simultáneas de las estructuras superficiales en muros de carga.

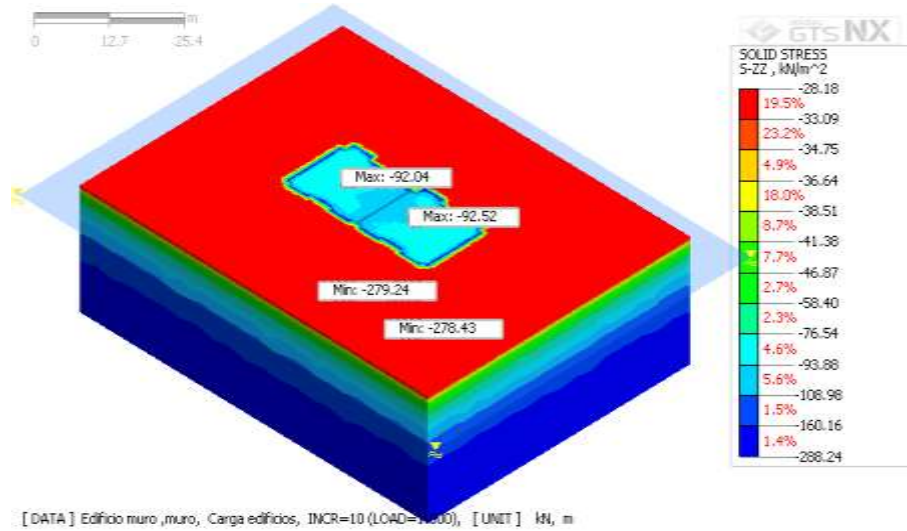


Figura 118: Esfuerzos totales del suelo analizado en 3D por elementos finitos por carga de edificaciones en muros de carga, adyacentes de manera simultanea.

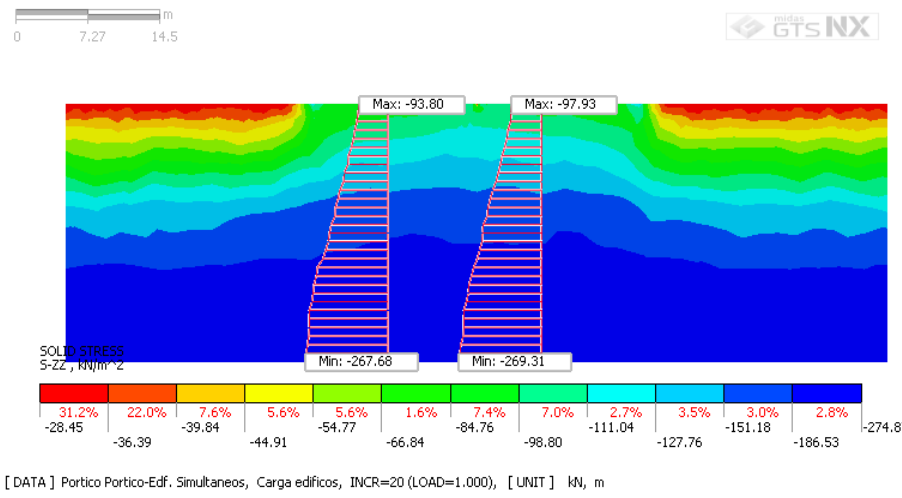


Figura 119: Esfuerzos totales del suelo analizado en corte vertical por elementos finitos por carga de edificaciones en muros de carga, adyacentes de manera simultanea.

La Figura 120 muestra la variación de los esfuerzos efectivos con respecto a la profundidad. Para los edificios adyacentes, las magnitudes son similares entre edificios, teniendo en cuenta que han sido cargados simultáneos.

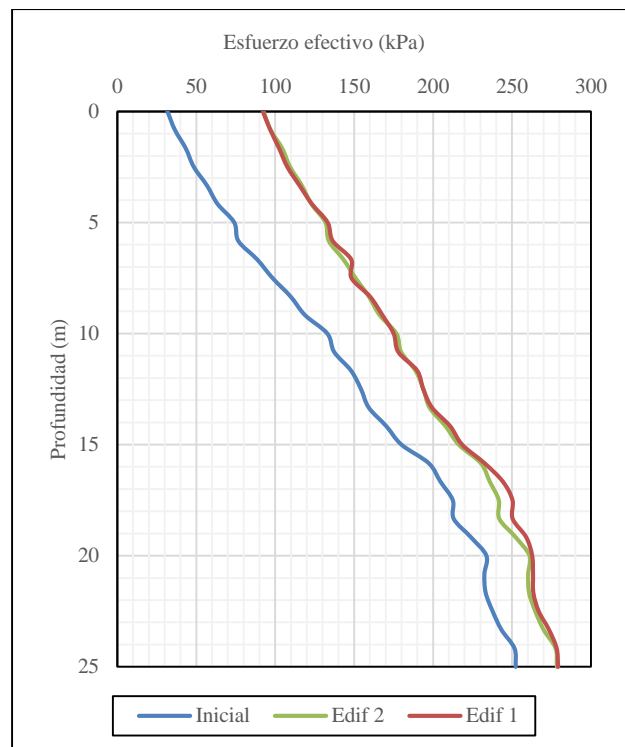


Figura 120: Variación de esfuerzos efectivos en kPa con respecto a la profundidad para estructuras cargadas simultánea en muros de carga

En la Figura 121 y Figura 122 se ilustran los esfuerzos totales después de colocar las cargas de manera posterior de las estructuras superficiales en muros de carga.

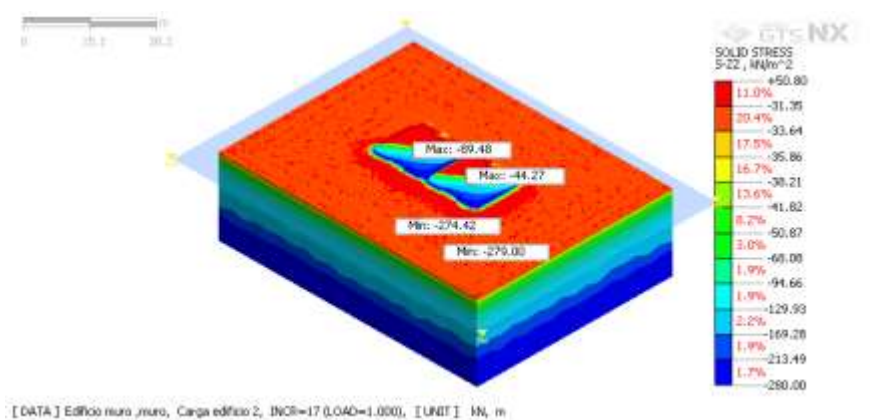


Figura 121: Esfuerzos totales del suelo analizado en 3D por elementos finitos por carga de edificaciones en muros de carga, adyacentes de manera posterior.

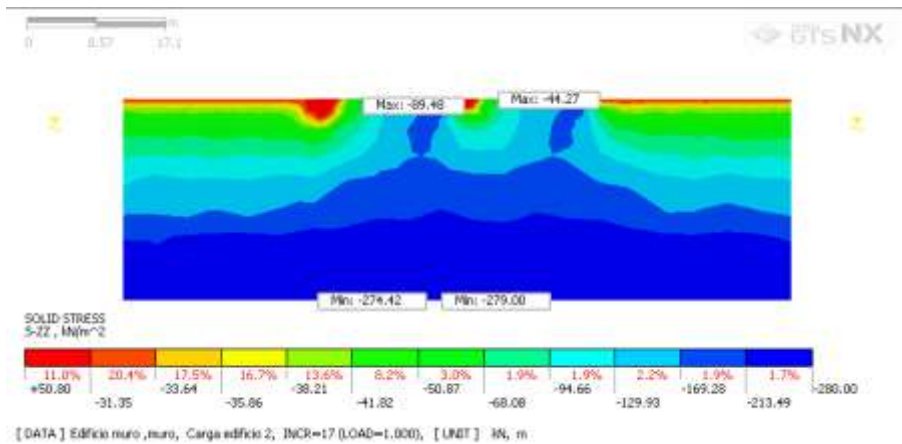


Figura 122: Esfuerzos totales del suelo analizado en corte vertical por elementos finitos por carga de edificaciones en muros de carga, adyacentes de manera posterior.

La Figura 123 muestra la variación de los esfuerzos efectivos con respecto a la profundidad. Para los edificios adyacentes, las magnitudes del edificio 1 son mayores en los primeros 10 m de profundidad con respecto al edificio 2, teniendo en cuenta que han sido cargados de manera posterior.

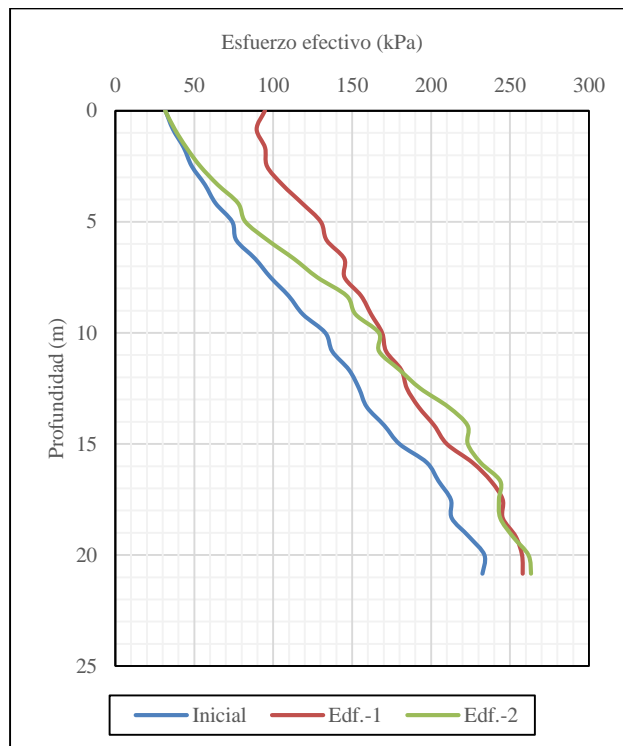


Figura 123: Variación de esfuerzos efectivos en kPa con respecto a la profundidad para estructuras cargadas posteriormente en muros de carga

5.4.2.5.3. Incrementos de los esfuerzos para el sistema estructural mampostería estructural

De acuerdo con los resultados de los análisis de elementos finitos, en la Figura 124 y Figura 125 se ilustran los esfuerzos totales después de colocar las cargas simultáneas de las estructuras superficiales en muros en mampostería.

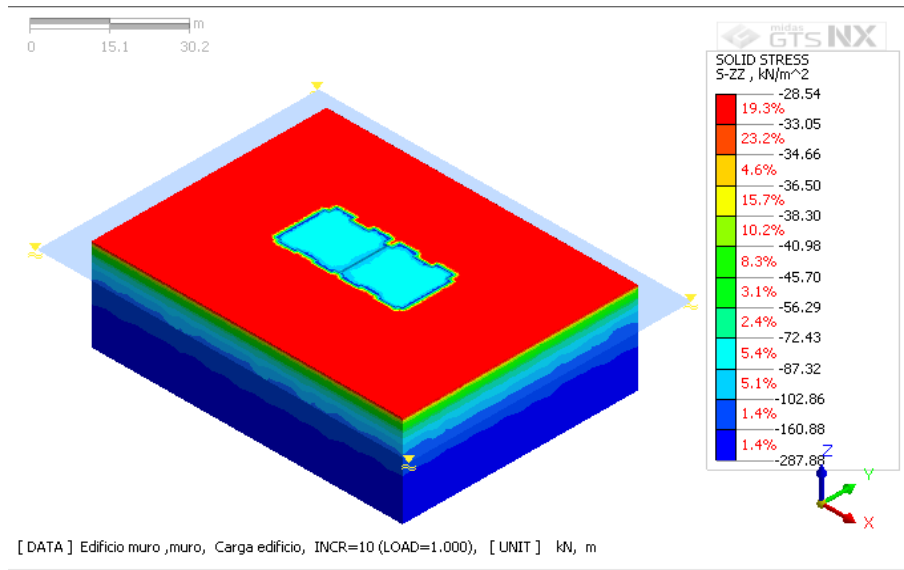


Figura 124: Esfuerzos totales del suelo analizado en 3D por elementos finitos por carga de edificaciones en muros en mampostería, adyacentes de manera simultanea.

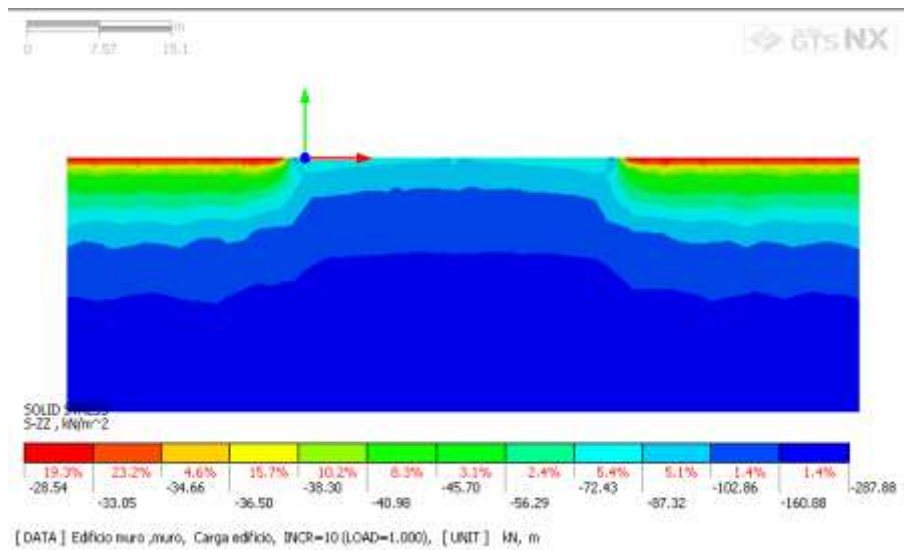


Figura 125: Esfuerzos totales del suelo analizado en corte vertical por elementos finitos por carga de edificaciones en muros en mampostería, adyacentes de manera simultanea.

La Figura 126 muestra la variación de los esfuerzos efectivos con respecto a la profundidad. Para los edificios adyacentes, las magnitudes son similares entre edificios, teniendo en cuenta que han sido cargados simultáneos.

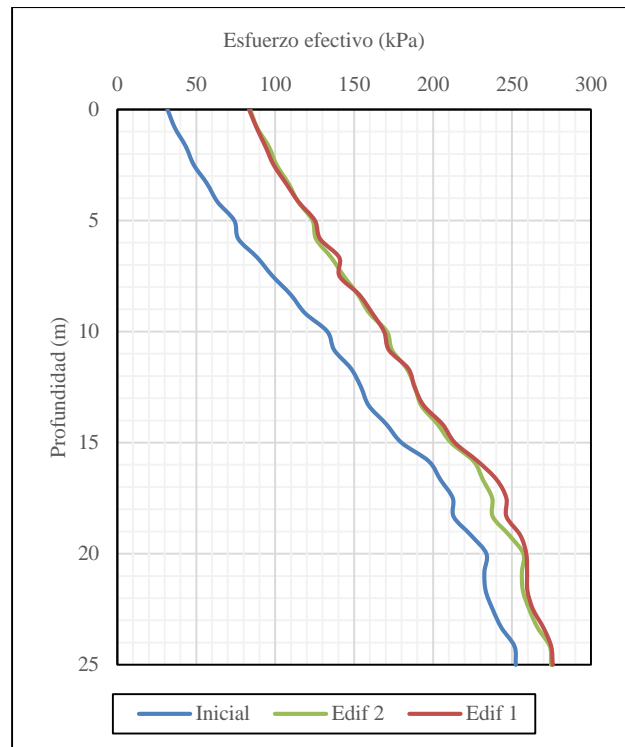


Figura 126: Variación de esfuerzos efectivos en kPa con respecto a la profundidad para estructuras cargadas simultánea en muros en mampostería.

En la Figura 127 y Figura 128 se ilustran los esfuerzos totales después de colocar las cargas de manera posterior de las estructuras superficiales en muros de carga.

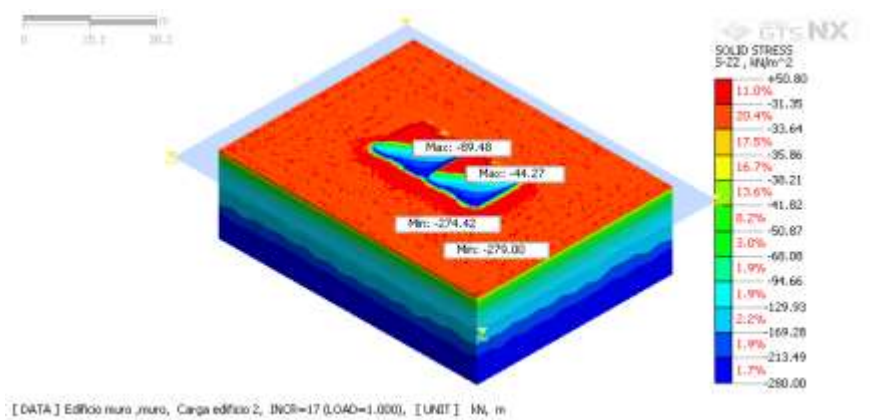


Figura 127: Esfuerzos totales del suelo analizado en 3D por elementos finitos por carga de edificaciones en muros en mampostería, adyacentes de manera posterior.

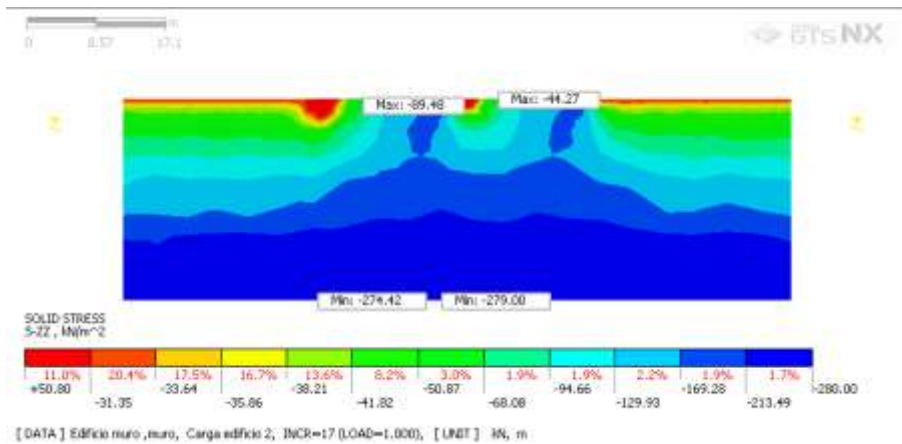


Figura 128: Esfuerzos totales del suelo analizado en corte vertical por elementos finitos por carga de edificaciones en muros en mampostería, adyacentes de manera posterior.

La Figura 129 muestra la variación de los esfuerzos efectivos con respecto a la profundidad. Para los edificios adyacentes, las magnitudes del edificio 1 son mayores en los primeros 10m de profundidad con respecto al edificio 2, teniendo en cuenta que han sido cargados de manera posterior.

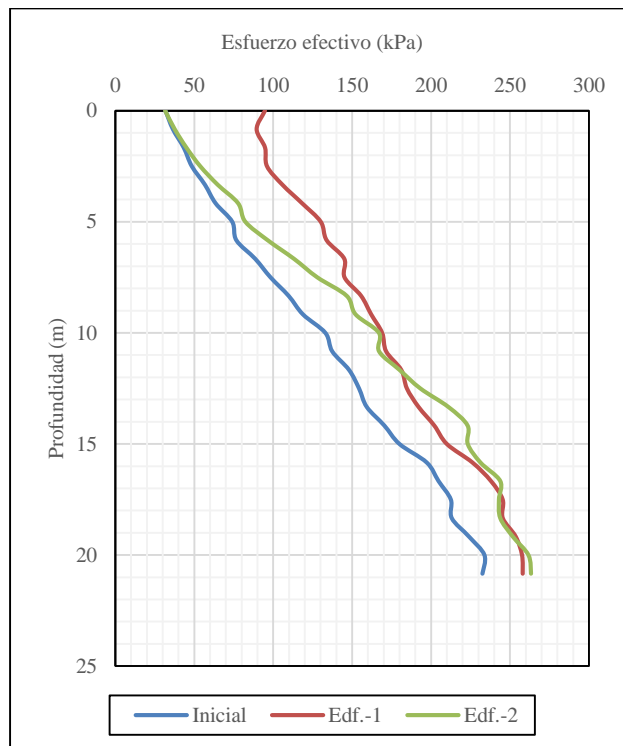


Figura 129: Variación de esfuerzos efectivos en kPa con respecto a la profundidad para estructuras cargadas posteriormente en muros de mampostería.

6. Conclusiones:

- Mediante la modelación basada en método de Winkler no se pueden evaluar asentamientos totales, dado que el programa empleado SAP2000 V23.1.0. estima asentamientos con base en la configuración geométrica y ejes de la cimentación, pudiendo de estos, únicamente obtener asentamientos diferenciales; lo cual, para el análisis de la acción de estructuras adyacentes, es necesario estimar en términos de asentamientos totales las dos edificaciones. Los asentamientos totales obtenidos por la metodología por elementos finitos, al considerar las estructuras adyacentes cargadas de manera simultánea, aumentan, con respecto a la evaluación de solo una edificación; y si se considera la aplicación de la carga de un edificio adyacente de manera posterior, estos asentamientos incrementan en mayor medida de los dos casos anteriores.
- Las deformaciones cortantes en el suelo, bajo la modelación por elementos finitos, son mayores en el sistema de muros en mampostería estructural, seguido de muros de carga y en menor porcentaje para pórticos en concreto; para el caso en donde las edificaciones son cargadas de manera simultánea, las deformaciones cortantes disminuyen con respecto a la evaluación de una sola edificación, ya que al ser cargadas simultáneamente, estas funcionan como si fuese una sola placa de cimentación; caso contrario, cuando se considera la secuencia constructiva de un edificio con respecto al otro, en donde incrementan las deformaciones en las secciones de convergencia de los edificios; para el presente trabajo, la separación se consideró a una distancia de 0.30m de separación de edificio por requerimiento sísmico estructural.
- El método de Winkler es un método simplificado que permite tener en cuenta la respuesta del suelo de soporte, simulando este como resortes, la relación esfuerzo/deformación no expresa el comportamiento real del suelo, adicionalmente, frente a la acción simultánea de estructuras adyacentes, los incrementos de esfuerzos en el suelo, no se pueden representar mediante esta metodología; no obstante, bajo la modelación por elementos finitos, los incrementos en los esfuerzos son inferiores a los esfuerzos resultado de la modelación por el método Winkler; por lo que el método de Winkler obtiene altos factores de seguridad en el diseño, al ser una metodología conservadora; sin embargo, al considerar la secuencia constructiva de los edificios, en la modelación de elementos finitos, el incremento de los esfuerzos cortantes supera los esfuerzos resultado del modelo de Winkler, presentándose la variación en el edificio que fue cargado inicialmente.

- Los valores de los momentos y cortantes en los ejes “x” y “y”, de los resultados obtenidos por la modelación tipo Winkler, resultan superiores a la modelación de elementos finitos; sin embargo, cuando los edificios no son cargados de manera simultánea y el segundo es cargado de manera posterior, los mayores momentos y cortantes se presentan en el edificio cargado inicialmente, este comportamiento se ve representado bajo la modelación por elementos finitos únicamente.

7. Recomendaciones:

- Las modelaciones, los análisis y resultados obtenidos se tomaron por acción simultánea de estructuras adyacentes y carga posterior de edificio 2 por construcción, se recomienda profundizar en la respuesta del suelo y cimiento ante la acción no simultánea, teniendo en consideración el tiempo de carga inicial de una de las estructuras.
- Plantear la separación necesaria para el par de edificaciones, para los diferentes sistemas estructurales, en los cuales, no se presente superposición de bulbos de esfuerzos y deformaciones que sean perjudiciales para las estructuras, ya que en el presente trabajo no se abordó.

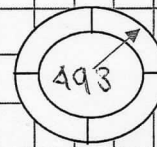
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Anexos:

ANEXO No 1
ESTUDIO DE SUELOS DE REFERENCIA



**ESTUDIO DE SUELOS Y
RECOMENDACIONES DE CIMENTACION
PARA LA CONSTRUCCION EDIFICIO EN SEIS
PISOS Y SOTANO CON DESTINO A
COMERCIO UBICADA EN LA CARRERA 13
No 10-83/85/91 BOGOTA D.C**

DICIEMBRE DE 2013

INGEOLAB

LABORATORIO DE SUELOS CONCRETOS Y PAVIMENTOS

Mosquera, Cundinamarca. Diciembre de 2013

Señores:

CURADURIA DE BOGOTA D.C

Ciudad

Respetados Señores:

YO, JOSE MARIA MICAN NECHIZA, Ingeniero Civil con matricula Profesional No 2520210173 Cnd, debidamente registrado en el consejo Profesional de Ingeniería y Arquitectura de Cundinamarca, presento el estudio de suelos y recomendaciones de cimentación para la construcción Edificio en seis pisos y sotano ubicado en la carrera 13 No 10-83/85/91 Bogota D.C. elaborados de acuerdo a los requerimientos de la **NORMA COLOMBIANA DE DISEÑO Y CONSTRUCCIONES SISMO RESISTENTES NSR-10, LEY 400 de 1997 Y DECRETO 926 de Marzo de 2010, DECRETO 0.92 DEL 17 DE ENERO DE 2011.**

Declarando que asumo la responsabilidad por los perjuicios que a causa a de ellos puedan deducirse, siempre y cuando se cumplan las recomendaciones y especificaciones dadas en el estudio.

Acepto y reconozco que la revisión efectuada por esta dependencia no constituye una aprobación al diseño estructural, sino una verificación al cumplimiento de la **NORMA COLOMBIANA DE DISEÑO Y CONSTRUCCION SISMO RESISTENTE.**

Cordialmente

INGEOLAB SAS

LABORATORIO DE INGENIERIA CIVIL



JOSE MARIA MICAN NECHIZA
C.C. No 17.183.450 de Bogota
Ingeniero Civil M.P 2520210173

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Parte I

CARTAS DE AUTORIZACION

INDICE DE MODIFICACIONES

| INDICE DE REVISIÓN | SECCION MODIFICADA | FECHA DE MODIFICACION | OBSERVACIONES |
|--------------------|--------------------|-----------------------|---------------|
| 1 | INFORME DE SUELOS | DICIEMBRE DE 2013 | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

Cuadro 1: INDICE DE MODIFICACIONES

REVISION Y APROBACIÓN

| | | |
|-----------------------------|--------|---|
| NUMERO DE REVISIÓN | | 1 |
| RESPONSABLE POR ELABORACIÓN | NOMBRE | ING. JOSE MARIA MICAN |
| PROPIETARIO DEL PROYECTO | NOMBRE | SR. NICOLAS ALBERTO JIMENEZ OROZCO DIANA MILENA GIRALDO RAMIREZ Y OTRO |
| RESPONSABLE POR APROBACIÓN | NOMBRE | CURADURIA URBANA |
| | FECHA | DICIEMBRE DE 2013 |

Cuadro 2: NUMERO DE REVISION

Part II

DESCRIPCIÓN Y GENERALIDADES

0.1. DESCRIPCIÓN Y GENERALIDADES

0.1. Descripción y generalidades

La edificación denominada GIFT & TOYS, se encuentra ubicado en la carrera 13 No 10-83/85/91 sector de San Victorino Bogota D.C. La obra se desarrollara en 6 pisos y sotano con area de construccion de 263.25 m² aproximadamente. con destino comercio. El sistema estructural sera aporticado con elementos en concreto reforzado cuyas dimensiones y especificaciones de materiales formaran parte del calculo estructural. La cubierta estara formada por placa de concreto. El presente estudio se ejecuto conforme a la Norma NSR10 y decreto 523 del 16 de diciembre de 2010.

0.2. Descripción geografica y características del proyecto en mención

0.2.1. Ubicacion según la microzonificación

De acuerdo al decreto 523 por el cual se adopta la microzonificacion sismica de Bogota. tabla No 3 coeficientes y curva de diseño corresponde a la microzona PIEDEMONTA B, corresponde suelo coluvial y aluvial con espesor superior a 12.00 metros, bloques cantos y gravas con matriz arcillo arenosos y areno arcillosas. Los parámetros sismicos de este sector tienen los siguientes coeficientes de diseño:

☒ Coeficientes de diseño

- Fa : 1.95
- Fv : 1.70
- Tc : 0.56
- TL : 3.00
- Ao : 0.26
- Tipo de suelo: D (De acuerdo al numeral 5.14 del decreto 523 del 16 de diciembre de 2010 por el cual se adopta la microzonifacion sismica de Bogota D.C). Segun los perfiles estratigraficos, hasta la profundidad explorada no se encontraron estratos arenosos, arcillas sensitivas ni material organico (Turbas y suelos altamente organicos), Por tal razon no se hace necesario hacer estudios adicionales. El indice de plasticidad no alcanza el 75 %, tal como lo indica el cuadro de ensayos de laboratorio.

☒ Coeficientes de umbral de daño

- Fad: 2.20
- Fvd: 2.25
- Tcd: 0.51
- Tld: 3.00
- Aod: 0.12

☒ Grupo de uso I, de acuerdo a A. 2.5.1.4 estructuras de ocupacion normal NSR-10

ZONAS GEOTÉCNICAS

Mapa No. 1
ZONAS GEOTÉCNICAS

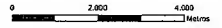


REPÚBLICA DE COLOMBIA



ALCALDÍA MAYOR
DE BOGOTÁ D.C.
SECRETARÍA DISTRITAL DE
PLANEACIÓN

ESCALA 1:40.000



CARACTERÍSTICAS TÉCNICAS

Sistema Proyección Cartográfica: DATUM MAGNÉTICO BOGOTÁ
Proyección Transversa de Mercator
Coordenadas para el centro del Bogotá con origen cartográfico: Fijadas
Coordenadas UTM: Zona 18Q, Datum: WGS 84, Escala: 1:250,000
Origen en la intersección del paralelo -74° 14'55.63" con
el ecuador 4° 04' 00.00".
Plano de proyección 2.589 metros sobre el nivel medio del mar

Fuente: Geografía:
Cadastral: Alcaldía Mayor de Bogotá, el Territorio,
Instituto Geográfico Agustín Codazzi
Censos:
Instituto de Estudios de Bogotá, Bogotá 2000
Estructura de Bogotá de 2000
Elaboración: Samuel Moreno Rojas, 19 de febrero de 2010

Fecha:
DICIEMBRE DE 2010

CONVENCIONES

- Limite Distrito Capital
- Perimetro Urbano
- Limite municipio
- Vias arterias
- Linea Férrea

LEYENDA

- Cerros A
- Cerros B
- Piedemonte A
- Piedemonte B
- Piedemonte C
- Lacustre A
- Lacustre B
- Lacustre C
- Aluvial
- Llanura A
- Llanura B
- Cauce
- Depósito ladera
- Suelo residual
- Basura
- Relleno
- Excavación

SAMUEL MORENO ROJAS
ALCALDE MAYOR DE BOGOTÁ D.C.

MARÍA CAMILA URIBE SÁNCHEZ
SECRETARÍA DISTRITAL DE PLANEACIÓN



0.2. DESCRIPCIÓN GEOGRAFICA Y CARACTERISTICAS DEL PROYECTO EN MENCIÓN

0.2.2. Geología Local

La ciudad de Bogotá se localiza en promedio a 2650m de altitud sobre el eje de la cordillera oriental de Colombia. Geomorfologicamente hablando se diferencian dos zonas: 1) la plana, ubicada hacia la parte central del área en donde se encuentra la mayor parte de la población y 2) de relieve montañoso con una parte habitada, otra dedicada a la minería de tajo abierto (canteras, gravilleras y chircales) y otra aun no intervenida por el hombre, localizados en los sectores oriental y suroccidental de la ciudad.

La zona plana es drenada por el río Bogotá que corre en sentido NNE-SSW con sus afluentes Tunjuelo, Fucha, Y Juan Amarillo, La zona montañosa es drenada por los ríos Tunjuelos, San Francisco y quebradas de menor caudal que corren en sentido S-N y E-W que al entrar a la zona plana sus cauces se utilizan como canales de conducción de las aguas servidas de la capital de los ríos Tunjuelito y Bogotá.

Geologicamente la ciudad se localiza sobre un extenso relleno sedimentario que conforman la Sabana de Bogotá y esta rodeada por cerros constituidos por rocas de tipo areniscas, arcillolitas y conglomerados.

0.2.3. Geología estructural

Se describe a continuación, algunos de los rasgos estructurales más notorios y se presentan interpretaciones sencillas, con el objeto de aportar ideas acerca de la génesis de la depresión que hoy ocupa la Sabana de Bogotá.

Por la conformación tectónica y estructural, el área de trabajo se ha subdividido en tres partes: a) Bloque localizado en el norte de la falla de Usaquen, B) bloque al sur de la falla de San Cristóbal c) bloque central hundido, para este caso en particular se trabajará el bloque central

0.2.3.1. Bloque central

Limita al sur y norte con las fallas de Usaquen y San Cristóbal - Facatativa, respectivamente. En este sector se la mayor amplitud y profundidad del relleno cuaternario de la sabana, además de otras particularidades como la inversión de las formaciones litológicas que conforman los cerros orientales.

La falla de Bogotá es una falla de cabalgamiento de dirección nor-noreste y plano buzando al este, el cual pone en contacto areniscas del grupo Guadalupe y arcillolitas de la formación de Guaduas, sobre la parte media baja de los cerros al oriente de Bogotá, su traza está bien definida en el bloque central y sur, pero hacia el norte luego de Usaquen no se tiene conocimiento de su continuidad.

La falla de San Cristóbal controla el curso del río del mismo nombre, en los cerros orientales de la sabana. Su prolongación hacia el sur este se manifiesta por la serie de rasgos topográficos y drenajes alineados, la prolongación de su traza hacia el NW parece limitar el borde sur de la depresión de Funza y de manera aproximada con el límite sur del relieve plano del valle de la sabana. Esta falla junto con el sistema de fallas de Facatativa, marca la frontera sur de la cuenca de la Sabana de Bogotá las cuales probablemente ejercieron control tectónico que sirvió de barrera estructural e impidió la depositación hacia el sur.

0.2.4. Evaluación preliminar de cargas

Las cargas a considerar en este tipo de proyectos para un análisis de capacidad portante y asentamientos serán:

- ✘ Cargas muertas debidas al peso propio del elemento
- ✘ Cargas vivas

0.2. DESCRIPCIÓN GEOGRAFICA Y CARACTERISTICAS DEL PROYECTO EN MENCIÓN

- ✠ Cargas debidas a excentricidad
- ✠ Fuerzas sismicas

Part III

DIRECCION Y LOCALIZACIÓN

0.3. DIRECCIÓN Y UBICACIÓN

0.3. Dirección y ubicación

La figura No 1 y No 2 presenta la ubicación del sector objeto de estudio.

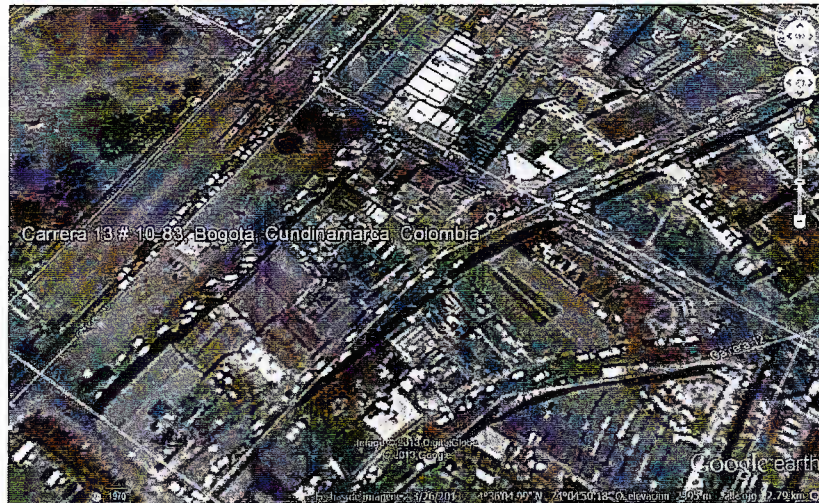


Figura 1: Carrera 13 No 10-83/85/91 Bogota

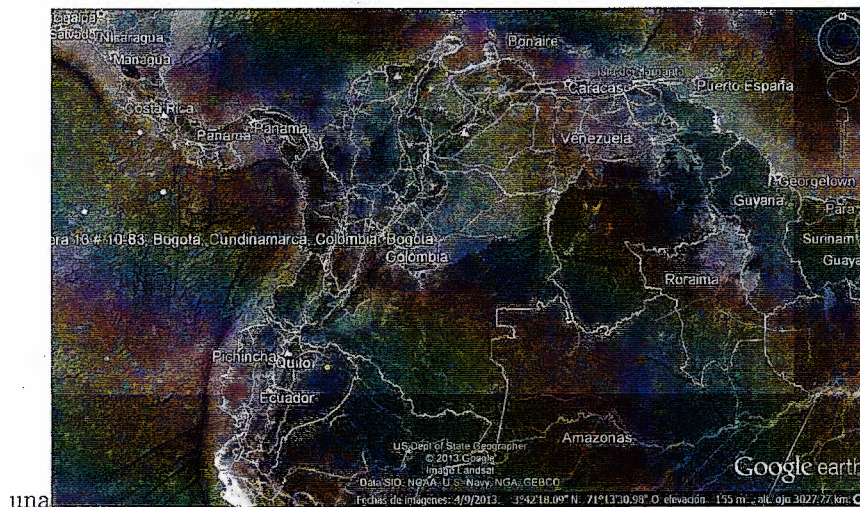


Figura 2: Bogotá en Colombia

Part IV

OBJETIVOS Y ALCANCE

0.4. ALCANCE

0.4. Alcance

En este informe se establecen criterios básicos para la elaboración del estudio geotécnico que comprenden la investigación del subsuelo, los análisis de capacidad portante y las recomendaciones necesarios desde el punto de vista geotécnico para la construcción del proyecto en mención, de manera que se garantice un adecuado comportamiento de la estructura, se pretende evaluar la información recolectada de los ensayos de laboratorio realizados sobre las muestras tomadas de los sondeos.

0.5. Objetivos

Determinar las condiciones físico mecánicas de los suelos existentes, además de evaluar la capacidad portante del suelo, y los asentamientos posibles del sistema con base en la información de campo recolectada y sometiendo el suelo a unos ensayos de laboratorio.

Parte V

INVESTIGACIÓN DEL SUBSUELO

0.6. INVESTIGACIÓN DEL SUBSUELO

0.6. Investigación del subsuelo

La estructura según la tabla H3-1.1 de la NSR-10 donde dice que para dos niveles se clasifica como categoría baja. Y según la tabla H.3.2.1. Para el estudio en mención se ejecutaron 4 sondeos manuales, de los cuales se recolectó muestras alteradas con el fin de ejecutar los ensayos físicos y mecánicos, tales como límites de atterberg, humedades, compresiones inconfinas etc, estos valores serán evaluados con el fin de obtener las características definitivas del suelo de fundación.

0.7. Localización del nivel freático

El nivel de aguas freáticas fueron encontradas en la elaboración de los 4 sondeos, (ver perfiles estratigráficos), sin embargo se debe prever un correcto manejo de aguas lluvias para que no afecte la estructura del suelo, además se debe prever unos sistemas de bombeo durante el proceso de construcción, para evitar infiltraciones en los aceros de la cimentación se recomienda recubrir el suelo de soporte con un concreto pobre cuyo espesor mínimo sea de 7 cm. para evitar daños en el refuerzo del acero por efectos de la oxidación e infiltración en la estructura que genere empujes verticales que puedan afectar a la misma.

0.8. Ensayos de laboratorio

- ✦ Sondeos
- ✦ Estratigrafía
- ✦ Humedad natural
- ✦ Límite líquido
- ✦ Límite plástico
- ✦ Granulometrías
- ✦ Ensayos de consolidación
- ✦ Clasificación

0.9. Perfil estratigráfico o unidad geotécnica

En la exploración del suelo se encontraron los siguientes estratos: Baldosa y placa en concreto, hasta profundidades de 0.15, 0.14, 0.10 y 0.12 metros. Relleno en limo arcillosos mezclados con escombros, hasta profundidades de 0.40, 0.50, 0.55 y 0.60 metros USC: MH. Limo arcilloso orgánico color gris con vetas café de alta compresibilidad, hasta profundidades de 1.40, 1.60, 1.80 y 1.70 metros USC: MH. Arcilla arenosa en matriz gravosa color habana grisácea con vetas amarillas de oxidación de humedad y plasticidad media alta consistencia media a blanda, hasta profundidades de 5.00, 5.20, 5.30 y 5.28 metros USC: Arcilla color gris de humedad y plasticidad media alta consistencia media a blanda, hasta profundidades de 15.10, 15.20, 15.12 y 15.60 metros USC: CH.

Part VI

CALCULO DE LA CAPACIDAD PORTANTE

0.10. CALCULO DE CAPACIDAD PORTANTE

0.10. Calculo de capacidad portante

Para el cálculo de la capacidad portante la NSR-10 recomienda hacer un analisis de capacidad basandose en los principios fundamentales establecidos POR LOS PROFESORES PECK, TERZAGHI ETC y cuya formulación la establece en el titulo H, y recomienda un factor de seguridad de 3.0

El analisis de capacidad de carga se basa en el principio del equilibrio límite el cual define tres cuñas de trabajo muy bien definidas, las cuales son: la zona Activa de Rankinee y la zona pasiva, estas zonas estan representadas en la siguiente figura:

Para el calculo de capacidad portante se define el tamaño de la cimentación y los parámetros de carga del mismo, los cuales estan definidos según las condiciones del suelo las cargas, el tipo de cimentación entre otros, la expresión para el cálculo de la capacidad portante se puede evaluar como

$$q_u = cN_{cs}d_c^i c + qN_{qs}d_q^i q + 0,5\gamma BN_{\gamma}s_{\gamma}d_{\gamma}^i \gamma \quad (0.10.1)$$

Donde cada uno de los coéfcientes es evaluados según las especificaciones del proyecto y entregados como anexo a este informe. Finalmente para el proyecto en mención se puede establecer que la capacidad portante del suelos es de 82.0KPA O 8.20 TON/M2 Y UN NIVEL DE FUNDACIÓN DE -3.80 M CON MEJORAMIENTO DEL SUELO, LA GRAFICA DE CAPACIDAD PORTANTE SE PRESENTA A CONTINUACION. (VER HOJAS ANEXAS)

Parte VII

ANALISIS DINAMICO Y PRUEBAS
DINAMICAS

0.11. PARÁMETROS DINÁMICOS DEL SUELO.

0.11. Parámetros dinámicos del suelo.

Dada la importancia del proyecto es importante evaluar las características dinámicas del suelo, para este se debe considerar las correlaciones dadas por varios autores, entre las cuales se destacan las dadas por el profesor STEVEN KRAMER DE LA UNIVERSITY OF WASHINGTON, quien define el modulo de rigidez del suelo como

$$G_{max} = 325 \times N_{60}^{0,68} \quad (0.11.1)$$

donde N_{60} es el valor del numero de golpes corregido para una eficiencia del 60 % de la energía suministrada por el martillo. El establece que este valor puede ser evaluado como

$$N_{60} = N_{campo} \times C_N \times \frac{E_{campo}}{0,60 \times E_{ff}} \quad (0.11.2)$$

donde:

- ✕ N_{campo} : Es el número de golpes obtenidos en campo
- ✕ E_{campo} : Es la energía del martillo en condiciones reales
- ✕ E_{ff} : Es el valor teórico del martillo (condición ideal de la caída del martillo)
- ✕ C_N : Es un coeficiente que es función del esfuerzo efectivo σ'_0 dado por

$$C_N = \sqrt{\frac{1}{\sigma'_0}} \quad (0.11.3)$$

El profesor A Gonzales en su artículo recomienda que la relación entre la energía de campo y la energía teórica para Colombia se tome como valor de 0.45, por lo cual se puede evaluar el valor N_{60} y por ende calcular los valores del modulo de rigidez del suelo. Estos cálculos son evaluados y entregados en el anexo a este informe. a continuación se presentan los perfiles de modulo de rigidez y perfil de velocidad en función de la profundidad.

Tomando para cada una de las capas en mención se encuentra que los parámetros del suelo para este caso estarán consignados en la siguiente tabla:

| Tipo de suelo | Profundidad | $G_{max} = 325 \times N_{60}^{0,68}$ MPa | E (Mpa) | V (m/s) | K (Mpa/m) |
|---------------|-------------|--|---------|---------|-----------|
| Limo MH | 1 | 43.18 | 107.9 | 154.88 | 12.43 |
| Arcilla CH | 3.20 | 34 | 233 | 234 | 12 |
| Arcilla CH | 6.00 | 12 | 34 | 455 | 14.6 |

Cuadro 3: Propiedades dinámicas de suelos

0.12. Cálculo de confibilidad en parámetros de los suelos

Una de las características importantes a revisar en este proyecto esta relacionada con las propiedades de los suelos, y en especial con su fabrica, esos parametros son los indices de consistencia e indices de liquidez, esto son definidos como:

0.13. CALCULO DE DEFORMACIONES Y ESFUERZOS MÁXIMOS

$$IL = \frac{\% \omega - LP}{IP} \quad (0.12.1)$$

$$IC = \frac{LL - \% \omega}{IP} \quad (0.12.2)$$

para este caso se tomo una muestra representativa de suelos en la cual se valoro estas caracteriticas y posteriormente se ejecuto un analisis de confiabilidad con el fin de evaluar cual es la mejor función de densidad de probabilidad que puede ajustarse a cada parametro. El en caso de este estudio se encontro que para los dos indices se piede evaluar el comportamiento de estas dos propiedades como funciones normales, dando las siguientes caracetristicas:

$$\mu_{IL} = 0,72 \quad (0.12.3)$$

$$\sigma_{IL} = 0.32 \quad (0.12.4)$$

$$\mu_{IC} = 0,41 \quad (0.12.5)$$

$$\sigma_{IC} = 0,25 \quad (0.12.6)$$

dadas que las caracteristicas de los suelos con respecto al IL esta en el intervalo que el material esta en un estado plastico a líquido, y dadas que el IC es inferior a 1 puede indicar un potencial de expansión alto del material debido al alto contenido de material tipo motmorillonitas dentro del mismo, por lo tanto esto corrobora que el material puede experimentar unos asentamientos muy grandes que deben ser tenidos en cuenta en el diseño estructural.

0.13. Calculo de deformaciones y esfuerzos máximos

Con este analisis se encontró con el analisis de elementos finitos, los diagramas de deformaciones y esfuerzos, para esto se condidera una carga maxima de 50KPa, para este analisis se toma la siguiente unidad geotecnica:

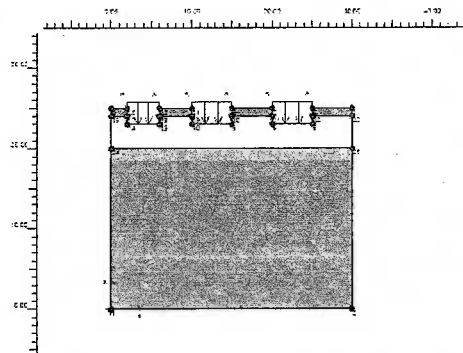


Figura 3: Unidad geotecnica de estudio

0.14. PÁRAMETROS DINAMICOS DEL SUELO

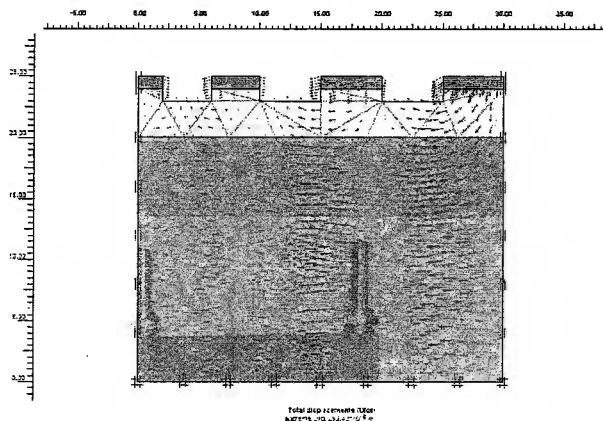


Figura 4: Diagrama de deformaciones del suelo

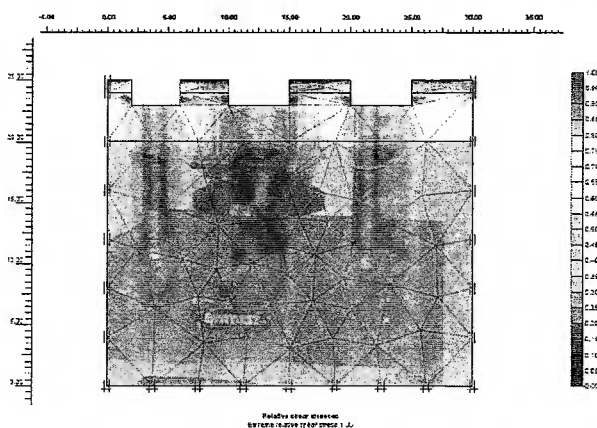


Figura 5: Esfuerzos máximos del suelo

0.14. Párametros dinámicos del suelo

Uno de los parámetros importantes son las curvas de modulo de rigidez y los coeficientes de amortiguamiento del suelo, estos factores se calculan con base en la teoría establecida por el Kramer en su libro *GEOTECHNICAL EARTHQUAKE ENGINEERING* el cual encuentra que la relación de rigidez esta dado en función los indices de plasticidad y los esfuerzos efectivos medios, y los cuales se evalúan como:

$$\frac{G}{G_{max}} = K(\gamma, IP) \times (\sigma'_m)^{m(\gamma, IP) - m_0} \quad (0.14.1)$$

$$m(\gamma, IP) - m_0 = 0,272 \times \left\{ 1 - \tanh\left[\ln\left(\frac{0,000556}{\gamma}\right)^{0,4}\right]\right\} \times e^{-0,0145IP^{1,3}} \quad (0.14.2)$$

0.14. PARÁMETROS DINAMICOS DEL SUELO

$$K(\gamma, IP)_{888} = 0,5 \times \left\{ 1 + \tanh \left[\ln \left(\frac{0,000102 + n(PI)}{\gamma} \right)^{0,492} \right] \right\} \quad (0.14.3)$$

$$n(PI) = 7,0 \times 10^{-7} IP^{1,976} \quad (0.14.4)$$

Las curvas para los dos tipos de suelos para la calibración de un modelo para respuesta local se indican a continuación:

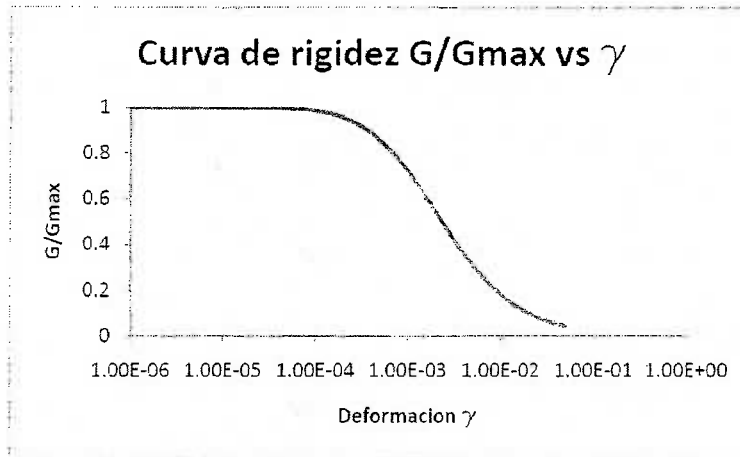


Figura 6: Comportamiento dinámico de la capa 1

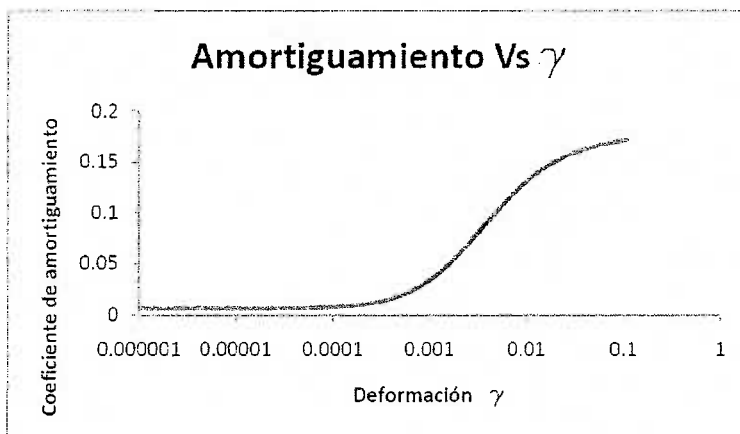


Figura 7: Comportamiento de amortiguamiento

0.15. INTERACCIÓN SUELO ESTRUCTURA

0.15. Interacción suelo estructura

Para el análisis de esto se considera un modulo de reacción del suelo dada por la aproximación de vesic la cual la establece la siguiente ecuación

$$K = \frac{1}{2} \times \frac{E}{1 - \nu^2} \quad (0.15.1)$$

Por otro lado el análisis de compatibilidad angular para cualquier nodo "i" define las condiciones de momento para el análisis de cargas, y el análisis de equilibrio establece las condiciones para resolver el sistema de análisis de interacción suelo estructura, estas ecuaciones se indican a continuación:

$$M_{i-1} + 2M_i \times \left[1 + \frac{L_j}{L_{j-1}}\right] + \left[\frac{L_j}{L_{j-1}} M_{i+1}\right] = \frac{6EJ}{L_{j-1}^2 K_i} \left[\frac{K_i}{K_{i-1}} q_{i-1} - \left(1 + \frac{L_{j-1}}{L_j}\right) q_i + \left(\frac{L_{j-1}}{L_j}\right) \left(\frac{K_i}{K_{i-1}}\right) q_{i-1} \right] \quad (0.15.2)$$

$$\frac{M_{i-1} - M_i}{L_{j-1}} + \frac{M_{i+1} - M_i}{L_j} = P_i - Q_i \quad (0.15.3)$$

Para este caso se considera que el modulo de reacción en el suelo es constante y la distretización también, dadas estas condiciones del suelo se puede establecer que para este caso K sera del orden de (12.43) MPa

0.16. Asentamientos del elemento objeto de estudio

Para este sistema objeto de estudio se considera los asentamientos como la suma de unos asentamientos iniciales y otros secundarios, la expresión dada para esto esta definida como:

$$s_c = C_r \frac{H_o}{1 + e_o} \log \left(\frac{\sigma'_p}{\sigma'_{vo}} \right) + C_c \frac{H_o}{1 + e_o} \log \left(\frac{\sigma'_{vo} + \Delta\sigma_v}{\sigma'_p} \right) \quad (0.16.1)$$

Donde:

- ✕ σ'_p : Esfuerzo de preconsolidación.
- ✕ σ'_{vo} : Esfuerzo vertical efectivo.
- ✕ $\Delta\sigma_v$: Sobre esfuerzo debido a la sobrecarga.
- ✕ H_o : Espesor de la capa consolidable.
- ✕ C_r : Indice de recompresión.
- ✕ C_c : Indice de compresión.

Para el calculo de los esfuerzos externos se considera una presión externa de contacto de 100 KPa, lo cual es suministrado por el peso propio de las losas y el tirante de agua, por lo tanto el calculo del incremento se esfuerzo se hace por la teoria de Newmark para una esquina, la cual tieneun valor de

$$\Delta\sigma_v = \frac{60(dx dy)z^3}{2\pi(x^2 + y^2 + z^2)^{5/2}} = 20I_o \quad (0.16.2)$$

Las siguientes graficas indican el calculo de asentamientos tanto inmediatos como por consolidación:

0.16. ASENTAMIENTOS DEL ELEMENTO OBJETO DE ESTUDIO

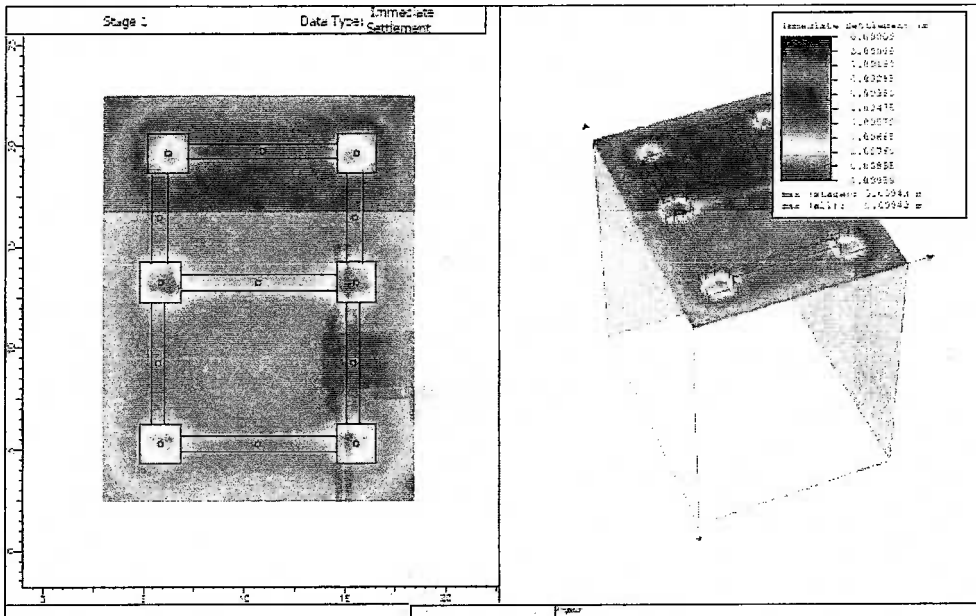


Figura 8: Asentamientos inmediatos

0.17. FACTORES DE SEGURIDAD

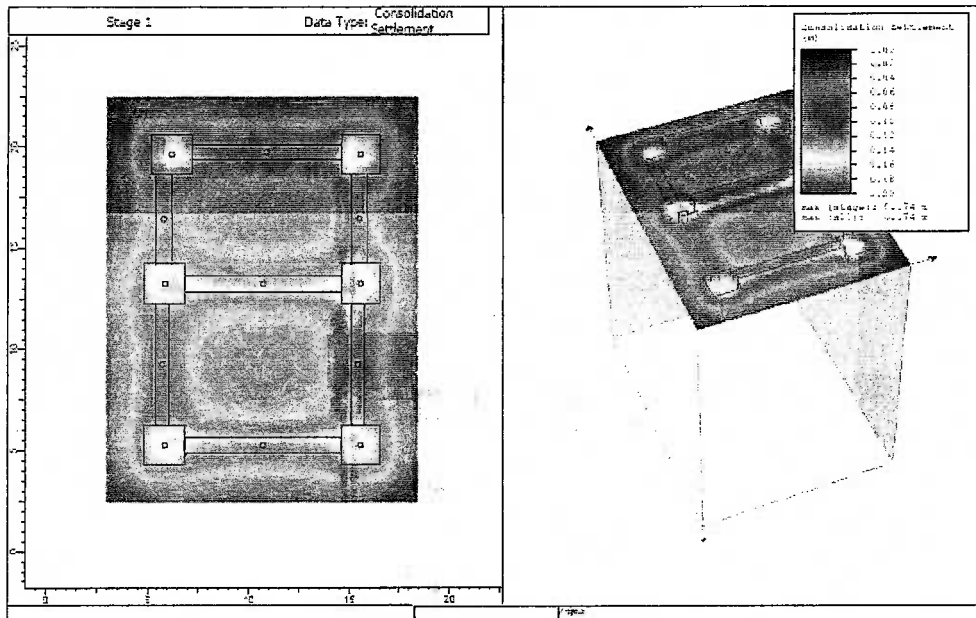


Figura 9: Asentamientos por consolidación

Para este caso se puede evidenciar que los asentamientos esperados son:

- ✦ Asentamientos por consolidación 3.0 cm
- ✦ Asentamientos Inmediatos: 1.0 cm

0.17. Factores de seguridad

Para el proyecto en emención se trabaja con los factores de seguridad indirectos establecidos según la tabla H.4.7-1 y presentada a continuación:

| Condición | Factor de seguridad |
|---|---------------------|
| Carga muerta + carga viva normal | 3.0 |
| carga muerta + carga viva máxima | 2.5 |
| Carga muerta + carga viva normal + sismo de diseño estático | 1.5 |

Cuadro 4: Factores de seguridad

Parte VIII

**CONCLUSIONES Y
RECOMENDACIONES**

0.18. *CONCLUSIONES:*

0.18. Conclusiones:

1. Los mantos de arcilla presentan una consistencia media a firme, en consecuencia se debe hacer un mejoramiento del suelo de fundación
2. Se encontro nivel freatico entre 2.20 y 2.62 metros de profundidad, este puede subir con el incremento de periodo de lluvias.

0.19. Recomendaciones para el diseño de la fundacion.

1. Todos los analisis encontrados en este estudio se basan en una exploración, en caso de encontrar una estratigrafia diferente se debe informar inmediatamente para hacer los ajustes necesarios.
2. Antes de iniciar excavaciones se recomienda verificar el estado estructural de las viviendas vecinas, si estas presentan agrietamientos o hundimientos se debe dejar constancia por escrito ante testigos con el fin de evitar posteriores conflictos.
3. Importante y prioritario tomar las medidas necesarias a fin de evitar el debilitamiento de las cimentaciones vecinas, en caso de observar agrietamientos o hundimientos se debe construir pantallas protectoras de estas cimentaciones.
4. El calculista estructural deberá suministrar a esta consultoría el listado de cargas de cimentación resultantes de los diseños para revisar los factores de seguridad de acuerdo a lo establecido en el Reglamento Colombiano de Construcción Sismo Resistente NSR-10, título H.2.4. Los listados de cargas a suministrar serán los correspondientes a las siguientes condiciones de análisis de la estructura: 1) Carga Muerta + Carga Viva Normal, 2) Carga Muerta + Carga Viva Máxima, y, 3) Carga Muerta + Carga Viva Normal + Sismo de Diseño Seudo Estático aplicado para un $R=1$ en alguno de los dos sentidos; estas combinaciones de carga son, respectivamente, (B.2.3.7), (B.2.3.2) y (B.2.3.8) del numeral B.2.3.1 de la NSR-10.
5. Se debera considerar minimo un recubrimiento de 7 cm dentro del diseño del elemento para el refuerzo.
6. Todos los concretos de la cimentacion deberá tener minimo una resistencia de 39 Mr.
7. La capacidad portante del suelo para este proyecto es de 82.0 KPa o 8.20 ton/m² a un nivel de fundación de - 3.80 m con un mejoramiento del suelo.
8. ESTRUCTURA DE CIMENTACION. Desde el nivel de cimentacion (-3.80 metros) a partir del nivel del nivel del suelos actual o (-1.80 metros) a partir del nivel del sotano se construira una losa de cimentación combinada con pilotes pre excavados con una capacidad portante de 8.20 ton/m², con un porcentaje del 60 % de la carga y sobre los pilotes se utilizara el restante 40 %. Se anexa cuadro de pilotes donde se indican diferentes diametros y cargas para varias profundidades. El calculista determinara el diametro y la profundidad de los pilotes para las cargas calculadas.
9. Los asentamientos a corto plazo esperados son del orden de 7.0 cm y los asentamientos a largo plazo don del orden de 3.0 cm. Los asentamiento finales esperados son del orden de 10 cm total, después de evaluados usando como cimentación losa pilote. Se estima que los asentamientos para la cimentación combinada disminuyen un 50 %. Las profundidades de los pilotes no pueden ser inferiores a 15 m.

0.20. RECOMENDACIONES PARA LA CONSTRUCCION

10. Como recomendaciones para las excavaciones vecinas tenemos; Realizar las excavaciones en el menor tiempo posible, realizando las excavaciones de los pilotes antes de las excavaciones para la placa de primer piso. Se deben manejar filtros verticales y debajo de la placa de sótano en forma de espina de pescado para evitar que se presenten problemas a futuro con el nivel freático en este sitio. Se debe tomar las medidas necesarias para evitar que se alteren la cimentaciones de los predios vecinos, en caso de observar alteraciones se debe submurar estos cimientos.
11. Se debe realizar el control de asentamientos por medio de niveletas y testigos en los muros de las construcciones existentes. Se deben construir los muros de contención por tramos de 6 m, los cuales se fundaran sobre la losa de cimentación.
12. Las dimensiones finales de la cimentación las determina el ingeniero estructural dependiendo del análisis de cargas efectuado para la edificación.
13. Las características del concreto y cuantía de refuerzo a utilizar seran a criterio del ingeniero estructural

0.20. Recomendaciones para la construcción

1. Las excavaciones para la construcción de los cimientos pueden ser realizadas a cielo abierto bien sea con herramienta manual o con equipo mecánico, teniendo en cuenta las precauciones necesarias, como por ejemplo si se presentan desprendimientos de suelo, realizar un revestimiento en concreto lanzado para evitar este problema.
2. En el caso de proyectar excavaciones contiguas a construcciones adyacentes se ejecutarán en talud vertical y se deberán entibar para evitar la afectación de la estabilidad en dichas construcciones, de no ser posible está alternativa se recomienda submurar las cimentaciones vecinas.
3. En el caso de ocurrencia de lluvias durante las excavaciones se debe tapar con plástico las mismas con el fin de evitar que se deposite agua en las excavaciones, evitando así el uso de sistemas de bombeo y el reblandecimiento del suelo de fundación.
4. El Recebo granular o suelo cemento y demás materiales de relleno utilizados en el proyecto deben ser compactados en capas de 0.20 m. El recebo granular se compactará hasta obtener el 95 % de la densidad óptima del ensayo Proctor Modificado; para el suelo cemento el porcentaje de compactación será del 98 % del Proctor estándar.
5. El concreto utilizado sera el concreto de planta con una especificación minima de 39 Mr, los cuales deberean cumplir las especificaciones de la NSR-10 capitulo C durabilidad y puesta en obra
6. Todo tipo de excavación debera ejecutarse con un talud cuyas proporciones esten en 3/2 H:V debido a la cohesión del suelo y evitar daños y derrumbes del material, sin embargo se debe entibar y apuntalar todo tipo de excavación que se haga con el fin de evitar daños colaterales.
7. No se deberá acudir al uso de sistemas de excavación que pudieran dañar excesivamente el terreno adyacente. Durante la ejecución de los trabajos se tomarán, en todos los casos, las precauciones adecuadas para no disminuir la resistencia o estabilidad del terreno no excavado. En especial, se atenderá a las características tectónico-estructurales del entorno y a las alteraciones de su drenaje y se adoptarán las medidas necesarias para evitar fenómenos como inestabilidad de taludes en roca o de bloques de la misma, debida a voladuras inadecuadas; deslizamientos ocasionados por el descalce del pie de la excavación; encharcamientos debidos a un drenaje defectuoso de las obras o taludes provisionales excesivos.

0.20. RECOMENDACIONES PARA LA CONSTRUCCION

8. La secuencia de todas las operaciones de excavación debe ser tal, que asegure la utilización de todos los materiales aptos y necesarios para la construcción de las obras señaladas en los planos del proyecto o indicadas por el Interventor.
9. La excavación de la explanación se deberá ejecutar de acuerdo con las secciones transversales del proyecto o las modificadas por el Interventor. Toda sobre-excavación que haga el Constructor, por negligencia o por conveniencia propia para la operación de sus equipos, correrá por su cuenta y el Interventor podrá suspenderla, si lo estima necesario, por razones técnicas o económicas.
10. Cualquier daño no previsto a una estructura o construcción existente causado por la ejecución de los trabajos de excavación deberá ser asumido por el Constructor, quién deberá reponer el bien a entera satisfacción de su propietario.
11. Se debera impermeabilizar todo el concreto para evitar daños por carbonatación y oxidacion del acero
12. Con respecto a los equipos deberán ser compatibles con los procedimientos de construcción adoptados y requieren la aprobación previa del Interventor, teniendo en cuenta que su capacidad y eficiencia se ajusten al programa de ejecución de las obras y al cabal cumplimiento de las exigencias de la presente especificación y de la correspondiente partida de trabajo.
13. El contratista debera presentar un informe detallado al terminar de fundir cada zapata, donde se presente, el perfil de suelo encontrado, volumen de concreto utilizado, tiempo de excavación, tiempo de carga e imprevistos.
14. Todos los materiales a utilizar deberan cumplir las especificaciones dadas por la NSR-10 y norma invias

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1. Análisis de capacidad portante para cimientos superficiales.

Con el fin de determinar la resistencia límite del medio de fundación, fueron llevados a cabo los análisis de capacidad portante del estrato de soporte para el tipo de cimentación evaluada usando la ecuación general de Capacidad Portante Admisible que emplea los mecanismos de falla de Prandtl modificada con los factores de capacidad portante, de corrección por forma, de profundidad de desplante de la cimentación, y de inclinación de carga, establecidos por Meyerhof (1963), usando sobre este valor último de soporte un factor de seguridad de 3.0.

De acuerdo a la profundidad de emplazamiento y ancho de los cimientos, dentro de los tres tipos de cimentación se definió la siguiente:

Superficiales D/B = menor a 4
Tipo de cimentación = zapatas aisladas o cimientos corridos

D = profundidad de desplante de la cimentación

B = ancho del cimiento

La capacidad portante del suelo en el nivel de cimentación se estimó utilizando la teoría expuesta por Meyerhof (1963) donde:

Para carga vertical:

$$q_{ult} = cN_c s_c d_c + \bar{q}N_q s_q d_q + 0.5\gamma B'N_\gamma s_\gamma d_\gamma$$

Para carga vertical:

$$q_{ult} = cN_c s_c i_c + \bar{q}N_q s_q i_q + 0.5\gamma B'N_\gamma s_\gamma i_\gamma$$

En esta ecuación:

B' = ancho de la cimentación (diámetro para una cimentación circular)

c = cohesión

\bar{q} = esfuerzo efectivo al nivel de desplante de la cimentación.

γ = peso específico del suelo

N_c, N_q, N_γ = Factores de capacidad de carga,

s_i, d_i, i_i = Factores de corrección por forma, profundidad e inclinación.

Factores de capacidad de carga:

$$N_q = e^{\pi \tan \varphi} \tan^2(45 + \varphi/2)$$

$$N_c = (N_q - 1) \cot \varphi$$

$$N_\gamma = (N_q - 1) \tan 1.4\varphi$$

$$K_p = \tan^2(45 + \varphi/2)$$

Factores por forma:

$$s_c = 1 + 0.2K_p \frac{B}{L}$$

Para todo φ

$$s_q = s_\gamma = 1 + 0.1K_p \frac{B}{L}$$

$\varphi > 10$

$$s_q = s_\gamma = 1$$

$\varphi = 10$

Factores de profundidad:

$$d_c = 1 + 0.2\sqrt{K_p} \frac{D}{B}$$

Para todo φ

$$s_q = s_\gamma = 1 + 0.1\sqrt{K_p} \frac{D}{B}$$

$\varphi > 10$

$$s_q = s_\gamma = 1$$

$\varphi = 10$

Factores de inclinación:

$$i_c = i_q = \left(1 - \frac{\theta}{90^\circ}\right)^2$$

Para todo φ

$$i_\gamma = \left(1 - \frac{\theta}{\varphi}\right)^2$$

$\varphi > 0$

$$i_\gamma = 1$$

$\theta > 0$ and $\varphi = 0$

Considerando la incidencia de la geometría de la fundación y la profundidad de desplante se llevó a cabo un análisis de sensibilidad en el cual se contemplaron diferentes dimensiones de cimiento y relaciones ancho/largo (B/L), para diferentes niveles de fundación.

Este análisis permitió establecer que la capacidad portante de servicio para la estructura es variable, dependiendo de su geometría y del suelo de fundación. A continuación se presenta la ecuación de capacidad utilizada con los factores por corrección:

$$q_{adm} = \frac{q_{ult} - \sigma'_v}{F.S.} + \sigma'_v$$

Donde:

q_{adm} = Carga admisible para la fundación al nivel de desplante.

q_{ult} = capacidad ultima.

σ'_v = esfuerzo vertical efectivo al nivel de desplante.

$F.S.$ = factor de seguridad.

2. Análisis de asentamientos para zapatas y/o cimientos corridos

Para el cálculo de asentamientos se utiliza la siguiente metodología ya que es necesario estimarlos con precisión porque la mayoría de las estructuras son más sensibles a los asentamientos rápidos de distorsión que a los lentos. La ecuación utilizada para el cálculo de asentamientos inmediatos es la siguiente:

$$\Delta H = q_0 B' \frac{1 - \mu^2}{E_s} m I_s I_F$$

En donde E_s, μ son los parámetros elásticos del suelo y I_s, I_F, m son los factores de influencia de Steinbrenner, Fox, y números de esquinas que contribuyen al asentamiento. Para el caso de la estimación del asentamiento producido por una cimentación rígida se trabajará con el 93% de I_s .

Cada uno de los asentamientos está calculado por carga rígida y por carga flexible. En la hoja de cálculo se detalla la teoría aplicada y los cálculos realizados teniendo en cuenta modulo de Young, Coeficiente de Poisson y la carga admisible calculada con anterioridad.

3. Modelo de cálculo para la susceptibilidad a la licuefacción

La licuefacción es el fenómeno por el cual se generan excesos súbitos de presión de poros en la masa de suelo generalmente cuando este es sometido a cargas cíclicas presentándose un detrimento de su capacidad portante. Generalmente este fenómeno es relacionado con suelos granulares. Existen diversas metodologías para evaluar la susceptibilidad de licuefacción. Para el análisis se usará la metodología propuesta por Seed and Idriss (1971) en la cual se relaciona el número de golpes del ensayo SPT con esta susceptibilidad.

Para evaluar el potencial de licuación del suelo de fundación se tomará como indicativo de esta susceptibilidad la densidad relativa de los estratos suprayacentes y el número de golpes N encontrado para cada estrato.

En general suelos con densidades relativas superiores al 80% son difícilmente licuables mientras que los que presentan valores inferiores al 50% son peligrosos. Adicionalmente los suelos con gradación uniforme son mas susceptibles que aquellos mal gradados, al tiempo que los suelos gruesos son menos susceptibles que los finos teniendo en cuenta que las arcillas presentan un potencial casi nulo. De igual manera el potencial aumenta si el nivel freático se encuentra cerca al nivel de desplante durante la mayoría del año.

Entre mayor sea la consistencia tenderá a presentar menor susceptibilidad a la licuefacción. Como guía en la evaluación de la consistencia se tomará la tabla siguiente.

| N | CONSISTENCIA | Dr(%) |
|-------|--------------|---------|
| 2 | MUY BLANDA | <15 |
| 2-4 | BLANDA | 15 – 30 |
| 4-8 | MEDIA | 30 – 45 |
| 8-15 | MEDIA DURA | 45 – 60 |
| 15-30 | DURA | 60 – 80 |
| 30 | MUY DURA | >80 |

La metodología parte de la relación Cyclic Stress Ratio (CSR) de la siguiente forma:

$$CSR = 0.65 \frac{\dot{a}_{m\acute{a}x}}{g} \frac{\sigma_{vo}}{\sigma'_{vo}} r_d$$

En la cual,

$a_{m\acute{a}x}$ = Aceleración pico del sismo.

σ_{vo} = Esfuerzo total antes del sismo.

σ'_{vo} = Esfuerzo efectivo antes del sismo.

g = Aceleración de la gravedad

r_d = Coeficiente de reducción de esfuerzo.

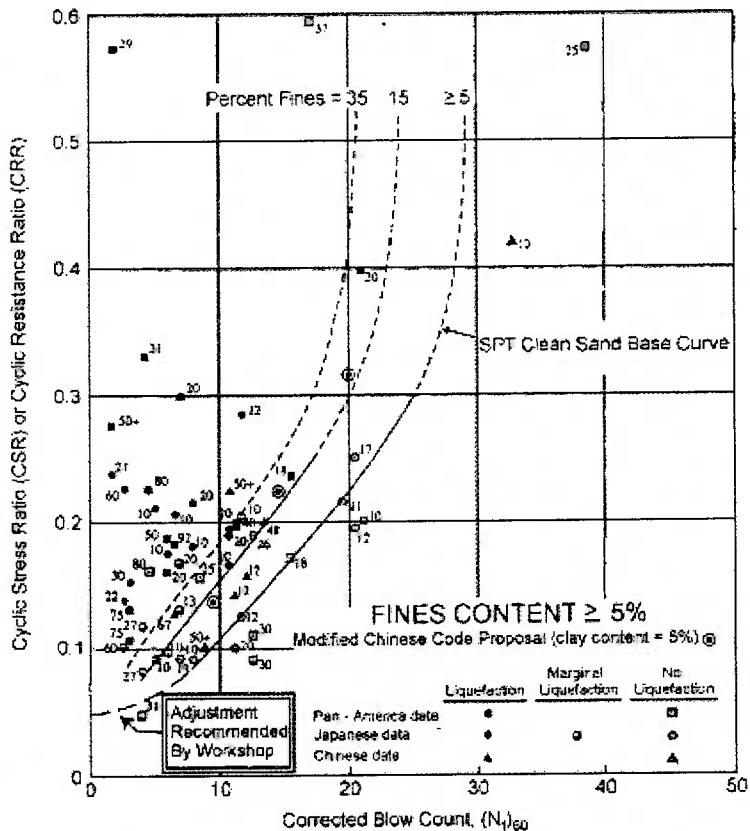
Para la obtención del coeficiente de reducción se recomienda usar la siguiente fórmula:

$$r_d = 1.0 - (0.00767)z \quad z \leq 15m$$

$$r_d = 1.174 - (0.00267)z \quad 15m < z \leq 23m$$

Para estimar cuantitativamente el potencial de licuefacción se debe obtener como parámetro del suelo la resistencia del suelo a cargas cíclicas a las que este se verá sometido durante la vida útil de las estructuras que soporta. Este parámetro es la relación Cyclic Resistance Ratio. Por lo tanto para fines conceptuales el CSR es la demanda sobre el suelo y CRR es la resistencia de este.

Para la metodología seguida en este informe, se trabajara con la figura siguiente (Youd et al., 2001), donde se relaciona CRR para un sismo de magnitud 7.5 con el parámetro del suelo $(N_1)_{60}$ obtenido por el SPT.



De esta manera, se definirá el factor de seguridad para la licuefacción como:

$$F.S.liq = \frac{CRR_{7.5}}{CSR} MFS$$

Para nuestro análisis se trabajará con $MFS = 1.0$.

Para la metodología de análisis seguida en este informe se supondrá dos casos (1) el nivel freático se encuentra a nivel superficial, (2) nivel freático al nivel de desplante de la cimentación.

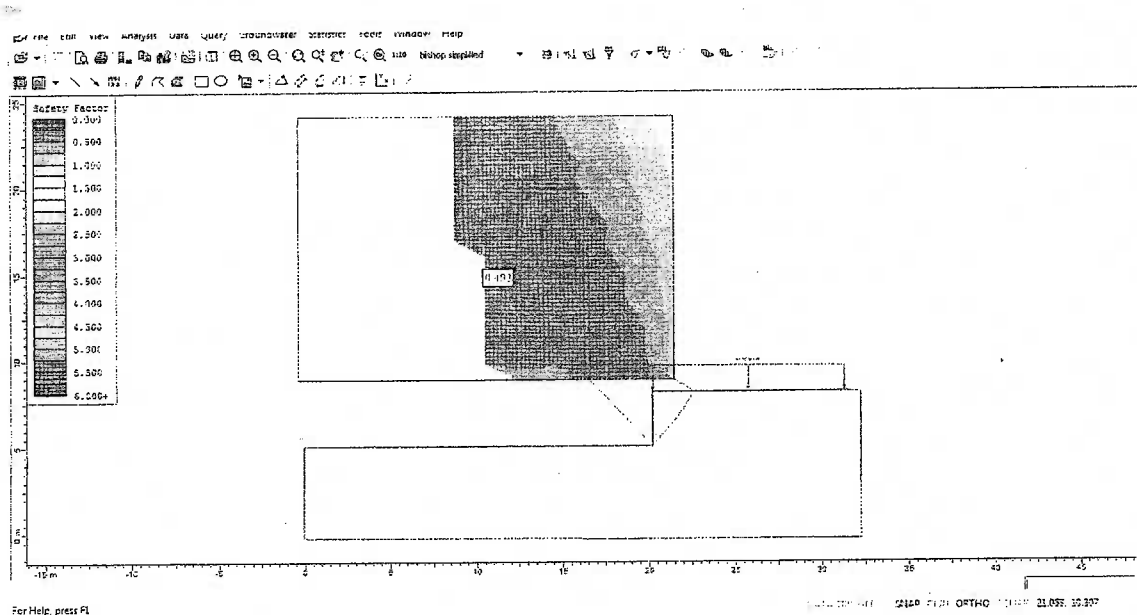
Criterios (modificado de Youd et al., 2001):

- La probabilidad de licuación así calculada será menor al 10% si el factor de seguridad a la licuefacción es igual o mayor a 1.5

- La probabilidad de licuación así calculada será menor al 20% si el factor de seguridad a la licuefacción es igual o mayor a 1.0
- Para suelos finos no se tendrá en cuenta este análisis y se supondrá que estos materiales no son susceptibles es decir, que no son licuables.

ANALISIS DE ESTABILIDAD DE TALUDES

Se realiza el análisis de estabilidad de taludes, considerando los parámetros de los materiales y las dimensiones de las excavaciones de las construcciones vecinas. Se realiza el análisis de estabilidad de taludes en donde se observa que se requiere la construcción de muros de contención en concreto.



Se debe utilizar una losa de cimentación en concreto reforzado sobre una capa de recebo seleccionado de 0.50 m, en donde se construirá el filtro del fondo del semisótano.

Part IX
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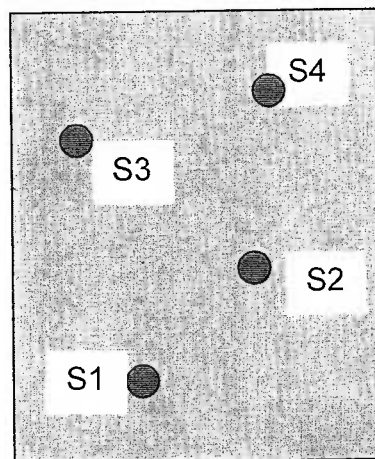
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Part X

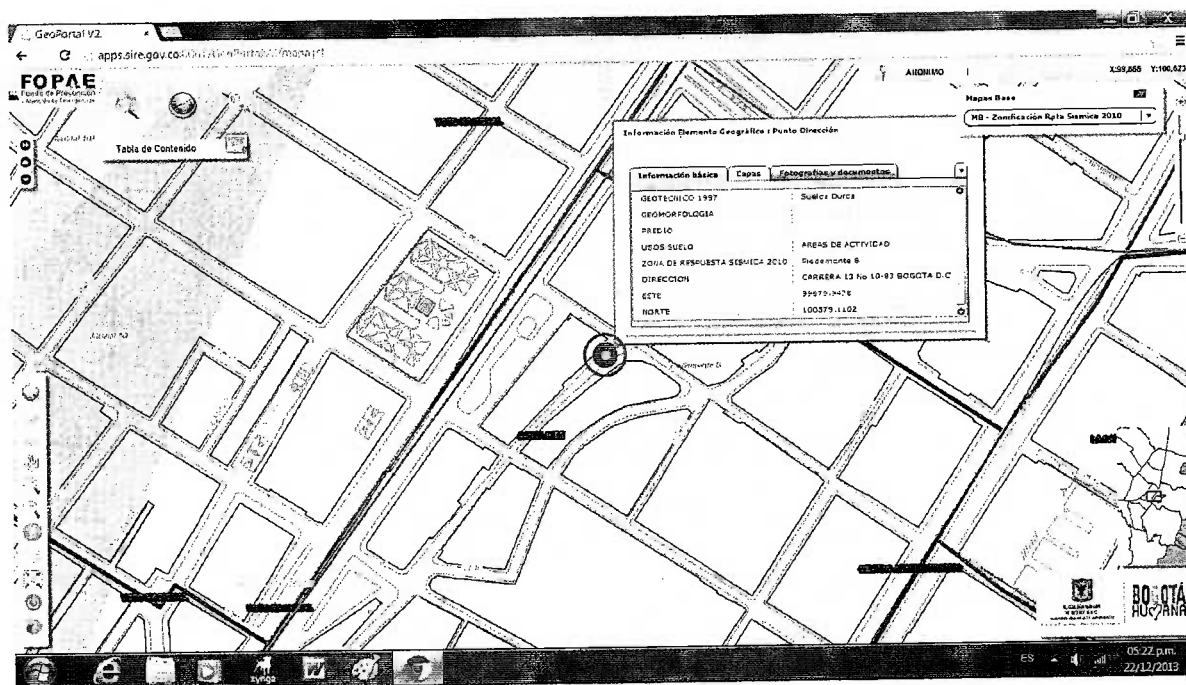
**PERFILES ESTRATIGRAFICOS Y
REGISTRO FOTOGRAFICO**

CARRERA 13 No 10-83/85/91 BOGOTA

ESQUEMA DE LOCALIZACION DE SONDEOS.



PLANO DE LOCALIZACION DEL PREDIO TOMADO DEL FOPAE



EXPLORACION EN EL TERRENO

| | |
|---|-----------------------------|
| PROYECTO: EDIFICIO 6 PISOS Y SOTANO | CIUDAD: BOGOTA D.C. |
| SONDEO No. 1 (UNO) | INGENIERO: JOSE MARIA MICAN |
| NIVEL FREATICO: A 2.20 METROS | LABORATORISTA: JULIO CARD. |
| LOCALIZACIÓN: CARRERA 13 No 10-83/85/91 | PROFUNDIDAD: 15.10 METROS |

PERFIL ESTRATIGRAFICO

| PROFUNDIDAD | NF | USC PERFIL | DESCRIPCIÓN | %Wn |
|-------------|----|---------------|---|------|
| 0.00 | | | Baldosa y placa en concreto | |
| 0.15 | | MH | Relleno en limos arcilloso mezclados escombros. | 20.3 |
| 0.40 | | MH | Limo arcilloso orgánico color gris con vetas cafés de alta compresibilidad. | 23.6 |
| 1.40 | | CH | Arcilla arenosa en matriz gravosa color habano grisáceo con vetas amarillas de oxidación de humedad y plasticidad media alta. Consistencia media a blanda | 44.5 |
| 5.00 | | CH | Arcilla color gris de humedad y plasticidad media alta. Consistencia blanda. | 52.8 |
| 15.10 | | | Fin del sondeo | |

NOTA: Sin Escala

EXPLORACION EN EL TERRENO

| | |
|---|-----------------------------|
| PROYECTO: EDIFICIO 6 PISOS Y SOTANO | CIUDAD: BOGOTA D.C. |
| SONDEO No. 2 (DOS) | INGENIERO: JOSE MARIA MICAN |
| NIVEL FREATICO: A 2.40 METROS | LABORATORISTA: JULIO CARD. |
| LOCALIZACIÓN: CARRERA 13 No 10-83/85/91 | PROFUNDIDAD: 15.20 METROS |

PERFIL ESTRATIGRAFICO

| PROFUNDIDAD | NF | USC PERFIL | DESCRIPCIÓN | %Wn |
|-------------|-------|---------------|---|------|
| 0.00 | | | | |
| 0.00 | | | Baldosa y placa en concreto | |
| 0.14 | | | | |
| 0.14 | | MH | Relleno en limos arcilloso mezclados escombros. | 22.6 |
| 0.50 | | | | |
| 0.50 | | MH | Limo arcilloso orgánico color gris con vetas cafés de alta compresibilidad. | 26.1 |
| 1.60 | | | | |
| 1.60 | N.F → | CH | Arcilla arenosa en matriz gravosa color habano grisáceo con vetas amarillas de oxidación de humedad y plasticidad media alta. Consistencia media a blanda | 45.8 |
| 5.20 | | | | |
| 5.20 | | CH | Arcilla color gris de humedad y plasticidad media alta. Consistencia blanda. | 60.2 |
| 15.20 | | | | |
| | | | Fin del sondeo | |

NOTA: Sin Escala

EXPLORACION EN EL TERRENO

| | |
|---|-----------------------------|
| PROYECTO: EDIFICIO 6 PISOS Y SOTANO | CIUDAD: BOGOTA D.C. |
| SONDEO No. 3 (TRES) | INGENIERO: JOSE MARIA MICAN |
| NIVEL FREATICO: A 2.50 METROS | LABORATORISTA: JULIO CARD. |
| LOCALIZACIÓN: CARRERA 13 No 10-83/85/91 | PROFUNDIDAD: 15.12 METROS |

PERFIL ESTRATIGRAFICO

| PROFUNDIDAD | NF | USC PERFIL | DESCRIPCIÓN | %Wn |
|-------------|--------|---------------|---|------|
| 0.00 | | | | |
| 0.00 | | | Baldosa y placa en concreto | |
| 0.10 | | | | |
| 0.10 | | MH | Relleno en limos arcilloso mezclados escombros. | 24.5 |
| 0.55 | | | | |
| 0.55 | | MH | Limo arcilloso orgánico color gris con vetas cafés de alta compresibilidad. | 28.6 |
| 1.80 | | | | |
| 1.80 | N.F. → | CH | Arcilla arenosa en matriz gravosa color habano grisáceo con vetas amarillas de oxidación de humedad y plasticidad media alta. Consistencia media a blanda | 46.9 |
| 5.30 | | | | |
| 5.30 | | CH | Arcilla color gris de humedad y plasticidad media alta. Consistencia blanda. | 62.8 |
| 15.12 | | | | |
| | | | Fin del sondeo | |

NOTA: Sin Escala

EXPLORACION EN EL TERRENO

| | |
|---|-----------------------------|
| PROYECTO: EDIFICIO 6 PISOS Y SOTANO | CIUDAD: BOGOTA D.C. |
| SONDEO No. 4 (CUATRO) | INGENIERO: JOSE MARIA MICAN |
| NIVEL FREATICO: A 2.62 METROS | LABORATORISTA: JULIO CARD. |
| LOCALIZACIÓN: CARRERA 13 No 10-83/85/91 | PROFUNDIDAD: 15.60 METROS |

PERFIL ESTRATIGRAFICO

| PROFUNDIDAD | NF | USC PERFIL | DESCRIPCIÓN | %Wn |
|-------------|--------|---------------|---|------|
| 0.00 | | | Baldosa y placa en concreto | |
| 0.12 | | MH | Relleno en limos arcilloso mezclados escombros. | 26.2 |
| 0.60 | | MH | Limo arcilloso orgánico color gris con vetas café de alta compresibilidad. | 25.2 |
| 1.70 | N.F. → | CH | Arcilla arenosa en matriz gravosa color habano grisáceo con vetas amarillas de oxidación de humedad y plasticidad media alta. Consistencia media a blanda | 50.4 |
| 5.28 | | CH | Arcilla color gris de humedad y plasticidad media alta. Consistencia blanda. | 65.6 |
| 15.60 | | | Fin del sondeo | |

NOTA: Sin Escala

INGEOLAB

LABORATORIO DE INGENIERIA CIVIL

ENSAYO DE COMPRESION INCONFINADA

FECHA: MOSQUERA, DICIEMBRE DE 2013
 PROYECTO: EDIFICIO EN 6 PISOS Y SOTANO UBICADO EN LA CARRERA 13 No 10-83/85/91 BOGOTA
 SONDEO: 1 MUESTRA I
 PROFUNDIDAD: 2,25 METROS

DATOS DE LA MUESTRA

| | | | | | |
|---------------|--------------|-----------------|--------------|--------------|--------------------|
| DIAM. INICIAL | <u>4,50</u> | cm | DIAM. FINAL | <u>4,68</u> | cm |
| AREA INICIAL | <u>15,90</u> | cm ² | AREA FINAL | <u>17,20</u> | cm ² |
| ALT. INICIAL | <u>10,00</u> | cm | ALT. FINAL | <u>9,24</u> | cm |
| HUMEDAD | <u>44,50</u> | % | DENS. HUMEDA | <u>1,347</u> | gr/cm ³ |

DESCRIPCION DE LA MUESTRA: Arcilla arenosa en matriz gravosa color habana grisaceo

DATOS DE HUMEDAD

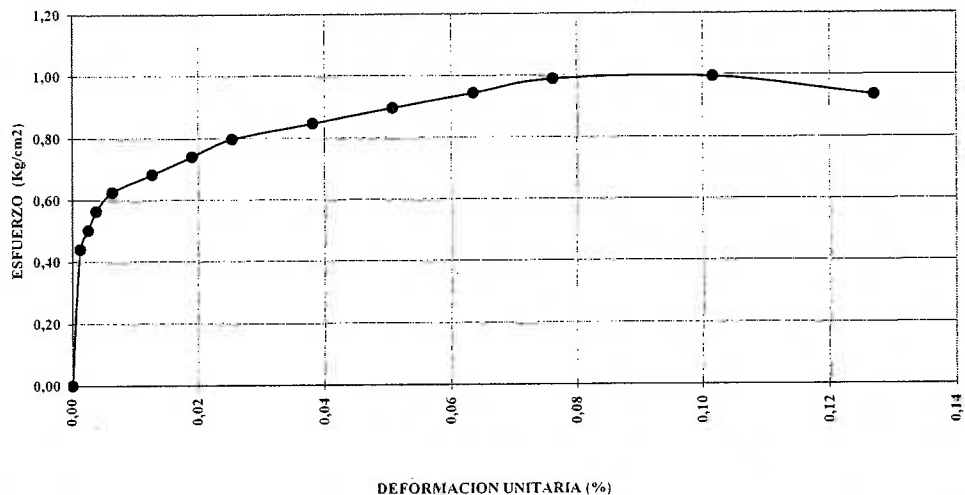
pl 214,20 grs
 wn 44,50 %



ESQUEMA DE FALLA

| LECTURA DEL DEFORMIMETRO (10 ⁻³ plg) | CARGA APLICADA KG | DEFORMACION DE LA MUESTRA (mm) | DEFORMACION UNITARIA (10 ⁻²) | AREA CORREGIDA (cm ²) | DEFORMACION UNITARIA % | ESFUERZO SOBRE LA MUESTRA (Kg/cm ²) |
|---|-------------------|--------------------------------|--|-----------------------------------|------------------------|---|
| 0,00 | 0,00 | 0,00000 | 0,00000 | 15,90000 | 0,00000 | 0,00000 |
| 5,00 | 7,00 | 0,12700 | 0,00127 | 15,92022 | 0,12700 | 0,43969 |
| 10,00 | 8,00 | 0,25400 | 0,00254 | 15,94049 | 0,25400 | 0,50187 |
| 15,00 | 9,00 | 0,38100 | 0,00381 | 15,96081 | 0,38100 | 0,56388 |
| 25,00 | 10,00 | 0,63500 | 0,00635 | 16,00161 | 0,63500 | 0,62494 |
| 50,00 | 11,00 | 1,27000 | 0,01270 | 16,10453 | 1,27000 | 0,68304 |
| 75,00 | 12,00 | 1,90500 | 0,01905 | 16,20878 | 1,90500 | 0,74034 |
| 100,00 | 13,00 | 2,54000 | 0,02540 | 16,31439 | 2,54000 | 0,79684 |
| 150,00 | 14,00 | 3,81000 | 0,03810 | 16,52978 | 3,81000 | 0,84696 |
| 200,00 | 15,00 | 5,08000 | 0,05080 | 16,75095 | 5,08000 | 0,89547 |
| 250,00 | 16,00 | 6,35000 | 0,06350 | 16,97811 | 6,35000 | 0,94239 |
| 300,00 | 17,00 | 7,62000 | 0,07620 | 17,21152 | 7,62000 | 0,98771 |
| 400,00 | 17,60 | 10,16000 | 0,10160 | 17,69813 | 10,16000 | 0,99446 |
| 500,00 | 17,00 | 12,70000 | 0,12700 | 18,21306 | 12,70000 | 0,93340 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

COMPRESION INCONFINADA



qu(kg/cm²) 0,99

cu(kg/cm²) 0,50

INGEOLAB

LABORATORIO DE INGENIERIA CIVIL

ENSAYO DE COMPRESION INCONFINADA

FECHA: MOSQUERA, DICIEMBRE DE 2013
 PROYECTO: EDIFICIO EN 6 PISOS Y SOTANO UBICADO EN LA CARRERA 13 No 10-83/85/91 BOGOTA
 SONDEO: 2 MUESTRA I
 PROFUNDIDAD: 2,00 METROS

DATOS DE LA MUESTRA

| | | | | | |
|---------------|--------------|-----------------|--------------|--------------|--------------------|
| DIAM. INICIAL | <u>4,50</u> | cm | DIAM. FINAL | <u>4,68</u> | cm |
| AREA INICIAL | <u>15,90</u> | cm ² | AREA FINAL | <u>17,20</u> | cm ² |
| ALT. INICIAL | <u>10,00</u> | cm | ALT. FINAL | <u>9,24</u> | cm |
| HUMEDAD | <u>44,50</u> | % | DENS. HUMEDA | <u>1,359</u> | gr/cm ³ |

DESCRIPCION DE LA MUESTRA : Arcilla arenosa en matriz gravosa color habana grisaceo

DATOS DE HUMEDAD

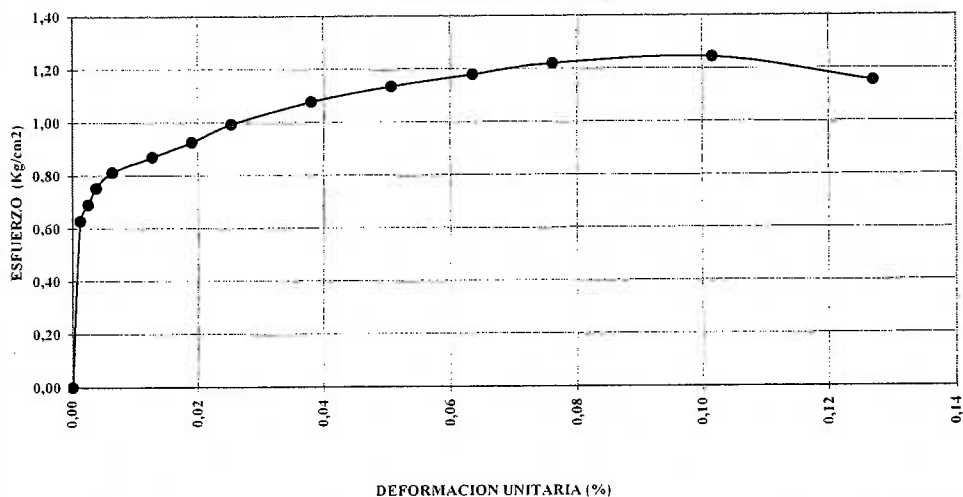
pl 216,20 grs
 wn 44,50 %



ESQUEMA DE FALLA

| LECTURA DEL DEFORMIMETRO (10 ⁻³ plg) | CARGA APLICADA KG | DEFORMACION DE LA MUESTRA (mm) | DEFORMACION UNITARIA (10 ⁻²) | AREA CORREGIDA (cm ²) | DEFORMACION UNITARIA % | ESFUERZO SOBRE LA MUESTRA (Kg/cm ²) |
|---|-------------------|--------------------------------|--|-----------------------------------|------------------------|---|
| 0,00 | 0,00 | 0,00000 | 0,00000 | 15,90000 | 0,00000 | 0,00000 |
| 5,00 | 10,00 | 0,12700 | 0,00127 | 15,92022 | 0,12700 | 0,62813 |
| 10,00 | 11,00 | 0,25400 | 0,00254 | 15,94049 | 0,25400 | 0,69007 |
| 15,00 | 12,00 | 0,38100 | 0,00381 | 15,96081 | 0,38100 | 0,75184 |
| 25,00 | 13,00 | 0,63500 | 0,00635 | 16,00161 | 0,63500 | 0,81242 |
| 50,00 | 14,00 | 1,27000 | 0,01270 | 16,10453 | 1,27000 | 0,86932 |
| 75,00 | 15,00 | 1,90500 | 0,01905 | 16,20878 | 1,90500 | 0,92542 |
| 100,00 | 16,20 | 2,54000 | 0,02540 | 16,31439 | 2,54000 | 0,99299 |
| 150,00 | 17,80 | 3,81000 | 0,03810 | 16,52978 | 3,81000 | 1,07684 |
| 200,00 | 19,00 | 5,08000 | 0,05080 | 16,75095 | 5,08000 | 1,13426 |
| 250,00 | 20,00 | 6,35000 | 0,06350 | 16,97811 | 6,35000 | 1,17799 |
| 300,00 | 21,00 | 7,62000 | 0,07620 | 17,21152 | 7,62000 | 1,22011 |
| 400,00 | 22,00 | 10,16000 | 0,10160 | 17,69813 | 10,16000 | 1,24307 |
| 500,00 | 21,00 | 12,70000 | 0,12700 | 18,21306 | 12,70000 | 1,15302 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

COMPRESION INCONFINADA



qu(kg/cm2) 1,24

cu(kg/cm2) 0,62

INGEOLAB

LABORATORIO DE INGENIERIA CIVIL

ENSAYO DE COMPRESION INCONFINADA

FECHA MOSQUERA, DICIEMBRE DE 2013
 PROYECTO EDIFICIO EN 6 PISOS Y SOTANO UBICADO EN LA CARRERA 13 No 10-83/85/91 BOGOTA
 SONDEO 3 MUESTRA 1
 PROFUNDIDAD 3,00 METROS

DATOS DE LA MUESTRA

| | |
|---|--|
| DIAM. INICIAL <u>4,50</u> cm | DIAM. FINAL <u>4,68</u> cm |
| AREA INICIAL <u>15,90</u> cm ² | AREA FINAL <u>17,20</u> cm ² |
| ALT. INICIAL <u>10,00</u> cm | ALT. FINAL <u>9,24</u> cm |
| HUMEDAD <u>44,50</u> % | DENS. HUMEDA <u>1,335</u> gr/cm ³ |

DESCRIPCION DE LA MUESTRA : Arcilla arenosa en matriz gravosa color habana grisacsea

DATOS DE HUMEDAD

p1 212,30 grs

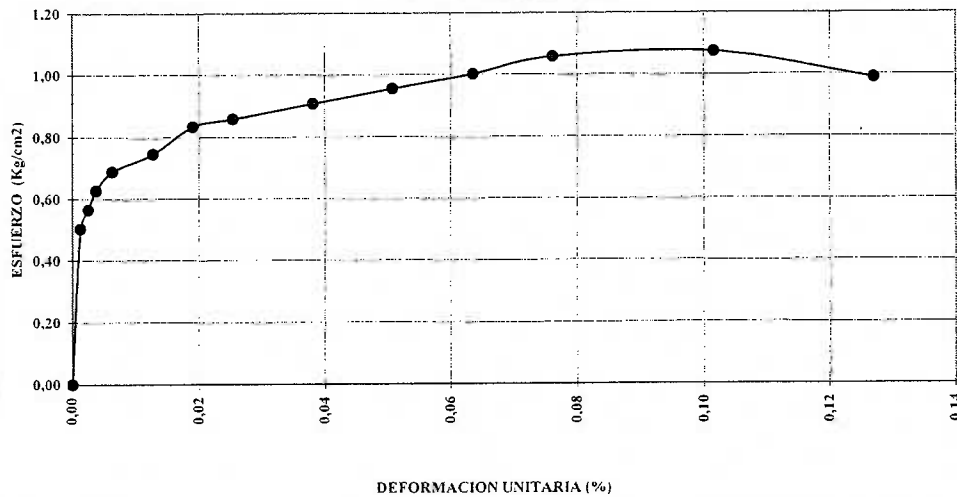
wn 44,50 %



ESQUEMA DE FALLA

| LECTURA DEL DEFORMIMETRO (10 ⁻³ plg) | CARGA APLICADA KG | DEFORMACION DE LA MUESTRA (mm) | DEFORMACION UNITARIA (10 ⁻²) | AREA CORREGIDA (cm ²) | DEFORMACION UNITARIA % | ESFUERZO SOBRE LA MUESTRA (Kg/cm ²) |
|---|-------------------|--------------------------------|--|-----------------------------------|------------------------|---|
| 0,00 | 0,00 | 0,00000 | 0,00000 | 15,90000 | 0,00000 | 0,00000 |
| 5,00 | 8,00 | 0,12700 | 0,00127 | 15,92022 | 0,12700 | 0,50251 |
| 10,00 | 9,00 | 0,25400 | 0,00254 | 15,94049 | 0,25400 | 0,56460 |
| 15,00 | 10,00 | 0,38100 | 0,00381 | 15,96081 | 0,38100 | 0,62653 |
| 25,00 | 11,00 | 0,63500 | 0,00635 | 16,00161 | 0,63500 | 0,68743 |
| 50,00 | 12,00 | 1,27000 | 0,01270 | 16,10453 | 1,27000 | 0,74513 |
| 75,00 | 13,50 | 1,90500 | 0,01905 | 16,20878 | 1,90500 | 0,83288 |
| 100,00 | 14,00 | 2,54000 | 0,02540 | 16,31439 | 2,54000 | 0,85814 |
| 150,00 | 15,00 | 3,81000 | 0,03810 | 16,52978 | 3,81000 | 0,90745 |
| 200,00 | 16,00 | 5,08000 | 0,05080 | 16,75095 | 5,08000 | 0,95517 |
| 250,00 | 17,00 | 6,35000 | 0,06350 | 16,97811 | 6,35000 | 1,00129 |
| 300,00 | 18,20 | 7,62000 | 0,07620 | 17,21152 | 7,62000 | 1,05743 |
| 400,00 | 19,00 | 10,16000 | 0,10160 | 17,69813 | 10,16000 | 1,07356 |
| 500,00 | 18,00 | 12,70000 | 0,12700 | 18,21306 | 12,70000 | 0,98830 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

COMPRESION INCONFINADA



qu(kg/cm2) 1,07

cu(kg/cm2) 0,54

INGEOLAB

LABORATORIO DE INGENIERIA CIVIL

ENSAYO DE COMPRESION INCONFINADA

FECHA: MOSQUERA, DICIEMBRE DE 2013
 PROYECTO: EDIFICIO EN 6 PISOS Y SOTANO UBICADO EN LA CARRERA 13 No 10-83/85/91 BOGOTA
 SONDEO: 4 MUESTRA 1
 PROFUNDIDAD: 2,50 METROS

DATOS DE LA MUESTRA

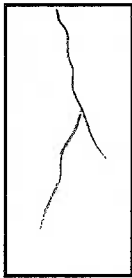
| | | | | | |
|---------------|--------------|-----------------|--------------|--------------|--------------------|
| DIAM. INICIAL | <u>4,50</u> | cm | DIAM. FINAL | <u>4,68</u> | cm |
| AREA INICIAL | <u>15,90</u> | cm ² | AREA FINAL | <u>17,20</u> | cm ² |
| ALT. INICIAL | <u>10,00</u> | cm | ALT. FINAL | <u>9,24</u> | cm |
| HUMEDAD | <u>44,50</u> | % | DENS. HUMEDA | <u>1,349</u> | gr/cm ³ |

DESCRIPCION DE LA MUESTRA : Arcilla arenosa en matriz gravosa color habana grisacea

DATOS DE HUMEDAD

pl 214,60 grs

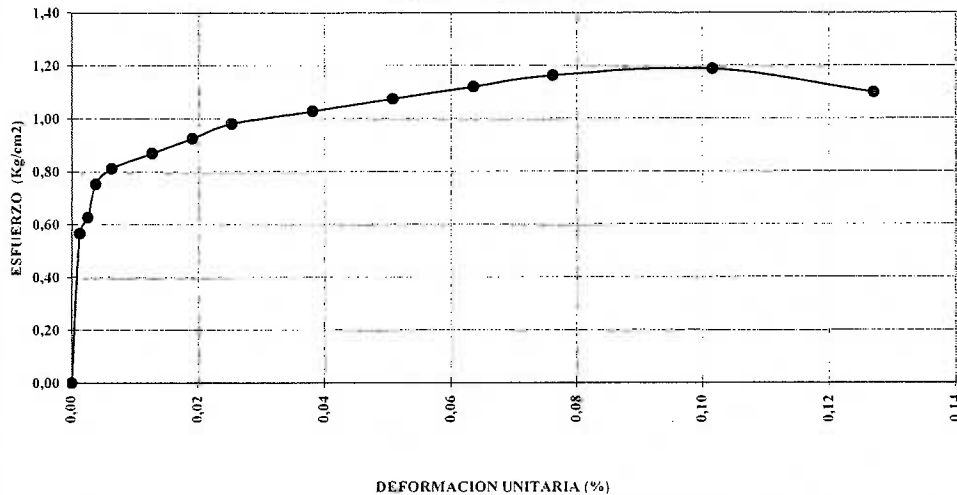
wn 44,50 %



ESQUEMA DE FALLA

| LECTURA DEL DEFORMIMETRO (10 ⁻¹ plg) | CARGA APLICADA KG | DEFORMACION DE LA MUESTRA (mm) | DEFORMACION UNITARIA (10 ⁻²) | AREA CORREGIDA (cm ²) | DEFORMACION UNITARIA % | ESFUERZO SOBRE LA MUESTRA (Kg/cm ²) |
|---|-------------------|--------------------------------|--|-----------------------------------|------------------------|---|
| 0,00 | 0,00 | 0,00000 | 0,00000 | 15,90000 | 0,00000 | 0,00000 |
| 5,00 | 9,00 | 0,12700 | 0,00127 | 15,92022 | 0,12700 | 0,56532 |
| 10,00 | 10,00 | 0,25400 | 0,00254 | 15,94049 | 0,25400 | 0,62733 |
| 15,00 | 12,00 | 0,38100 | 0,00381 | 15,96081 | 0,38100 | 0,75184 |
| 25,00 | 13,00 | 0,63500 | 0,00635 | 16,00161 | 0,63500 | 0,81242 |
| 50,00 | 14,00 | 1,27000 | 0,01270 | 16,10453 | 1,27000 | 0,86932 |
| 75,00 | 15,00 | 1,90500 | 0,01905 | 16,20878 | 1,90500 | 0,92542 |
| 100,00 | 16,00 | 2,54000 | 0,02540 | 16,31439 | 2,54000 | 0,98073 |
| 150,00 | 17,00 | 3,81000 | 0,03810 | 16,52978 | 3,81000 | 1,02845 |
| 200,00 | 18,00 | 5,08000 | 0,05080 | 16,75095 | 5,08000 | 1,07457 |
| 250,00 | 19,00 | 6,35000 | 0,06350 | 16,97811 | 6,35000 | 1,11909 |
| 300,00 | 20,00 | 7,62000 | 0,07620 | 17,21152 | 7,62000 | 1,16201 |
| 400,00 | 21,00 | 10,16000 | 0,10160 | 17,69813 | 10,16000 | 1,18657 |
| 500,00 | 20,00 | 12,70000 | 0,12700 | 18,21306 | 12,70000 | 1,09811 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

COMPRESION INCONFINADA



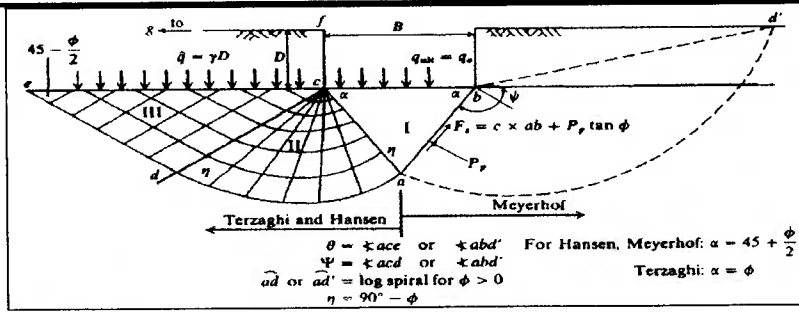
qu(kg/cm2) 1,19

cu(kg/cm2) 0,59

INGEOLAB - RESULTADOS DE LABORATORIO

| Sondeo No. | Muestra | | Wn % | L.L. % | L.P. % | I.P. % | Gradacion % que pasa | | | | | | Compresion Inconfinada | | |
|--|---------|-----------|-----------------------------------|--------|--------|--------|----------------------|-------|--------|--------|-------|-----|---------------------------|-------------|-----------|
| | No. | Prof. mts | | | | | 3/4 | No. 4 | No. 40 | N0.100 | N-200 | USC | Den. hum.g/cm3 | Cu.(Kg/cm2) | qu.kg/cm2 |
| 1 | 1 | 1,00 | 23,6 | 58 | 40 | 18 | 100 | 100 | 100 | 100 | 90,2 | MH | | | |
| 1 | 2 | 2,00 | 44,5 | 82 | 30 | 52 | 100 | 100 | 100 | 100 | 96,5 | CH | 1,347 | 0,50 | 0,99 |
| 1 | 3 | 12,00 | 52,8 | 70 | 25 | 45 | 100 | 100 | 100 | 100 | 97,2 | CH | | | |
| 2 | 1 | 0,40 | 22,6 | 60 | 40 | 20 | 100 | 100 | 100 | 100 | 80,1 | OH | | | |
| 2 | 2 | 3,00 | 45,8 | 75 | 30 | 45 | 100 | 100 | 100 | 100 | 91,2 | CH | 1,35 | 0,62 | 1,24 |
| 2 | 3 | 14,00 | 60,2 | 75 | 30 | 45 | 100 | 100 | 100 | 100 | 96,5 | CH | | | |
| 3 | 1 | 0,70 | 28,6 | 62 | 40 | 22 | 100 | 100 | 100 | 100 | 92,4 | OH | | | |
| 3 | 2 | 3,00 | 46,9 | 62 | 20 | 42 | 100 | 100 | 100 | 100 | 96,8 | CH | 1,335 | 0,54 | 1,07 |
| 3 | 3 | 13,60 | 62,8 | 70 | 26 | 40 | 100 | 100 | 100 | 100 | 98,4 | CH | | | |
| 4 | 1 | 1,40 | 25,2 | 65 | 40 | 25 | 100 | 100 | 100 | 100 | 90,5 | OH | | | |
| 4 | 2 | 2,50 | 50,2 | 70 | 20 | 50 | 100 | 100 | 100 | 100 | 95,6 | CH | 1,349 | 0,59 | 1,19 |
| 4 | 3 | 12,00 | 65,6 | 60 | 20 | 50 | 100 | 100 | 100 | 100 | 97,5 | CH | | | |
| EDIFICIO EN 6 PISOS Y SOTANO UBICADO | | | RESULTADOS ENSAYOS DE LABORATORIO | | | | | | | | | | | | |
| EN LA CARRERA 13 No 10-83/85/91 BOGOTA | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | FECHA; DICIEMBRE DE 2,013 | | |

CALCULO DE CAPACIDAD PORTANTE (Edificio 6 pisos y sotano carrera 13 No 10-83 Bogota D.C)



$$q_u = cN_c s_c d_c i_c + DgN_q s_q d_q i_q + 0.5gBN_g s_g d_g i_g$$

1. Datos de entrada

| | | |
|---------------------------------------|-------|-------------------|
| 1. Angulo de fricción interna $f =$ | 12 | ° |
| 2. Cohesión c | 27 | Kpa |
| 3. Carga axial $V =$ | 200 | KN |
| 4. Momento $M =$ | 10 | KN-m |
| 5. Excentricidad $e =$ | 0,050 | |
| 6. Base de la zapata (B) = | 1,950 | m |
| 7. Lado de la zapata (L) = | 9,950 | m |
| 8. Area efectiva | 19,40 | m ² |
| 9. Profundidad de cimentación $D_f =$ | 3,8 | m |
| 10. Peso unitario del suelo $g =$ | 12,89 | KN/m ³ |
| 11. Fuerza horizontal $H_B =$ | 200 | KN |

2. Valores de coeficientes de capacidad de carga

| | |
|---------|-------|
| $N_c =$ | 10,16 |
| $N_q =$ | 2,98 |
| $N_g =$ | 0,69 |

3. Factores de forma

| | |
|------------------------------|------------|
| $S_c = 1 + (N_q/N_c)(B/L) =$ | 1,06 |
| $S_q = 1 + (B/L)\tan(f) =$ | 1,04 |
| $S_g = 1 - 0.4(B/L) =$ | 0,92160804 |

4. Factores de profundidad

| | |
|--|------|
| $d_c = 1.0 + 0.4 (D/B) =$ | 1,2 |
| $d_q = 1 + 2\tan f(1 - \sin f)^2(D/B) =$ | 1,10 |
| $d_g =$ | 1 |

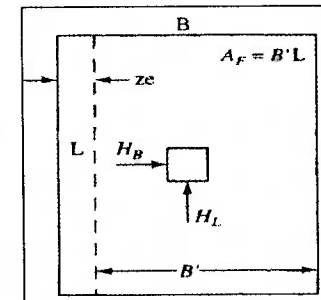
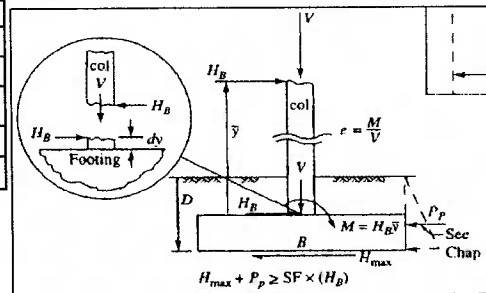
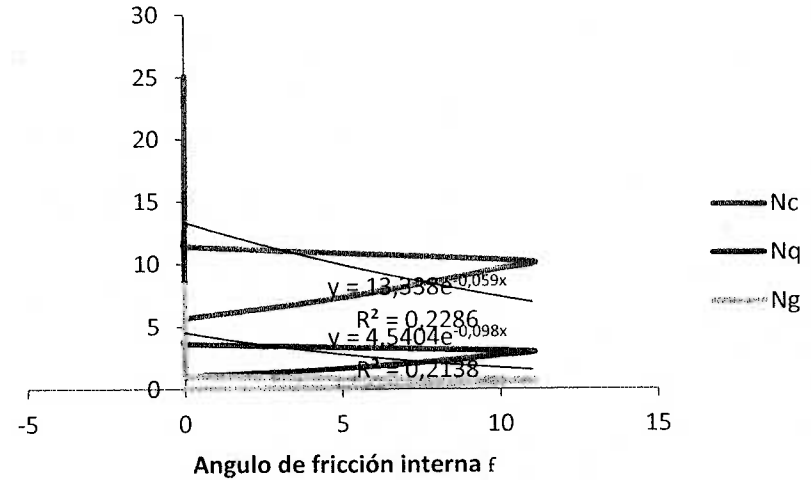
5. Factores de inclinación

| | |
|--|------|
| $i_c = 0.5 - (1 - H_B/A_f c)^{0.5}$ | 0,25 |
| $i_q = [1 - 0.5H_B/V + A_f c \cot(f)]^2$ | 0,93 |
| $i_g = [1 - 0.7H_B/V + A_f c \cot(f)]^2$ | 0,90 |

6 Calculo de capacidad portante

| | | |
|-------------------------------------|--------|-----|
| q_u | 245,96 | Kpa |
| Factor de seguridad NSR-10 | 3 | |
| Calculo de capacidad portante q_a | 82,0 | Kpa |

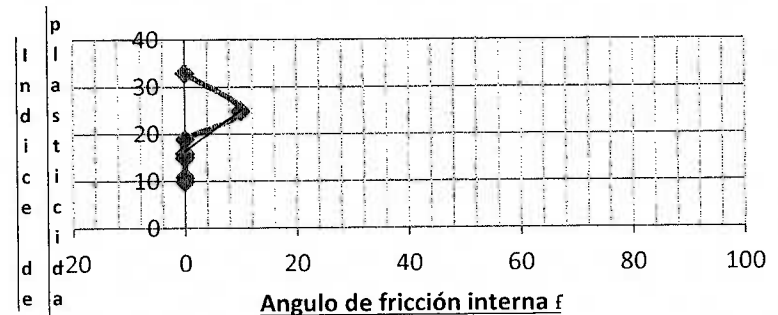
Valores de factores de capacidad de carga



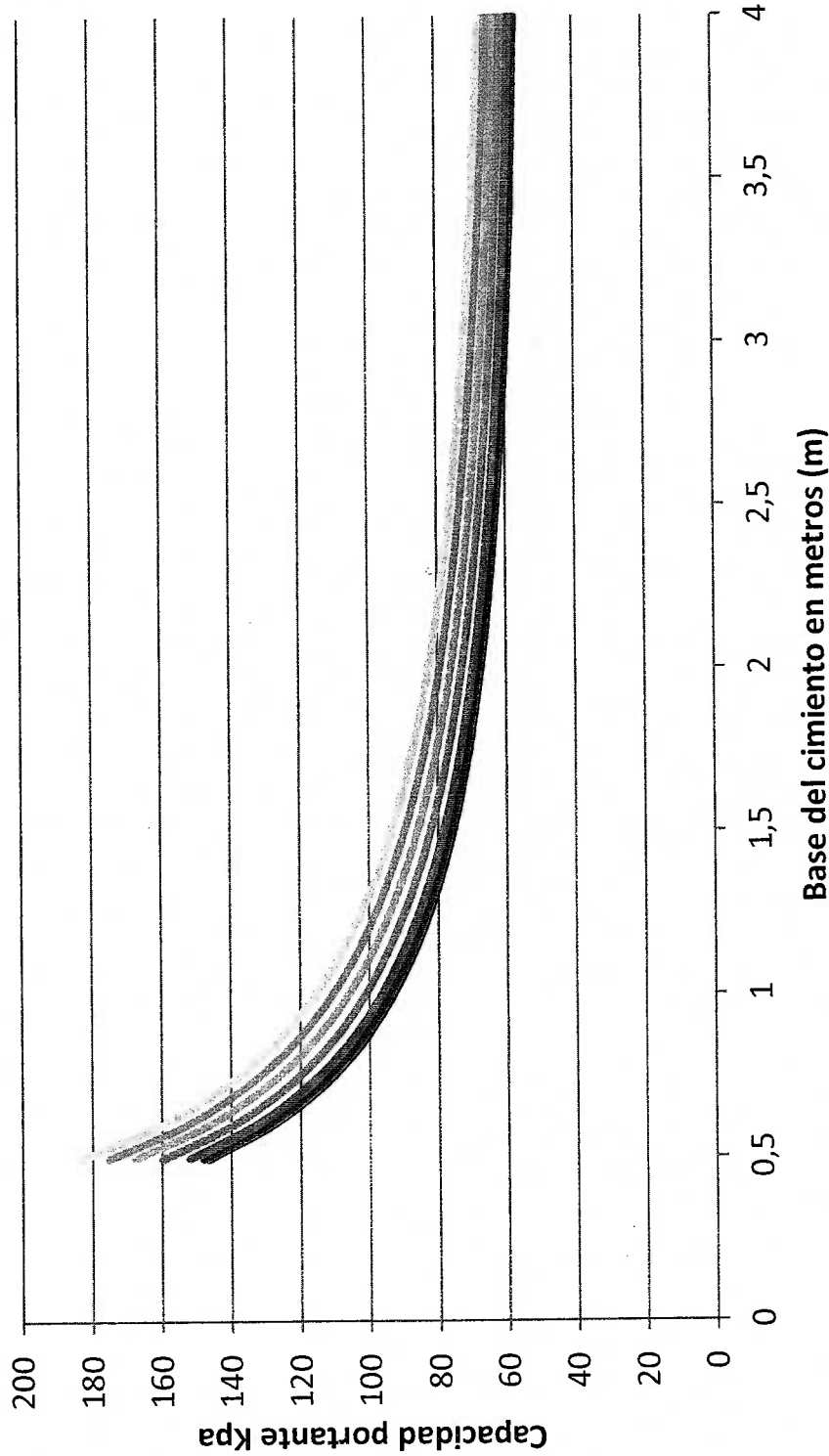
$$y = 0,87x + 16,3$$

$$R^2 = 0,1438$$

Variación de IP vs. f



GRAFICA DE CAPACIDAD PORTANTE q_u VS B



DISEÑO DE CAISSONS POR MÉTODO MODIFICADO a

Arcilla Condición Crítica - No drenada ($\phi = 0$)

| | |
|------|-----|
| F.S. | 3,0 |
|------|-----|

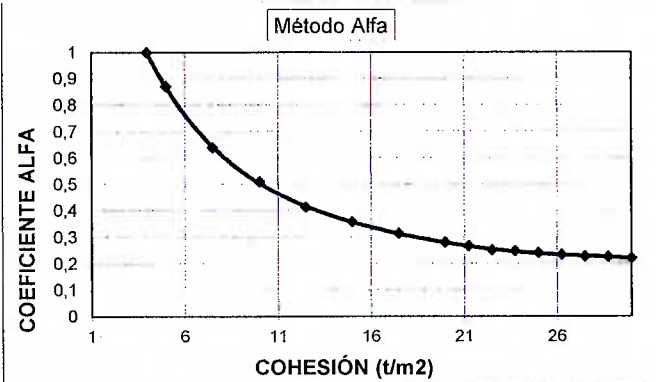
| F (m) | p |
|-------|-------|
| 0,25 | 0,785 |
| 0,30 | 0,942 |
| 0,40 | 1,257 |
| 0,50 | 1,571 |
| 0,60 | 1,885 |

$$P_{nu} = P_p + P_s$$

$$P_p = 9 \cdot C_u \cdot A_p$$

$$P_s = \Sigma(P \cdot \alpha_i \cdot C_{u_i} \cdot Z_i)$$

$$P_{ns} = P_{nu} / 2,5$$



| DI (m) | Z (m) | Cu (t/m ²) | Alfa | Ø 0,25 | | | Ø 0,3 | | | Ø 0,4 | | | Ø 0,5 | | | Ø 0,6 | | |
|--------|-------|------------------------|------|--------|------|------|-------|------|------|-------|------|-------|-------|------|-------|-------|------|-------|
| | | | | DPp | DPs | DPns | DPp | DPs | DPns | DPp | DPs | DPns | DPp | DPs | DPns | DPp | DPs | DPns |
| 1,0 | 1,0 | 1,00 | 1,00 | 0,44 | 0,79 | 0,41 | 0,64 | 0,94 | 0,53 | 1,13 | 1,26 | 0,80 | 1,77 | 1,57 | 1,11 | 2,54 | 1,88 | 1,48 |
| 1,0 | 2,0 | 1,00 | 1,00 | 0,44 | 0,79 | 0,67 | 0,64 | 0,94 | 0,84 | 1,13 | 1,26 | 1,21 | 1,77 | 1,57 | 1,64 | 2,54 | 1,88 | 2,10 |
| 1,0 | 3,0 | 1,00 | 1,00 | 0,44 | 0,79 | 0,93 | 0,64 | 0,94 | 1,15 | 1,13 | 1,26 | 1,63 | 1,77 | 1,57 | 2,16 | 2,54 | 1,88 | 2,73 |
| 1,0 | 4,0 | 1,00 | 1,00 | 0,44 | 0,79 | 1,19 | 0,64 | 0,94 | 1,47 | 1,13 | 1,26 | 2,05 | 1,77 | 1,57 | 2,68 | 2,54 | 1,88 | 3,36 |
| 1,0 | 5,0 | 1,00 | 1,00 | 0,44 | 0,79 | 1,46 | 0,64 | 0,94 | 1,78 | 1,13 | 1,26 | 2,47 | 1,77 | 1,57 | 3,21 | 2,54 | 1,88 | 3,99 |
| 1,0 | 6,0 | 1,00 | 1,00 | 0,44 | 0,79 | 1,72 | 0,64 | 0,94 | 2,10 | 1,13 | 1,26 | 2,89 | 1,77 | 1,57 | 3,73 | 2,54 | 1,88 | 4,62 |
| 1,0 | 7,0 | 1,00 | 1,00 | 0,44 | 0,79 | 1,98 | 0,64 | 0,94 | 2,41 | 1,13 | 1,26 | 3,31 | 1,77 | 1,57 | 4,25 | 2,54 | 1,88 | 5,25 |
| 1,0 | 8,0 | 1,00 | 1,00 | 0,44 | 0,79 | 2,24 | 0,64 | 0,94 | 2,73 | 1,13 | 1,26 | 3,73 | 1,77 | 1,57 | 4,78 | 2,54 | 1,88 | 5,87 |
| 1,0 | 9,0 | 1,00 | 1,00 | 0,44 | 0,79 | 2,50 | 0,64 | 0,94 | 3,04 | 1,13 | 1,26 | 4,15 | 1,77 | 1,57 | 5,30 | 2,54 | 1,88 | 6,50 |
| 1,0 | 10,0 | 1,00 | 1,00 | 0,44 | 0,79 | 2,77 | 0,64 | 0,94 | 3,35 | 1,13 | 1,26 | 4,57 | 1,77 | 1,57 | 5,83 | 2,54 | 1,88 | 7,13 |
| 1,0 | 11,0 | 1,00 | 1,00 | 0,44 | 0,79 | 3,03 | 0,64 | 0,94 | 3,67 | 1,13 | 1,26 | 4,98 | 1,77 | 1,57 | 6,35 | 2,54 | 1,88 | 7,76 |
| 1,0 | 12,0 | 1,00 | 1,00 | 0,44 | 0,79 | 3,29 | 0,64 | 0,94 | 3,98 | 1,13 | 1,26 | 5,40 | 1,77 | 1,57 | 6,87 | 2,54 | 1,88 | 8,39 |
| 1,0 | 13,0 | 1,00 | 1,00 | 0,44 | 0,79 | 3,55 | 0,64 | 0,94 | 4,30 | 1,13 | 1,26 | 5,82 | 1,77 | 1,57 | 7,40 | 2,54 | 1,88 | 9,02 |
| 1,0 | 14,0 | 1,00 | 1,00 | 0,44 | 0,79 | 3,81 | 0,64 | 0,94 | 4,61 | 1,13 | 1,26 | 6,24 | 1,77 | 1,57 | 7,92 | 2,54 | 1,88 | 9,64 |
| 1,0 | 15,0 | 1,00 | 1,00 | 0,44 | 0,79 | 4,07 | 0,64 | 0,94 | 4,92 | 1,13 | 1,26 | 6,66 | 1,77 | 1,57 | 8,44 | 2,54 | 1,88 | 10,27 |
| 1,0 | 16,0 | 1,00 | 1,00 | 0,44 | 0,79 | 4,34 | 0,64 | 0,94 | 5,24 | 1,13 | 1,26 | 7,08 | 1,77 | 1,57 | 8,97 | 2,54 | 1,88 | 10,90 |
| 1,0 | 17,0 | 1,00 | 1,00 | 0,44 | 0,79 | 4,60 | 0,64 | 0,94 | 5,55 | 1,13 | 1,26 | 7,50 | 1,77 | 1,57 | 9,49 | 2,54 | 1,88 | 11,53 |
| 1,0 | 18,0 | 1,00 | 1,00 | 0,44 | 0,79 | 4,86 | 0,64 | 0,94 | 5,87 | 1,13 | 1,26 | 7,92 | 1,77 | 1,57 | 10,01 | 2,54 | 1,88 | 12,16 |
| 1,0 | 19,0 | 1,00 | 1,00 | 0,44 | 0,79 | 5,12 | 0,64 | 0,94 | 6,18 | 1,13 | 1,26 | 8,34 | 1,77 | 1,57 | 10,54 | 2,54 | 1,88 | 12,79 |
| 1,0 | 20,0 | 1,00 | 1,00 | 0,44 | 0,79 | 5,38 | 0,64 | 0,94 | 6,50 | 1,13 | 1,26 | 8,75 | 1,77 | 1,57 | 11,06 | 2,54 | 1,88 | 13,41 |
| 1,0 | 21,0 | 1,00 | 1,00 | 0,44 | 0,79 | 5,65 | 0,64 | 0,94 | 6,81 | 1,13 | 1,26 | 9,17 | 1,77 | 1,57 | 11,58 | 2,54 | 1,88 | 14,04 |
| 1,0 | 22,0 | 1,00 | 1,00 | 0,44 | 0,79 | 5,91 | 0,64 | 0,94 | 7,12 | 1,13 | 1,26 | 9,59 | 1,77 | 1,57 | 12,11 | 2,54 | 1,88 | 14,67 |
| 1,0 | 23,0 | 1,00 | 1,00 | 0,44 | 0,79 | 6,17 | 0,64 | 0,94 | 7,44 | 1,13 | 1,26 | 10,01 | 1,77 | 1,57 | 12,63 | 2,54 | 1,88 | 15,30 |
| 1,0 | 24,0 | 1,00 | 1,00 | 0,44 | 0,79 | 6,43 | 0,64 | 0,94 | 7,75 | 1,13 | 1,26 | 10,43 | 1,77 | 1,57 | 13,16 | 2,54 | 1,88 | 15,93 |
| 1,0 | 25,0 | 1,00 | 1,00 | 0,44 | 0,79 | 6,69 | 0,64 | 0,94 | 8,07 | 1,13 | 1,26 | 10,85 | 1,77 | 1,57 | 13,68 | 2,54 | 1,88 | 16,56 |
| 1,0 | 26,0 | 1,00 | 1,00 | 0,44 | 0,79 | 6,95 | 0,64 | 0,94 | 8,38 | 1,13 | 1,26 | 11,27 | 1,77 | 1,57 | 14,20 | 2,54 | 1,88 | 17,18 |
| 1,0 | 27,0 | 1,00 | 1,00 | 0,44 | 0,79 | 7,22 | 0,64 | 0,94 | 8,69 | 1,13 | 1,26 | 11,69 | 1,77 | 1,57 | 14,73 | 2,54 | 1,88 | 17,81 |
| 1,0 | 28,0 | 1,00 | 1,00 | 0,44 | 0,79 | 7,48 | 0,64 | 0,94 | 9,01 | 1,13 | 1,26 | 12,11 | 1,77 | 1,57 | 15,25 | 2,54 | 1,88 | 18,44 |
| 1,0 | 29,0 | 1,00 | 1,00 | 0,44 | 0,79 | 7,74 | 0,64 | 0,94 | 9,32 | 1,13 | 1,26 | 12,52 | 1,77 | 1,57 | 15,77 | 2,54 | 1,88 | 19,07 |
| 1,0 | 30,0 | 1,00 | 1,00 | 0,44 | 0,79 | 8,00 | 0,64 | 0,94 | 9,64 | 1,13 | 1,26 | 12,94 | 1,77 | 1,57 | 16,30 | 2,54 | 1,88 | 19,70 |

PROYECTO: EDIFICIO DE 6 PISOS Y SOTANO UBICADO EN LA CARRERA 13 No 10-83/85/91 BOGOTA D,C

CALCULO DEL FACTOR DIRECTO

1. CHEQUEO FACTOR DE SEGURIDAD DIRECTO CARGA MUERTA + CARGA VIVA MÁXIMA

Capacidad admisible de Carga (σ_{ns}) - (T/M²): 8,2 F_{SI} : 3

Nivel Freático: SI (Respecto al nivel actual del terreno)
 Nivel de Cimentación (Df): -3,80 m (Mínimo, respecto al nivel actual del terreno)
 Condición de Análisis: Drenada: No Drenada:

F_{SBM} (semilla)= 1,352

$$\sigma_{nu} = C * N_c * I_c * \delta_c * d_c * C_c + \gamma * D_f * N_q * I_q * \delta_q * d_q * C_q + 0.5 * \gamma * B * N_\gamma * I_\gamma * \delta_\gamma * d_\gamma * C_c$$

$\gamma =$ 1,29 t/m³ E (ton/m²): 1500 $\mu =$ 0,45
0,376873648 ϕ'_A 0,360412308

$\tau_F = C'_F + \sigma \tan \phi'_F =$ 2,496 T/M2

$\tau_A = C'_A + \sigma \tan \phi'_A =$ 1,346 T/M2

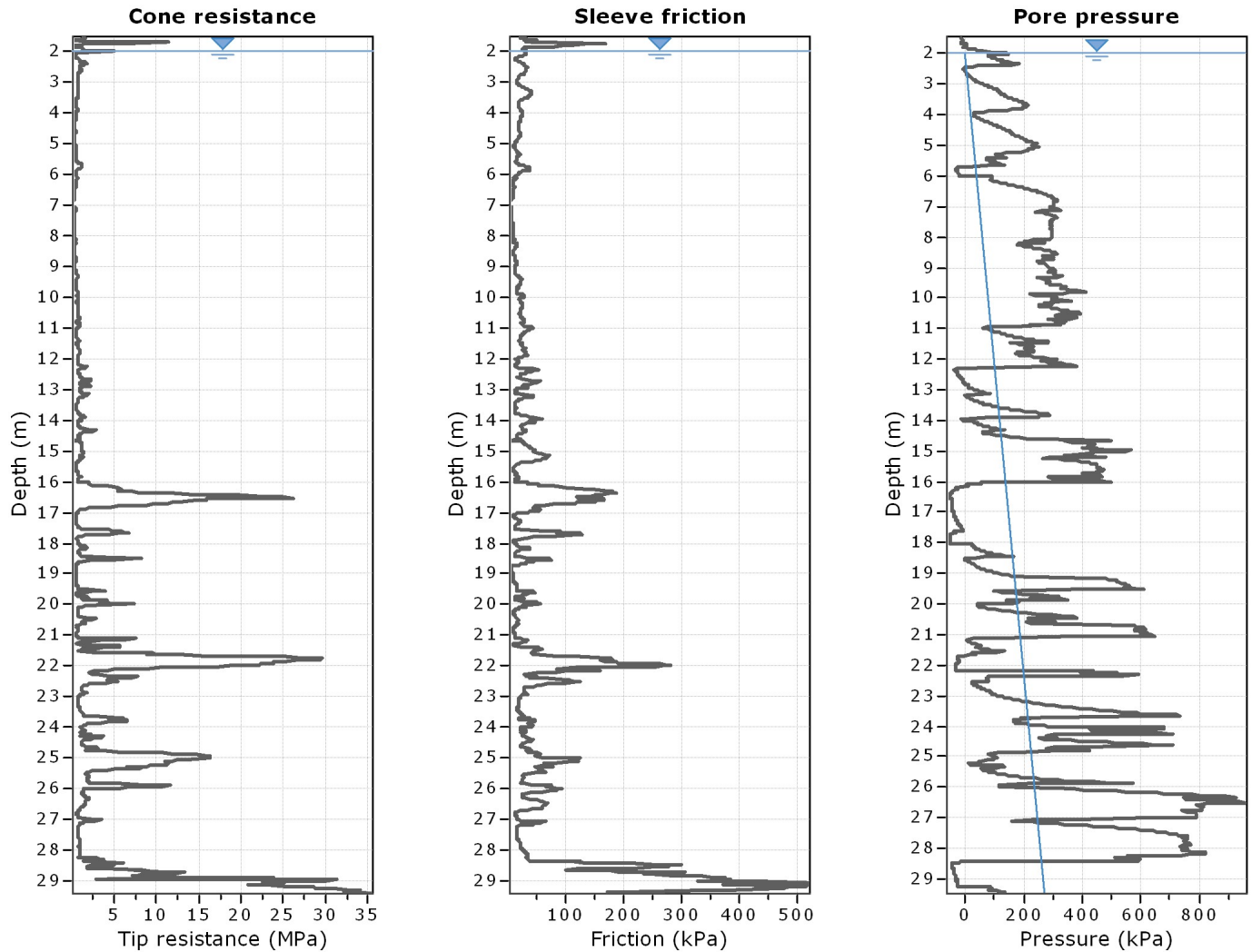
C'_A (Kg/cm²)= 0,0000 ϕ'_A (grado)= 20,650

$F_{SBM} = \tau_F / \tau_A =$ 1,854

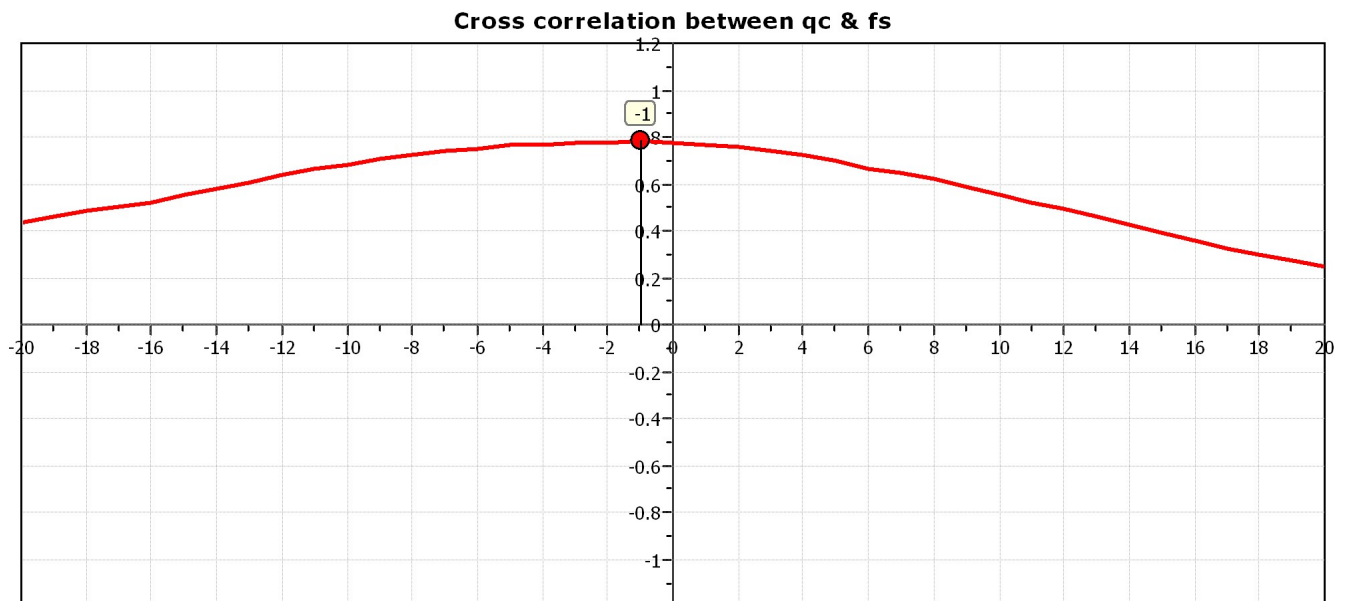
| | | | | | | | | | | | | | | | | | | | | | | | |
|--------|-------|-------|-------|---|----|-----|----|----|----|----|----|----|----|--|--|--|--|--|--|--|--|--|--|
| SL2-60 | 13.20 | 13.40 | 13.30 | ARCILLA ARENOSA CAFE GRIS CON PRESENCIA DE MATERIA ORGÁNICA (FIRME). PRESENTA INTERCALACIONES DE TURBA CON GRAVAS FINAS REDONDEADAS | | 1.6 | | | | | | | | | | | | | | | | | |
| SL2-60 | 13.40 | 15.40 | 14.40 | INTERCALACIONES DE ARCILLA CAFE ROJIZA CON INDICIOS DE ARENA CON GRAVAS FINAS GRISAS (FIRME) | | 1.6 | | | | | | | | | | | | | | | | | |
| SL2-60 | 15.40 | 16.20 | 15.80 | ARENA GRIS CON ALGO DE LIMO (FLOJA) | SM | 1.6 | | 16 | | | 86 | 14 | | | | | | | | | | | |
| SL2-60 | 16.20 | 17.30 | 16.75 | LIMO ARENOSO GRIS CON INDICIOS DEGRAVAS FINAS SUBREDONDEADAS, ANGULOSAS Y DE BAJA ESFERICIDAD (FIRME) | | 1.6 | | | | | | | | | | | | | | | | | |
| SL2-60 | 17.30 | 17.80 | 17.55 | ARCILLA GRIS CON INTERCALACIONES DE LIMO Y ARENA (FIRME) | | 1.6 | | | | | | | | | | | | | | | | | |
| SL2-60 | 17.80 | 18.05 | 17.93 | ARENA FINA CON ALGO DE LIMO E INDICIOS DE ARCILLA. GRAVAS FINAS ANGULOSAS DE BAJA ESFERICIDAD (MEDIANAMENTE DENSA). CLUSTOS ANGULOSOS DE BAJA ESFERICIDAD DE CUARZO, CHERTS, LIMOLITA Y ARENISCA. | CL | 1.6 | 10 | 19 | 33 | 15 | 18 | 46 | 54 | | | | | | | | | | |
| SL2-60 | 18.05 | 19.40 | 18.73 | ARCILLA ARENOSA GRIS (FIRME) | | 1.6 | | | | | | | | | | | | | | | | | |
| SL2-60 | 19.40 | 50.00 | 34.70 | ARCILLOLITA ABIGARRADA GRIS, NARANJA, CAFE ROJIZO, CAFE AMARILLENTO Y VIOLETA. PRESENTA UN 5% DE MICAS. ESPORADICAMENTE SE OBSERVA LAMINACIÓN PLANA PARALELA, SE DESCRIBE COMO GRADO IV DE METEORIZACIÓN, RESISTENCIA | | 1.6 | | | | | | | | | | | | | | | | | |



Project: Estudios Metro Bogotá
Location: CL 11 ENTRE AK 10 Y KR 11

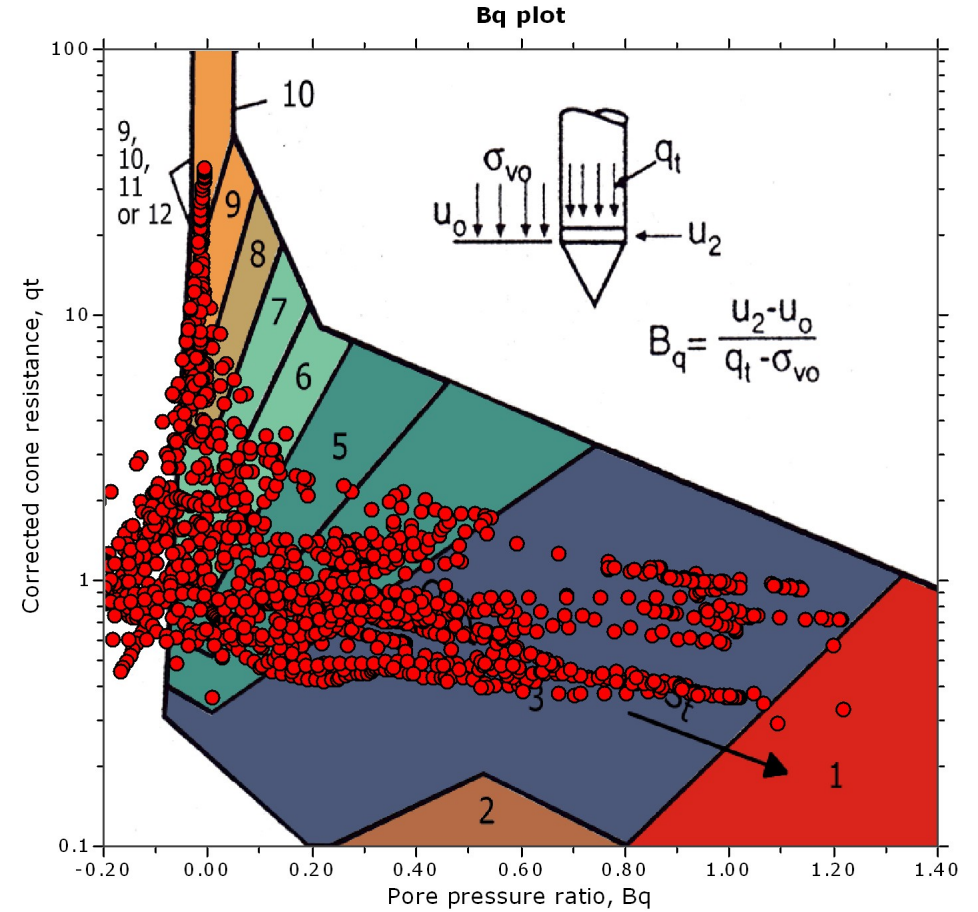
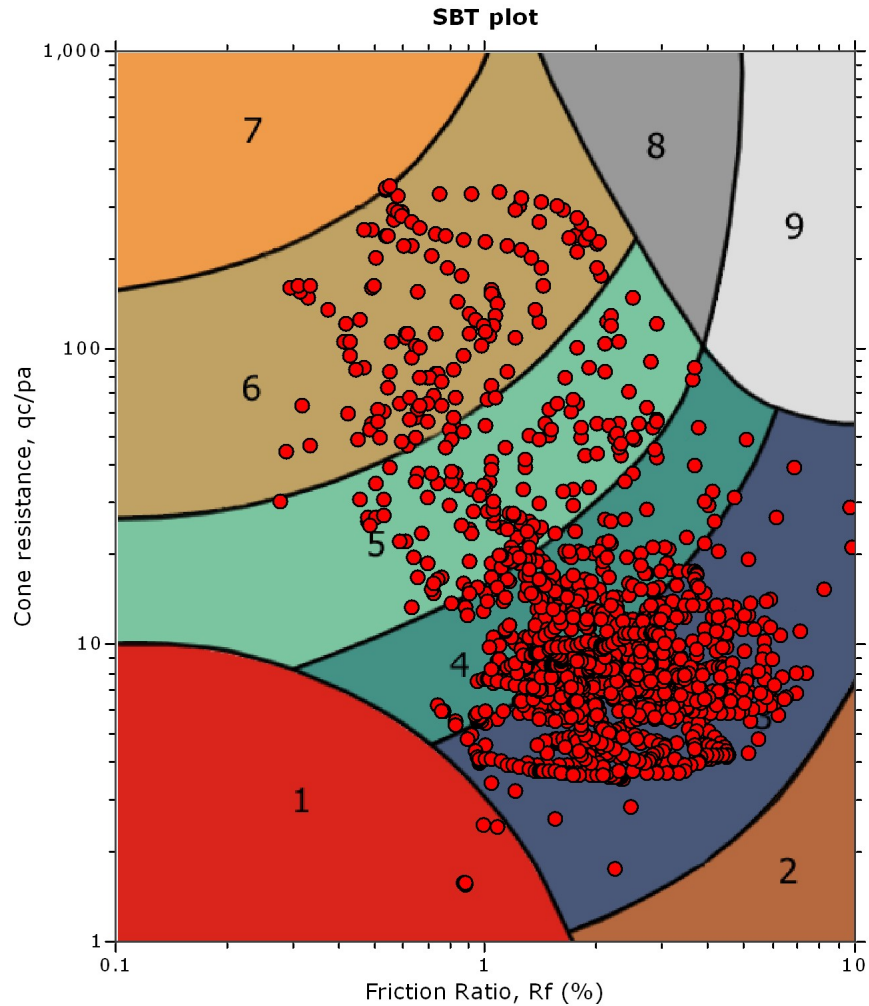


The plot below presents the cross correlation coefficient between the raw q_c and f_s values (as measured on the field). X axes presents the lag distance (one lag is the distance between two successive CPT measurements).





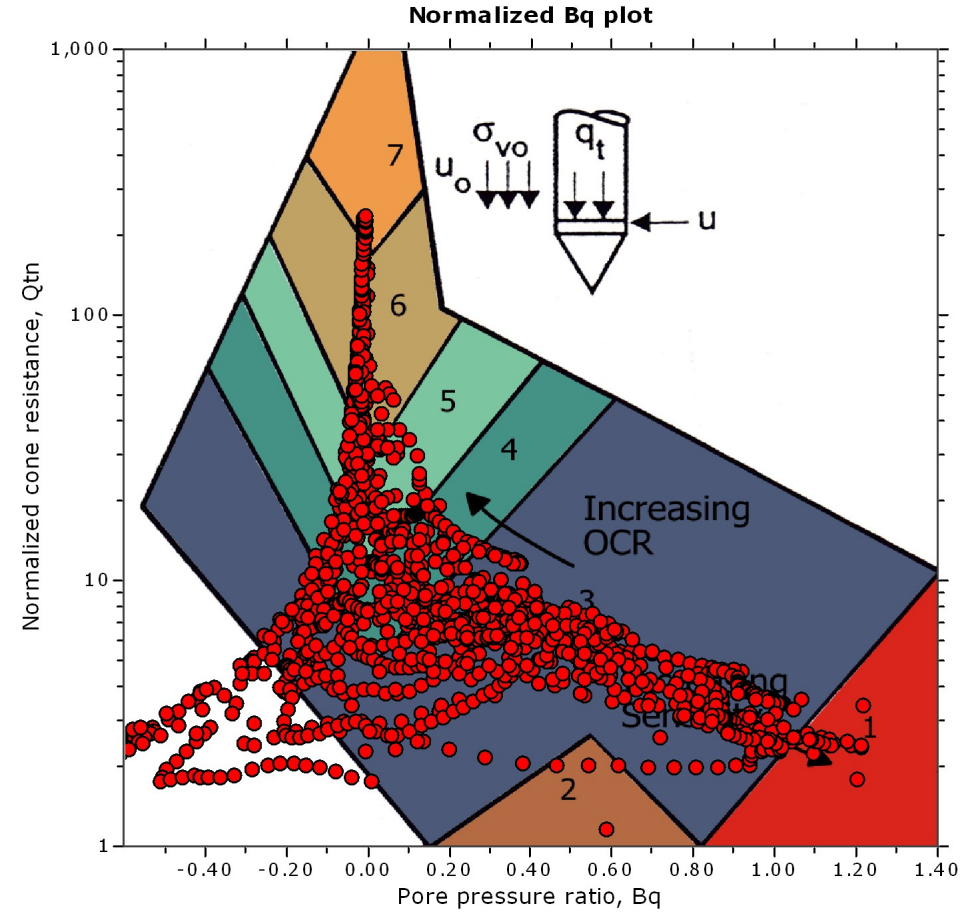
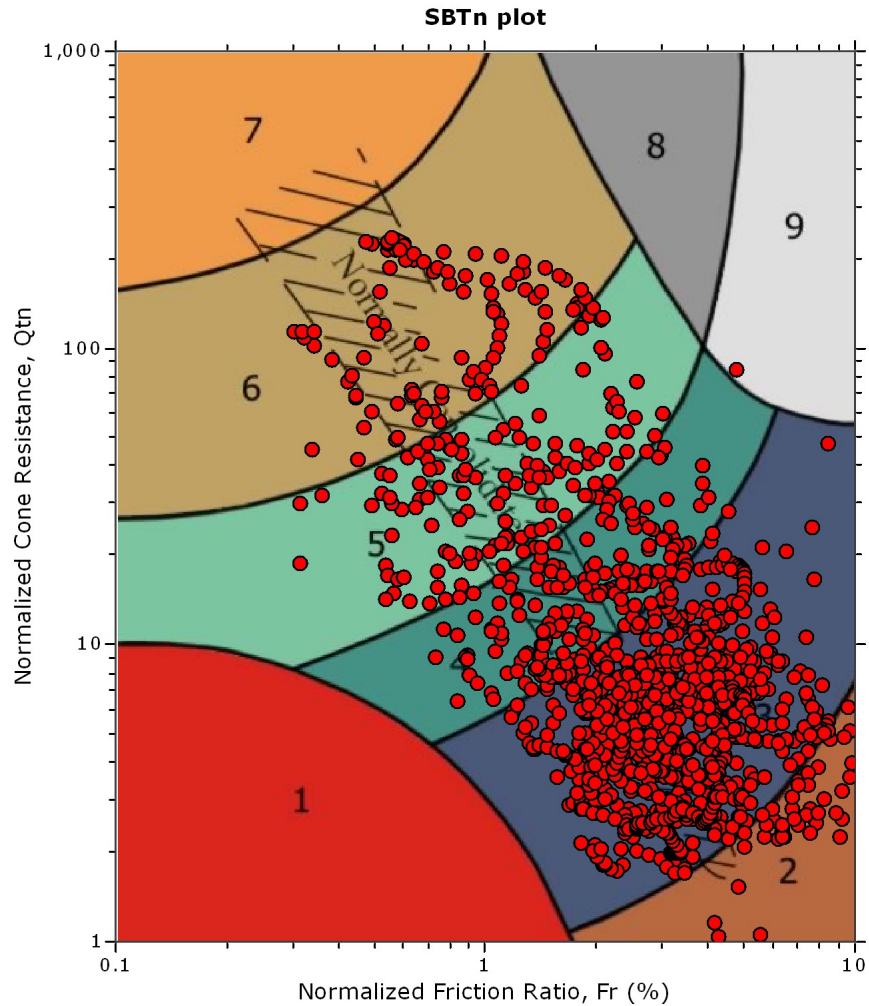
SBT - Bq plots



SBT legend

- 1. Sensitive fine grained
- 4. Clayey silt to silty clay
- 7. Gravely sand to sand
- 2. Organic material
- 5. Silty sand to sandy silt
- 8. Very stiff sand to clayey sand
- 3. Clay to silty clay
- 6. Clean sand to silty sand
- 9. Very stiff fine grained

SBT - Bq plots (normalized)

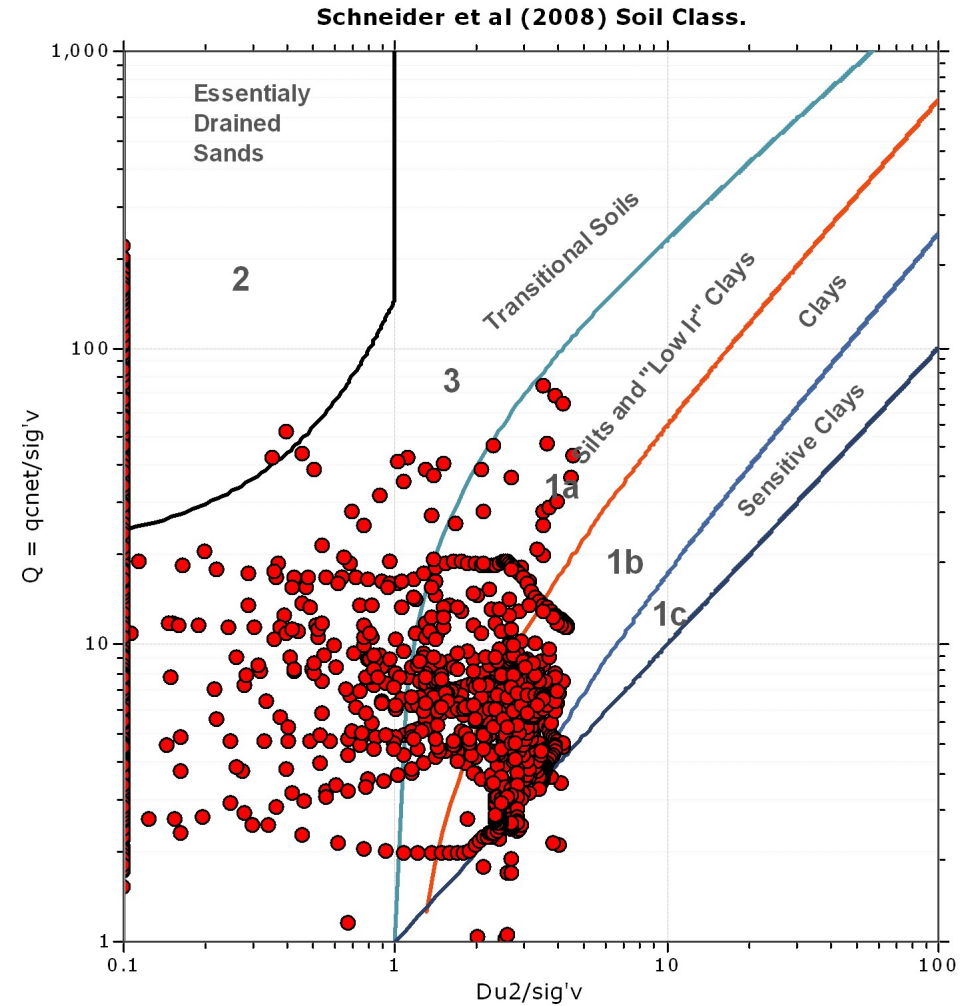
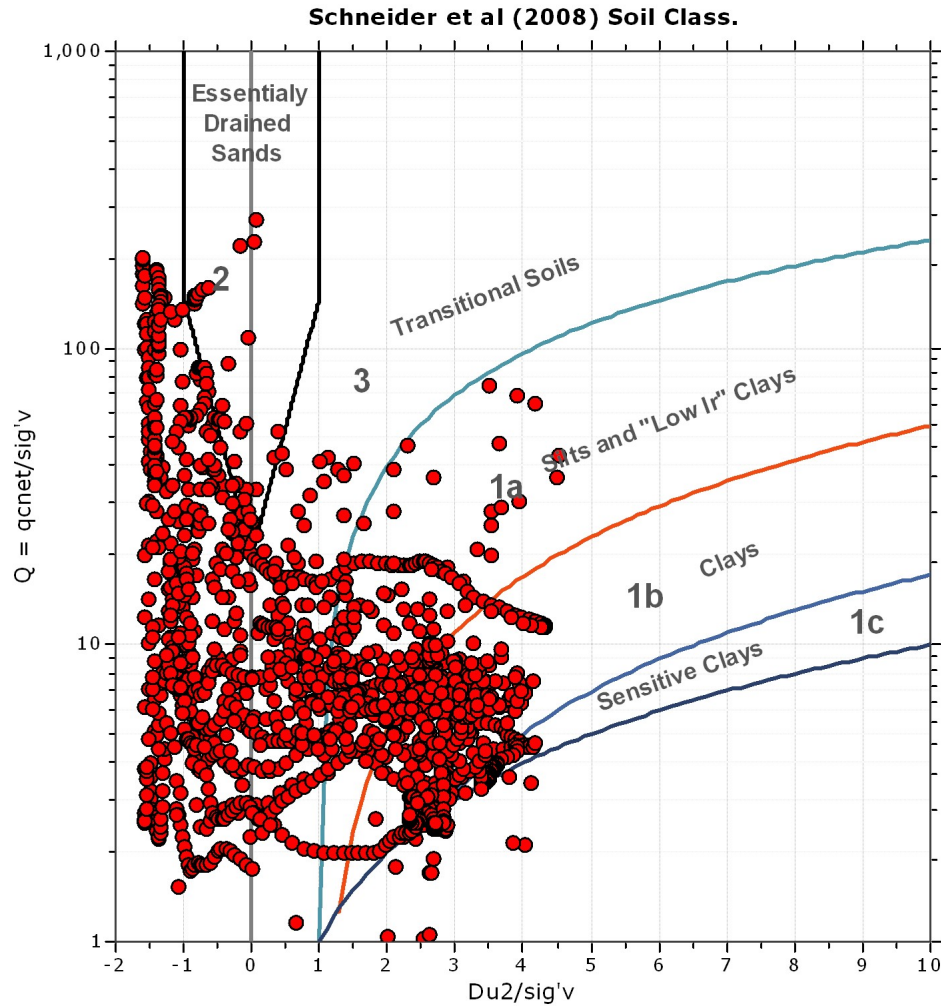


SBTn legend

- | | | |
|---------------------------|------------------------------|-----------------------------------|
| 1. Sensitive fine grained | 4. Clayey silt to silty clay | 7. Gravely sand to sand |
| 2. Organic material | 5. Silty sand to sandy silt | 8. Very stiff sand to clayey sand |
| 3. Clay to silty clay | 6. Clean sand to silty sand | 9. Very stiff fine grained |

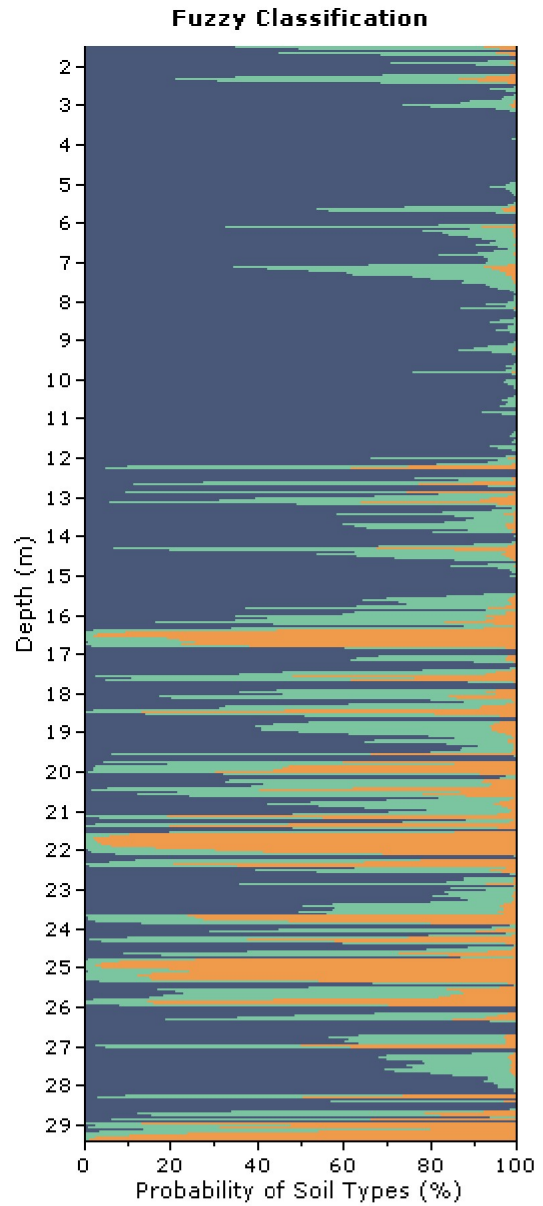
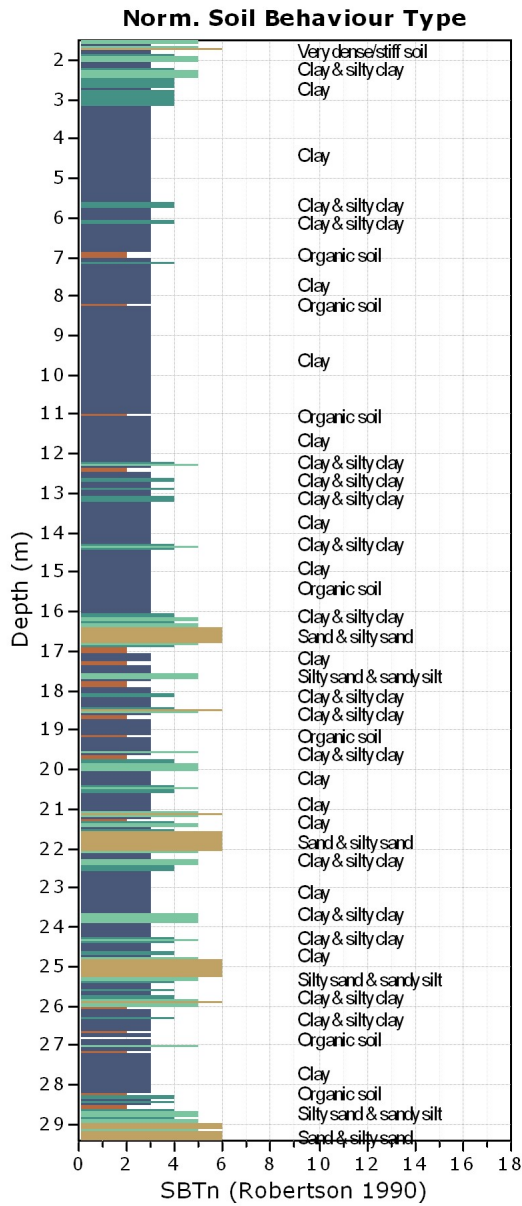


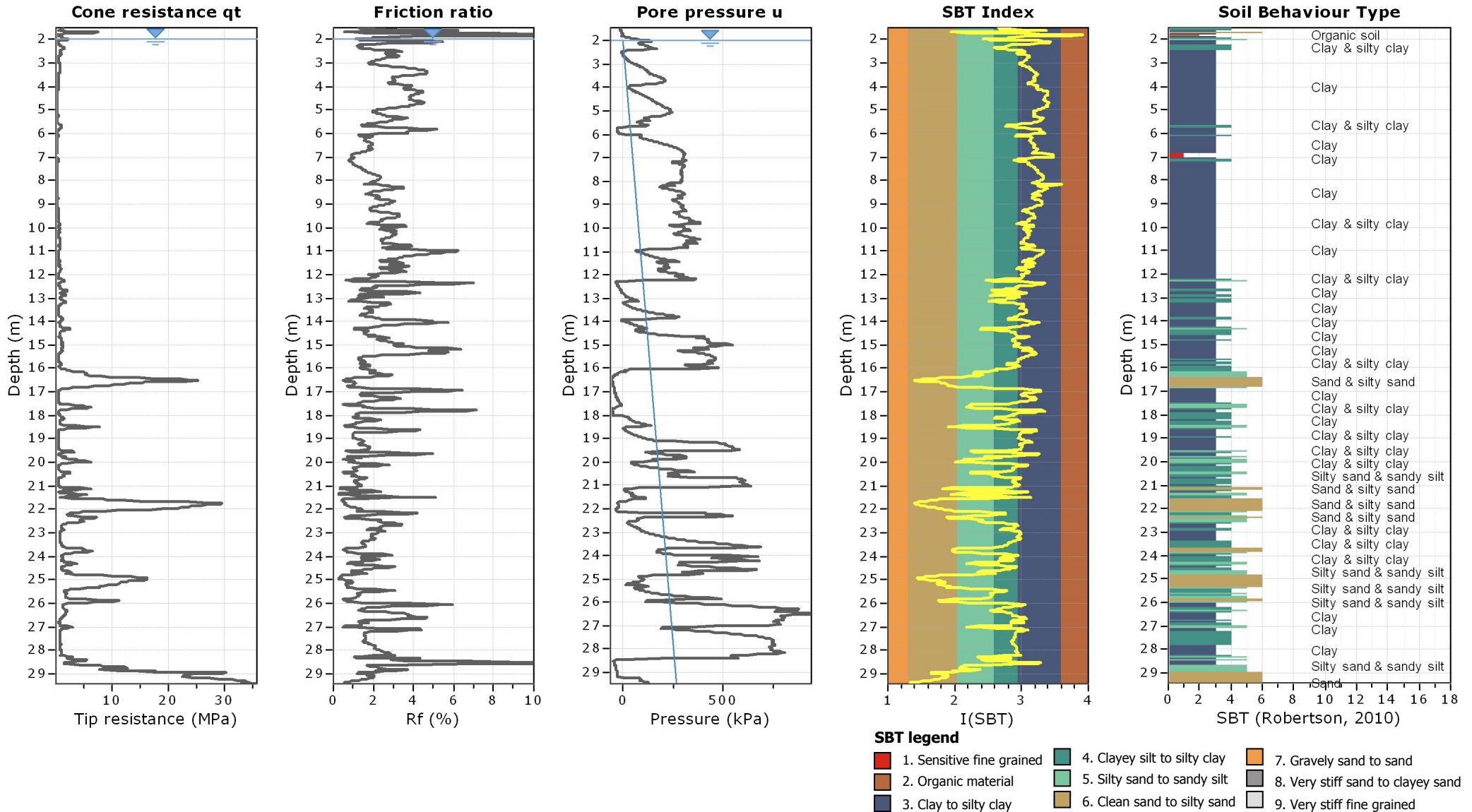
Bq plots (Schneider)





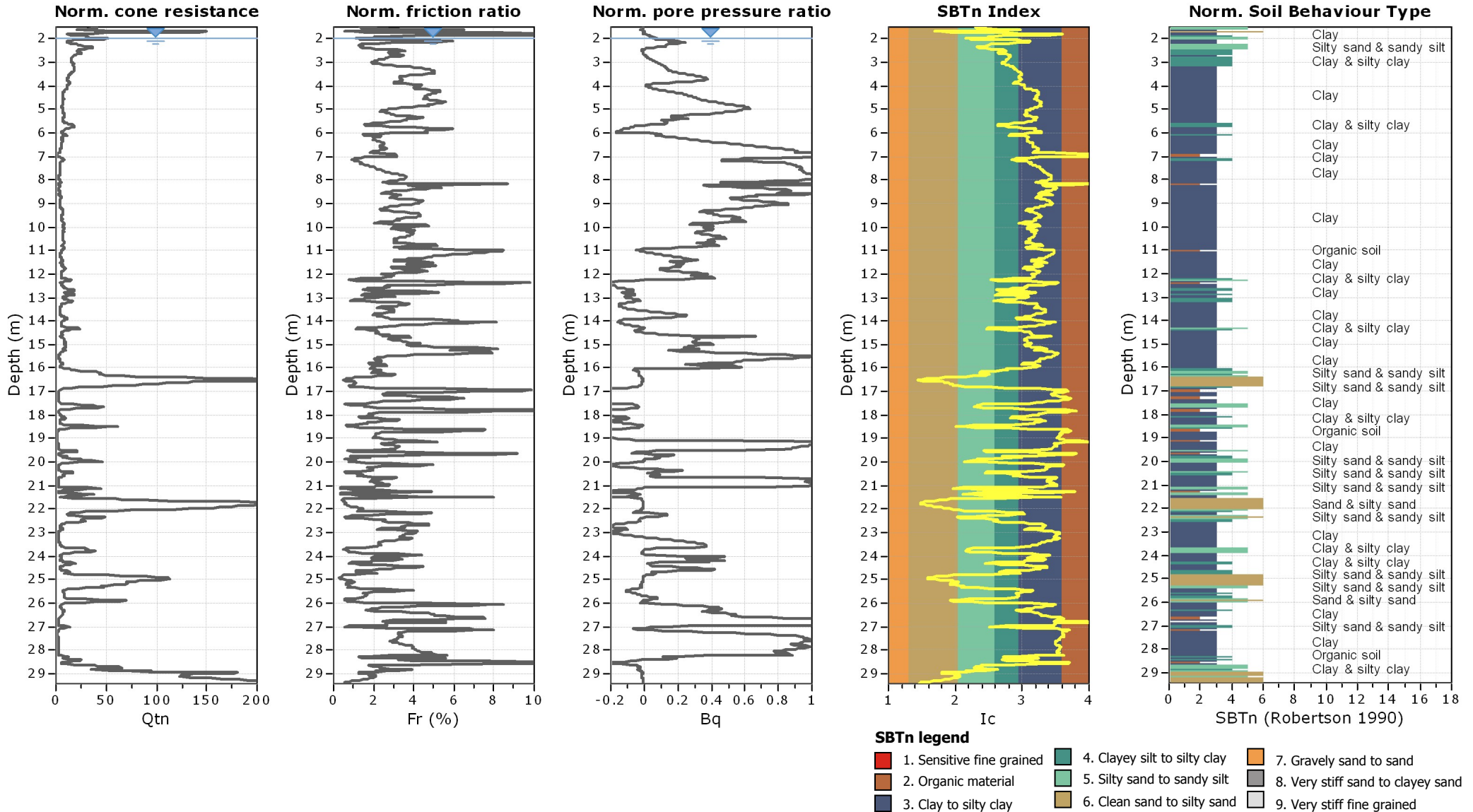
Project: Estudios Metro Bogotá
Location: CL 11 ENTRE AK 10 Y KR 11





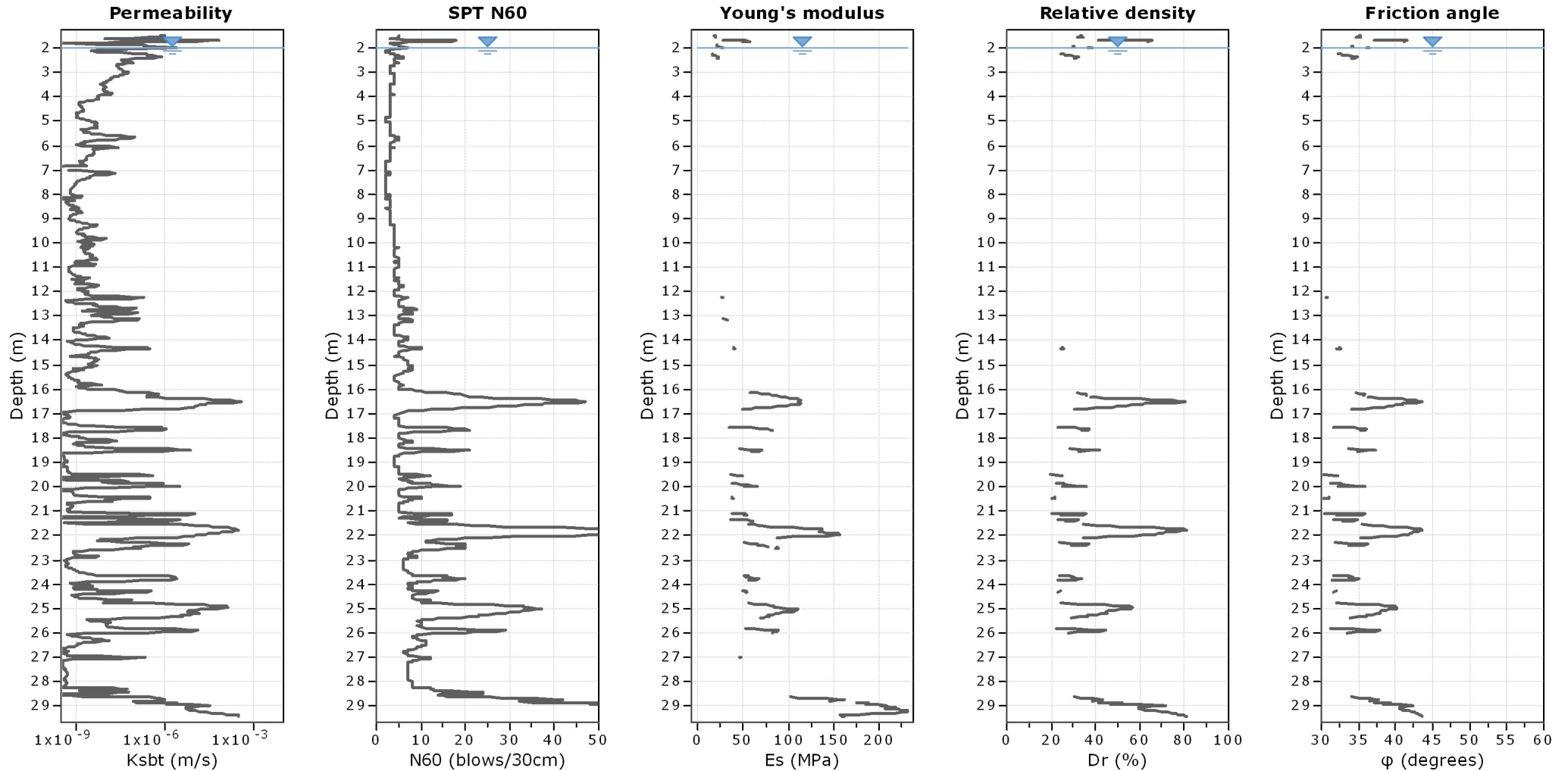


Project: Estudios Metro Bogotá
Location: CL 11 ENTRE AK 10 Y KR 11





Project: Estudios Metro Bogotá
Location: CL 11 ENTRE AK 10 Y KR 11



Calculation parameters

Permeability: Based on SBT_n

SPT N_{60} : Based on I_c and q_t

Young's modulus: Based on variable alpha using I_c (Robertson, 2009)

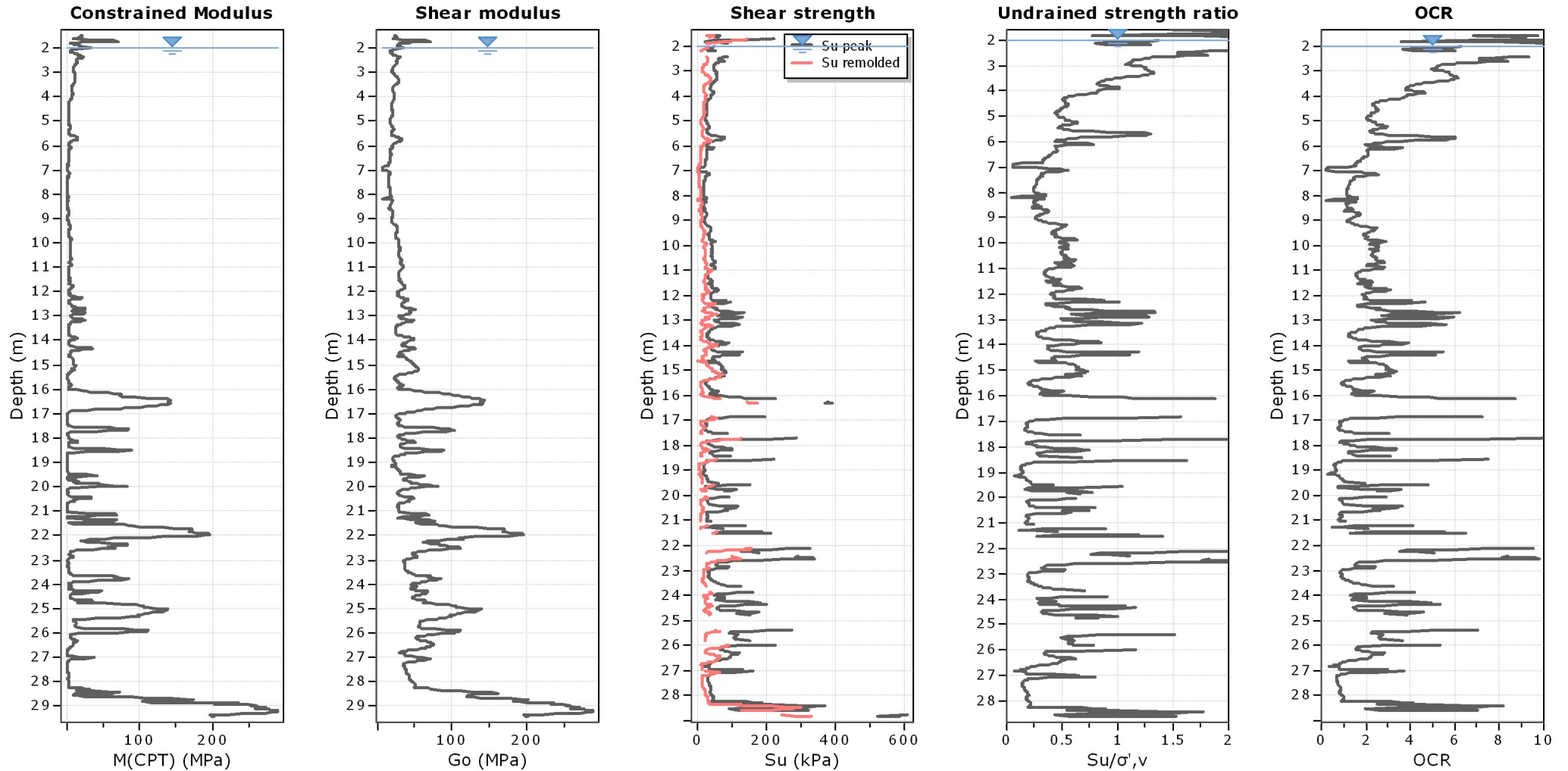
Relative density constant, C_D : 350.0

Phi: Based on Kulhawy & Mayne (1990)

● — User defined estimation data



Project: Estudios Metro Bogotá
Location: CL 11 ENTRE AK 10 Y KR 11



Calculation parameters

Constrained modulus: Based on variable α using I_c and Q_m (Robertson, 2009)

Go: Based on variable α using I_c (Robertson, 2009)

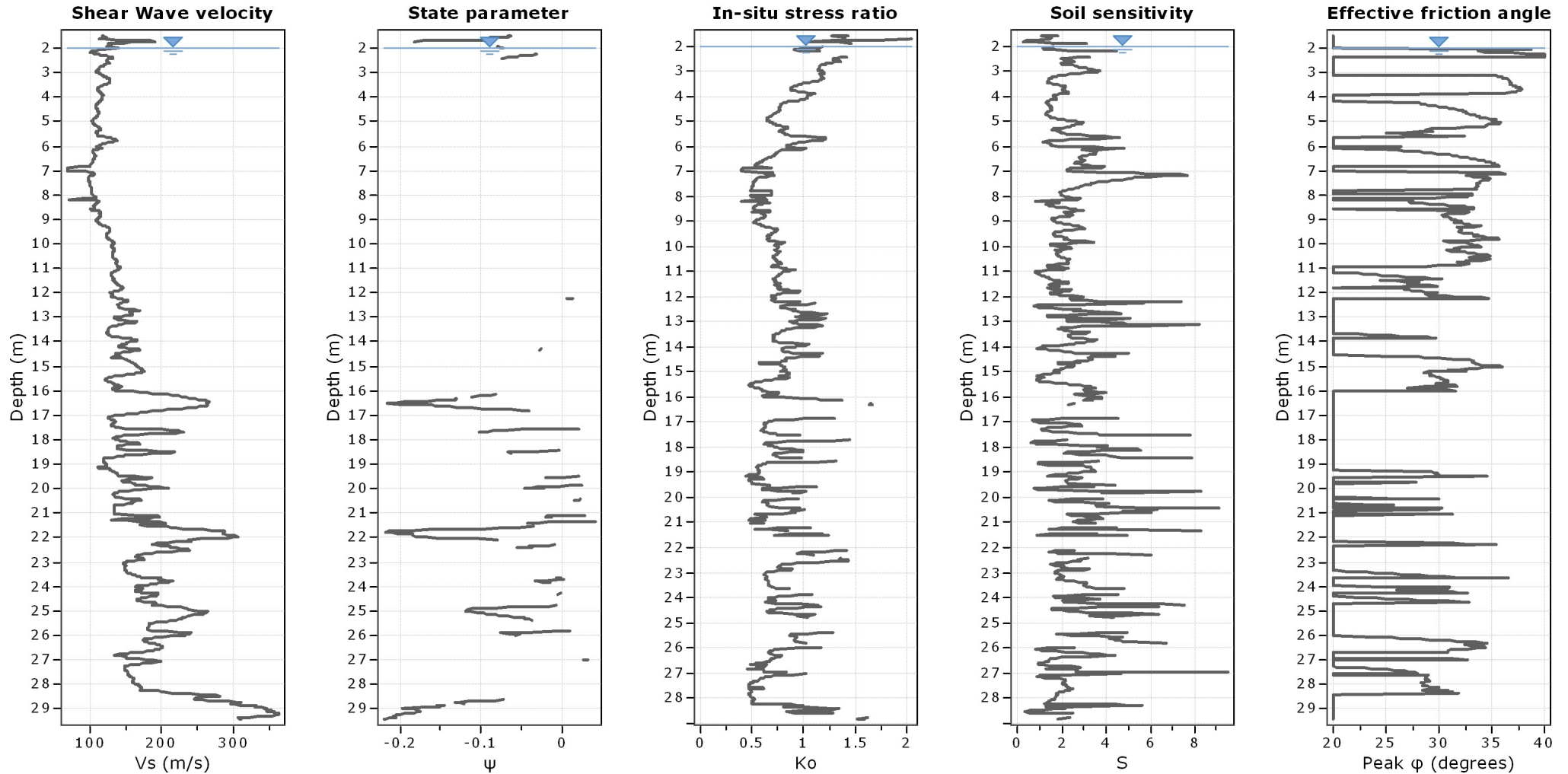
Undrained shear strength cone factor for clays, N_{kt} : 14

OCR factor for clays, N_{kt} : 0.33

● User defined estimation data



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Location: CL 11 ENTRE AK 10 Y KR 11



Calculation parameters

Soil Sensitivity factor, N_s : 7.00

● User defined estimation data

Presented below is a list of formulas used for the estimation of various soil properties. The formulas are presented in SI unit system and assume that all components are expressed in the same units.

:: Unit Weight, g (kN/m³) ::

$$g = g_w \cdot \left(0.27 \cdot \log(R_f) + 0.36 \cdot \log\left(\frac{q_t}{p_a}\right) + 1.236 \right)$$

where g_w = water unit weight

:: Permeability, k (m/s) ::

$$I_c < 3.27 \text{ and } I_c > 1.00 \text{ then } k = 10^{0.952-3.04 \cdot I_c}$$

$$I_c \leq 4.00 \text{ and } I_c > 3.27 \text{ then } k = 10^{-4.52-1.37 \cdot I_c}$$

:: N_{SPT} (blows per 30 cm) ::

$$N_{60} = \left(\frac{q_c}{p_a} \right) \cdot \frac{1}{10^{1.1268-0.2817 \cdot I_c}}$$

$$N_{1(60)} = Q_{tn} \cdot \frac{1}{10^{1.1268-0.2817 \cdot I_c}}$$

:: Young's Modulus, Es (MPa) ::

$$(q_t - \sigma_v) \cdot 0.015 \cdot 10^{0.55 \cdot I_c + 1.68}$$

(applicable only to $I_c < I_{c_cutoff}$)

:: Relative Density, Dr (%) ::

$$100 \cdot \sqrt{\frac{Q_{tn}}{k_{DR}}} \quad \text{(applicable only to SBT}_n: 5, 6, 7 \text{ and } 8 \text{ or } I_c < I_{c_cutoff})$$

:: State Parameter, ψ ::

$$\psi = 0.56 - 0.33 \cdot \log(Q_{tn,cs})$$

:: Peak drained friction angle, ϕ (°) ::

$$\phi = 17.60 + 11 \cdot \log(Q_{tn})$$

(applicable only to SBT_n: 5, 6, 7 and 8)

:: 1-D constrained modulus, M (MPa) ::

If $I_c > 2.20$
 $\alpha = 14$ for $Q_{tn} > 14$
 $\alpha = Q_{tn}$ for $Q_{tn} \leq 14$
 $M_{CPT} = \alpha \cdot (q_t - \sigma_v)$

If $I_c \leq 2.20$
 $M_{CPT} = (q_t - \sigma_v) \cdot 0.0188 \cdot 10^{0.55 \cdot I_c + 1.68}$

:: Small strain shear Modulus, Go (MPa) ::

$$G_0 = (q_t - \sigma_v) \cdot 0.0188 \cdot 10^{0.55 \cdot I_c + 1.68}$$

:: Shear Wave Velocity, Vs (m/s) ::

$$V_s = \left(\frac{G_0}{\rho} \right)^{0.50}$$

:: Undrained peak shear strength, Su (kPa) ::

$$N_{kt} = 10.50 + 7 \cdot \log(F_r) \text{ or user defined}$$

$$S_u = \frac{(q_t - \sigma_v)}{N_{kt}}$$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c_cutoff}$)

:: Remolded undrained shear strength, Su(rem) (kPa) ::

$$S_{u(rem)} = f_s \quad \text{(applicable only to SBT}_n: 1, 2, 3, 4 \text{ and } 9 \text{ or } I_c > I_{c_cutoff})$$

:: Overconsolidation Ratio, OCR ::

$$k_{OCR} = \left[\frac{Q_{tn}^{0.20}}{0.25 \cdot (10.50 + 7 \cdot \log(F_r))} \right]^{-1.25} \text{ or user defined}$$

$$OCR = k_{OCR} \cdot Q_{tn}$$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c_cutoff}$)

:: In situ Stress Ratio, Ko ::

$$K_o = (1 - \sin \phi') \cdot OCR^{\sin \phi'}$$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c_cutoff}$)

:: Soil Sensitivity, St ::

$$S_t = \frac{N_s}{F_r}$$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c_cutoff}$)

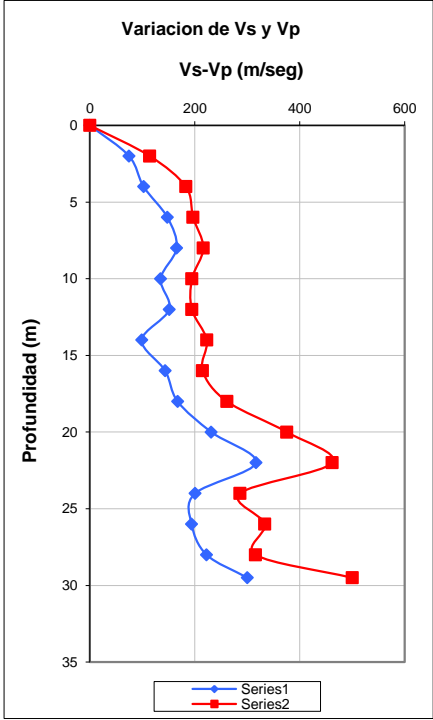
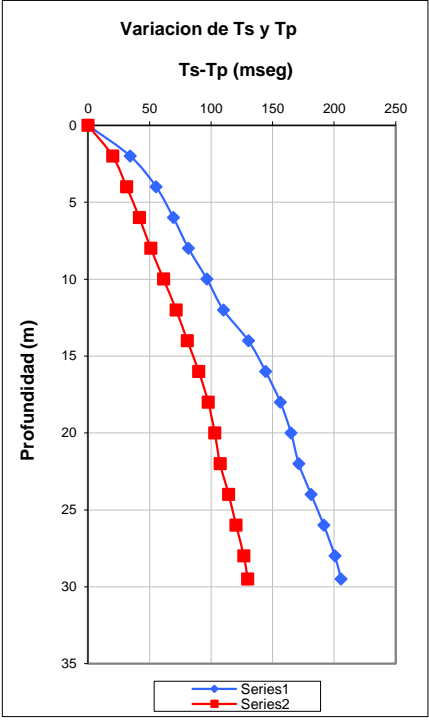
:: Effective Stress Friction Angle, ϕ' (°) ::

$$\phi' = 29.5^\circ \cdot B_q^{0.121} \cdot (0.256 + 0.336 \cdot B_q + \log Q_t)$$

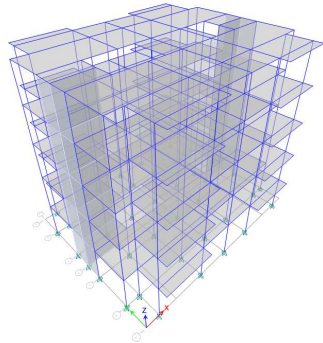
(applicable for $0.10 < B_q < 1.00$)

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- Robertson, P.K., Cabal K.L., Guide to Cone Penetration Testing for Geotechnical Engineering, Gregg Drilling & Testing, Inc., 5th Edition, November 2012
- Robertson, P.K., Interpretation of Cone Penetration Tests - a unified approach., Can. Geotech. J. 46(11): 1337–1355 (2009)



ANEXO No 2
MEMORIAS DE CÁLCULO EDIFICIO SISTEMA EN PÓRTICOS EN
CONCRETO



Project Report

Model File: EDIFICIO PORTICO, Revision 0
16/05/2022

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Structure Data

16/05/2022

1 Structure Data

This chapter provides model geometry information, including items such as story levels, point coordinates, and element connectivity.

1.1 Story Data

Table 1.1 - Story Definitions

| Tower | Name | Height m | Master Story | Similar To | Splice Story | Color |
|-------|--------|-------------|-----------------|---------------|-----------------|-----------|
| T1 | Story5 | 3 | Yes | None | No | Gray/Dark |
| T1 | Story4 | 3 | No | Story5 | No | Blue |
| T1 | Story3 | 3 | No | Story5 | No | Green |
| T1 | Story2 | 3 | No | Story5 | No | Cyan |
| T1 | Story1 | 3 | No | Story5 | No | Red |

1.2 Grid Data

Table 1.2 - Grid Definitions - General

| Tower | Name | Type | Ux m | Uy m | Rz deg | Story Range | Bubble Size mm | Color |
|-------|------|-----------|---------|---------|-----------|----------------|----------------------|-------|
| T1 | G1 | Cartesian | 0 | 0 | 0 | Default | 500 | Gray6 |

Table 1.3 - Grid Definitions - Grid Lines

| Name | Grid Line Type | ID | Ordinate m | Bubble Location | Visible |
|------|-------------------|----|---------------|--------------------|---------|
| G1 | X(Cartesian) | A | 0 | End | Yes |
| G1 | X(Cartesian) | B | 1.15 | End | Yes |
| G1 | X(Cartesian) | C | 2.8 | End | Yes |
| G1 | X(Cartesian) | D | 5.41 | End | Yes |
| G1 | X(Cartesian) | E | 8.22 | End | Yes |
| G1 | X(Cartesian) | F | 11.03 | End | Yes |
| G1 | X(Cartesian) | G | 13.64 | End | Yes |
| G1 | X(Cartesian) | H | 15.29 | End | Yes |
| G1 | X(Cartesian) | I | 16.44 | End | Yes |
| G1 | Y(Cartesian) | 1 | 0 | Start | Yes |
| G1 | Y(Cartesian) | 2 | 1.96 | Start | Yes |
| G1 | Y(Cartesian) | 3 | 5.01 | Start | Yes |
| G1 | Y(Cartesian) | 4 | 6.41 | Start | Yes |
| G1 | Y(Cartesian) | 5 | 7.81 | Start | Yes |
| G1 | Y(Cartesian) | 6 | 10.86 | Start | Yes |
| G1 | Y(Cartesian) | 7 | 12.85 | Start | Yes |

1.3 Point Coordinates

Table 1.4 - Point Bays

| Label | Is Auto Point | X m | Y m | DZBelow m |
|-------|------------------|--------|--------|--------------|
| 1 | No | 1.15 | -0.72 | 0 |
| 2 | No | 5.41 | -0.72 | 0 |
| 3 | No | 11.03 | -0.72 | 0 |
| 4 | No | 15.29 | -0.72 | 0 |
| 5 | No | 1.15 | 0 | 0 |
| 6 | No | 5.41 | 0 | 0 |
| 7 | No | 8.22 | 0 | 0 |
| 8 | No | 11.03 | 0 | 0 |
| 9 | No | 15.29 | 0 | 0 |
| 10 | No | 0 | 1.96 | 0 |
| 11 | No | 1.15 | 1.96 | 0 |
| 12 | No | 5.41 | 1.96 | 0 |
| 13 | No | 8.22 | 1.96 | 0 |
| 14 | No | 11.03 | 1.96 | 0 |
| 15 | No | 15.29 | 1.96 | 0 |
| 16 | No | 16.44 | 1.96 | 0 |
| 17 | No | 0 | 5.01 | 0 |
| 18 | No | 2.8 | 5.01 | 0 |
| 19 | No | 5.41 | 5.01 | 0 |
| 20 | No | 6.71 | 5.01 | 0 |
| 21 | No | 8.22 | 5.01 | 0 |
| 22 | No | 11.03 | 5.01 | 0 |
| 23 | No | 11.53 | 5.01 | 0 |
| 24 | No | 13.64 | 5.01 | 0 |
| 25 | No | 16.44 | 5.01 | 0 |
| 26 | No | 0 | 6.41 | 0 |
| 27 | No | 2.8 | 6.41 | 0 |
| 28 | No | 13.64 | 6.41 | 0 |
| 29 | No | 16.44 | 6.41 | 0 |
| 30 | No | 0 | 7.81 | 0 |
| 31 | No | 2.8 | 7.81 | 0 |
| 32 | No | 5.41 | 7.81 | 0 |
| 33 | No | 6.71 | 7.81 | 0 |
| 34 | No | 8.22 | 7.81 | 0 |
| 35 | No | 11.03 | 7.81 | 0 |
| 36 | No | 11.53 | 7.81 | 0 |
| 37 | No | 13.64 | 7.81 | 0 |
| 38 | No | 16.44 | 7.81 | 0 |
| 39 | Yes | 8.2755 | 6.4198 | 0 |
| 40 | Yes | 8.2698 | 6.418 | 0 |
| 41 | Yes | 8.2698 | 6.418 | 0 |
| 42 | Yes | 8.2698 | 6.418 | 0 |
| 43 | Yes | 8.2698 | 6.418 | 0 |
| 44 | No | 0 | 10.86 | 0 |
| 45 | No | 1.15 | 10.86 | 0 |

Table 1.4 - Point Bays (continued)

| Label | Is Auto Point | X m | Y m | DZBelow m |
|-------|---------------|-------|-------|-----------|
| 46 | No | 5.41 | 10.86 | 0 |
| 47 | No | 6.22 | 10.86 | 0 |
| 48 | No | 11.03 | 10.86 | 0 |
| 49 | No | 15.29 | 10.86 | 0 |
| 50 | No | 16.44 | 10.86 | 0 |
| 51 | No | 1.15 | 12.85 | 0 |
| 52 | No | 5.41 | 12.85 | 0 |
| 53 | No | 6.22 | 12.85 | 0 |
| 54 | No | 11.03 | 12.85 | 0 |
| 55 | No | 15.29 | 12.85 | 0 |
| 56 | No | 1.15 | 13.54 | 0 |
| 57 | No | 5.41 | 13.54 | 0 |
| 58 | No | 11.03 | 13.54 | 0 |
| 59 | No | 15.29 | 13.54 | 0 |

Table 1.5 - Column Bays (continued)

| Label | PointBayI | PointBayJ | IEndStory |
|-------|-----------|-----------|-----------|
| C28 | 35 | 35 | Below |
| C29 | 37 | 37 | Below |
| C30 | 38 | 38 | Below |
| C31 | 44 | 44 | Below |
| C32 | 45 | 45 | Below |
| C33 | 46 | 46 | Below |
| C34 | 47 | 47 | Below |
| C35 | 48 | 48 | Below |
| C36 | 49 | 49 | Below |
| C37 | 50 | 50 | Below |
| C38 | 51 | 51 | Below |
| C39 | 52 | 52 | Below |
| C40 | 53 | 53 | Below |
| C41 | 54 | 54 | Below |
| C42 | 55 | 55 | Below |

Table 1.6 - Beam Bays (continued)

| Label | PointBayI | PointBayJ |
|-------|-----------|-----------|
| B29 | 19 | 21 |
| B30 | 21 | 22 |
| B31 | 22 | 24 |
| B32 | 24 | 25 |
| B33 | 17 | 26 |
| B34 | 18 | 27 |
| B35 | 24 | 28 |
| B36 | 25 | 29 |
| B37 | 26 | 27 |
| B38 | 20 | 33 |
| B39 | 21 | 34 |
| B40 | 22 | 35 |
| B41 | 23 | 36 |
| B42 | 28 | 29 |
| B43 | 26 | 30 |
| B44 | 27 | 31 |
| B45 | 28 | 37 |
| B46 | 29 | 38 |
| B47 | 30 | 31 |
| B48 | 31 | 32 |
| B49 | 32 | 34 |
| B50 | 34 | 35 |
| B51 | 35 | 37 |
| B52 | 37 | 38 |
| B53 | 30 | 44 |
| B54 | 32 | 46 |
| B55 | 34 | 47 |
| B56 | 35 | 48 |
| B57 | 38 | 50 |
| B58 | 44 | 45 |
| B59 | 45 | 46 |
| B60 | 46 | 47 |
| B61 | 47 | 48 |
| B62 | 48 | 49 |
| B63 | 49 | 50 |
| B64 | 45 | 51 |
| B65 | 46 | 52 |
| B66 | 47 | 53 |
| B67 | 48 | 54 |
| B68 | 49 | 55 |
| B69 | 51 | 52 |
| B70 | 52 | 53 |
| B71 | 53 | 54 |
| B72 | 54 | 55 |
| B73 | 51 | 56 |
| B74 | 52 | 57 |

1.4 Line Connectivity

Table 1.5 - Column Bays

| Label | PointBayI | PointBayJ | IEndStory |
|-------|-----------|-----------|-----------|
| C1 | 5 | 5 | Below |
| C2 | 6 | 6 | Below |
| C3 | 7 | 7 | Below |
| C4 | 8 | 8 | Below |
| C5 | 9 | 9 | Below |
| C6 | 10 | 10 | Below |
| C7 | 11 | 11 | Below |
| C8 | 12 | 12 | Below |
| C9 | 13 | 13 | Below |
| C10 | 14 | 14 | Below |
| C11 | 15 | 15 | Below |
| C12 | 16 | 16 | Below |
| C13 | 17 | 17 | Below |
| C14 | 18 | 18 | Below |
| C15 | 19 | 19 | Below |
| C16 | 21 | 21 | Below |
| C17 | 22 | 22 | Below |
| C18 | 24 | 24 | Below |
| C19 | 25 | 25 | Below |
| C20 | 26 | 26 | Below |
| C21 | 27 | 27 | Below |
| C22 | 28 | 28 | Below |
| C23 | 29 | 29 | Below |
| C24 | 30 | 30 | Below |
| C25 | 31 | 31 | Below |
| C26 | 32 | 32 | Below |
| C27 | 34 | 34 | Below |

Table 1.6 - Beam Bays

| Label | PointBayI | PointBayJ |
|-------|-----------|-----------|
| B1 | 1 | 2 |
| B2 | 3 | 4 |
| B3 | 1 | 5 |
| B4 | 2 | 6 |
| B5 | 3 | 8 |
| B6 | 4 | 9 |
| B7 | 5 | 6 |
| B8 | 6 | 7 |
| B9 | 7 | 8 |
| B10 | 8 | 9 |
| B11 | 5 | 11 |
| B12 | 6 | 12 |
| B13 | 7 | 13 |
| B14 | 8 | 14 |
| B15 | 9 | 15 |
| B16 | 10 | 11 |
| B17 | 11 | 12 |
| B18 | 12 | 13 |
| B19 | 13 | 14 |
| B20 | 14 | 15 |
| B21 | 15 | 16 |
| B22 | 10 | 17 |
| B23 | 12 | 19 |
| B24 | 13 | 21 |
| B25 | 14 | 22 |
| B26 | 16 | 25 |
| B27 | 17 | 18 |
| B28 | 18 | 19 |

Table 1.6 - Beam Bays (continued)

| Label | PointBayI | PointBayJ |
|-------|-----------|-----------|
| B75 | 54 | 58 |
| B76 | 55 | 59 |
| B77 | 56 | 57 |
| B78 | 58 | 59 |

Table 1.7 - Floor Bays (continued)

| Label | NumPoints | PointNumber | PointBay |
|-------|-----------|-------------|----------|
| F10 | 2 | 16 | |
| F10 | 3 | 25 | |
| F10 | 4 | 22 | |
| F11 | 4 | 17 | |
| F11 | 2 | 18 | |
| F11 | 3 | 27 | |
| F11 | 4 | 26 | |
| F12 | 4 | 1 | 24 |
| F12 | 2 | 25 | |
| F12 | 3 | 29 | |
| F12 | 4 | 28 | |
| F13 | 4 | 1 | 20 |
| F13 | 2 | 21 | |
| F13 | 3 | 34 | |
| F13 | 4 | 33 | |
| F14 | 4 | 1 | 21 |
| F14 | 2 | 22 | |
| F14 | 3 | 35 | |
| F14 | 4 | 34 | |
| F15 | 4 | 1 | 22 |
| F15 | 2 | 23 | |
| F15 | 3 | 36 | |
| F15 | 4 | 35 | |
| F16 | 4 | 1 | 26 |
| F16 | 2 | 27 | |
| F16 | 3 | 31 | |
| F16 | 4 | 30 | |
| F17 | 4 | 1 | 28 |
| F17 | 2 | 29 | |
| F17 | 3 | 38 | |
| F17 | 4 | 37 | |
| F18 | 4 | 1 | 30 |
| F18 | 2 | 32 | |
| F18 | 3 | 46 | |
| F18 | 4 | 44 | |
| F19 | 4 | 1 | 32 |
| F19 | 2 | 34 | |
| F19 | 3 | 47 | |
| F19 | 4 | 46 | |
| F20 | 4 | 1 | 34 |
| F20 | 2 | 35 | |
| F20 | 3 | 48 | |
| F20 | 4 | 47 | |
| F21 | 4 | 1 | 35 |
| F21 | 2 | 38 | |
| F21 | 3 | 50 | |

Table 1.7 - Floor Bays (continued)

| Label | NumPoints | PointNumber | PointBay |
|-------|-----------|-------------|----------|
| F21 | 4 | 4 | 48 |
| F22 | 4 | 1 | 45 |
| F22 | 2 | 46 | |
| F22 | 3 | 52 | |
| F22 | 4 | 51 | |
| F23 | 4 | 1 | 46 |
| F23 | 2 | 47 | |
| F23 | 3 | 53 | |
| F23 | 4 | 52 | |
| F24 | 4 | 1 | 47 |
| F24 | 2 | 48 | |
| F24 | 3 | 54 | |
| F24 | 4 | 53 | |
| F25 | 4 | 1 | 48 |
| F25 | 2 | 49 | |
| F25 | 3 | 55 | |
| F25 | 4 | 54 | |
| F26 | 4 | 1 | 51 |
| F26 | 2 | 52 | |
| F26 | 3 | 57 | |
| F26 | 4 | 56 | |
| F27 | 4 | 1 | 54 |
| F27 | 2 | 55 | |
| F27 | 3 | 59 | |
| F27 | 4 | 58 | |

1.5 Area Connectivity

Table 1.7 - Floor Bays

| Label | NumPoints | PointNumber | PointBay |
|-------|-----------|-------------|----------|
| F1 | 4 | 1 | 1 |
| F1 | 2 | 2 | |
| F1 | 3 | 6 | |
| F1 | 4 | 5 | |
| F2 | 4 | 1 | 3 |
| F2 | 2 | 4 | |
| F2 | 3 | 9 | |
| F2 | 4 | 8 | |
| F3 | 4 | 1 | 5 |
| F3 | 2 | 6 | |
| F3 | 3 | 12 | |
| F3 | 4 | 11 | |
| F4 | 4 | 1 | 6 |
| F4 | 2 | 7 | |
| F4 | 3 | 13 | |
| F4 | 4 | 12 | |
| F5 | 4 | 1 | 7 |
| F5 | 2 | 8 | |
| F5 | 3 | 14 | |
| F5 | 4 | 13 | |
| F6 | 4 | 1 | 8 |
| F6 | 2 | 9 | |
| F6 | 3 | 15 | |
| F6 | 4 | 14 | |
| F7 | 4 | 1 | 10 |
| F7 | 2 | 12 | |
| F7 | 3 | 19 | |
| F7 | 4 | 17 | |
| F8 | 4 | 1 | 12 |
| F8 | 2 | 13 | |
| F8 | 3 | 21 | |
| F8 | 4 | 19 | |
| F9 | 4 | 1 | 13 |
| F9 | 2 | 14 | |
| F9 | 3 | 22 | |
| F9 | 4 | 21 | |
| F10 | 4 | 1 | 14 |

Table 1.8 - Wall Bays

| Label | NumPoints | PointNumber | PointBay | PointStory |
|-------|-----------|-------------|----------|------------|
| W1 | 4 | 1 | 26 | Below |
| W1 | 2 | 17 | | Below |
| W1 | 3 | 17 | | Same |
| W1 | 4 | 26 | | Same |
| W2 | 4 | 1 | 29 | Below |
| W2 | 2 | 25 | | Below |
| W2 | 3 | 25 | | Same |
| W2 | 4 | 29 | | Same |
| W3 | 4 | 1 | 27 | Below |
| W3 | 2 | 26 | | Below |
| W3 | 3 | 26 | | Same |
| W3 | 4 | 27 | | Same |
| W4 | 4 | 1 | 29 | Below |
| W4 | 2 | 28 | | Below |
| W4 | 3 | 28 | | Same |
| W4 | 4 | 29 | | Same |
| W5 | 4 | 1 | 30 | Below |
| W5 | 2 | 26 | | Below |

Table 1.8 - Wall Bays (continued)

Table with 5 columns: Label, NumPoints, PointNumber, PointBay, PointStory. Rows include WS, W5, W6, W7, W8.

1.6 Mass

Table 1.9 - Mass Source Definition

Table with 11 columns: Name, Is Default, Include Lateral Mass?, Include Vertical Mass?, Lump Mass?, Source Self Mass?, Source Added Mass?, Source Load Patterns?, Move Mass Centroid?, Load Pattern, Multiplier.

Table 1.10 - Centers Of Mass And Rigidity

Table with 11 columns: Story, Diaphragm, Mass X kg, Mass Y kg, XCM m, YCM m, Cum Mass X kg, Cum Mass Y kg, XCCM m, YCCM m, XCR m, YCR m.

Table 1.11 - Mass Summary by Diaphragm

Table with 6 columns: Story, Diaphragm, Mass X kg, Mass Y kg, Mass Moment of Inertia ton-m2, X Mass Center m, Y Mass Center m.

Table 1.12 - Mass Summary by Story

Table with 4 columns: Story, UX kg, UY kg, UZ kg.

Table 1.13 - Mass Summary by Group

Table with 6 columns: Group, Self Mass kg, Self Weight kN, Mass X kg, Mass Y kg, Mass Z kg.

1.7 Groups

Table 1.14 - Group Definitions

Table with 5 columns: Name, Color, Steel Design?, Concrete Design?, Composite Design?.

2 Properties

This chapter provides property information for materials, frame sections, shell sections, and links.

2.1 Materials

Table 2.1 - Material Properties - General

Table with 6 columns: Material, Type, SymType, Grade, Color, Notes.

2.2 Frame Sections

Table 2.2 - Frame Section Property Definitions - Summary (Part 1 of 3)

Table with 11 columns: Name, Material, Shape, Color, Area cm2, J cm4, I33 cm4, I22 cm4, As2 cm2, As3 cm2.

Table 2.2 - Frame Section Property Definitions - Summary (Part 2 of 3)

Table with 13 columns: S33Pos cm3, S33Neg cm3, S22Pos cm3, S22Neg cm3, Z33 cm3, Z22 cm3, R33 mm, R22 mm, Cw cm6, CG Offset 3 mm, CG Offset 2 mm, PNA Offset 3 mm, PNA Offset 2 mm.

Table 2.2 - Frame Section Property Definitions - Summary (Part 3 of 3)

Table with 8 columns: As2 Modifier, As3 Modifier, J Modifier, I33 Modifier, I22 Modifier, Mass Modifier, Weight Modifier.

2.3 Shell Sections

Table 2.3 - Area Section Property Definitions - Summary

Table with 6 columns: Name, Type, Element Type, Material, Total Thickness mm, Deck Material, Deck Depth mm.

2.4 Reinforcement Sizes

Table 2.4 - Reinforcing Bar Sizes

Table with 3 columns: Name, Diameter mm, Area cm2.

Table 2.4 - Reinforcing Bar Sizes (continued)

Table with 3 columns: Name, Diameter mm, Area cm2.

2.5 Links

Table 2.5 - Link Property Definitions - Summary

Table with 6 columns: Name, Type, Degrees of Freedom, Mass kg, Weight kN, Defined Length m, Defined Area m2.

2.6 Tendon Sections

Table 2.6 - Tendon Section Properties

Table with 5 columns: Name, Material, StrandArea cm2, Color, Notes.

3 Assignments

This chapter provides a listing of the assignments applied to the model.

3.1 Joint Assignments

Table 3.1 - Joint Assignments - Summary

Table with 5 columns: Story, Label, UniqueName, Diaphragm, Restraints.

Table 3.1 - Joint Assignments - Summary (continued)

Table with 5 columns: Story, Label, UniqueName, Diaphragm, Restraints. Rows include Story5 (48-59), Story4 (1-33).

Table 3.1 - Joint Assignments - Summary (continued)

Table with 5 columns: Story, Label, UniqueName, Diaphragm, Restraints. Rows include Story4 (34-57), Story3 (1-24).

Table 3.1 - Joint Assignments - Summary (continued)

Table with 5 columns: Story, Label, UniqueName, Diaphragm, Restraints. Rows include Story3 (25-54), Story2 (1-15).

Table 3.1 - Joint Assignments - Summary (continued)

Table with 5 columns: Story, Label, UniqueName, Diaphragm, Restraints. Rows include Story2 (16-34), Story1 (1-6).

Table 3.1 - Joint Assignments - Summary (continued)

Table with 5 columns: Story, Label, UniqueName, Diaphragm, Restraints. Rows include Story1 (7-57).

Table 3.1 - Joint Assignments - Summary (continued)

Table with 5 columns: Story, Label, UniqueName, Diaphragm, Restraints. Rows include Story1 (58-65), Base (6-55).

3.2 Frame Assignments

Table 3.2 - Frame Assignments - Summary

Table with 9 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story5 B1-B20 and Story6 B1-B20.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 9 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story6 B21-B40 and Story7 C1-C20.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 9 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story7 C21-C40 and Story8 B1-B20.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 9 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story8 B21-B40 and Story9 C1-C20.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 9 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story9 C21-C40 and Story10 B1-B20.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 9 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story10 B21-B40 and Story11 C1-C20.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 9 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story 823-866.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 9 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story 867-932.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 9 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story 933-984.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 9 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story 935-986.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 9 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story 937-1002.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 9 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story 1003-1054.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 8 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story1 beams 847-860 and Story1 columns C1-C12.

Table 3.2 - Frame Assignments - Summary (continued)

Table with 8 columns: Story, Label, UniqueName, Design Type, Length m, Analysis Section, Design Section, Max Station Spacing m, Min Number Stations. Rows include Story1 columns C13-C42.

3.3 Shell Assignments

Table 3.3 - Area Assignments - Summary

Table with 5 columns: Story, Label, UniqueName, Section Property, Axis Angle deg. Rows include Story5 areas F1-F7.

Table 3.3 - Area Assignments - Summary (continued)

Table with 5 columns: Story, Label, UniqueName, Section Property, Property Type, Axis Angle deg. Rows include Story5 areas F8-F18 and Story4 areas F1-F18.

Table 3.3 - Area Assignments - Summary (continued)

Table with 5 columns: Story, Label, UniqueName, Section Property, Axis Angle deg. Rows include Story4 areas F19-F25, Story4 walls W1-W6, Story3 areas F1-F19, and Story3 walls W1-W6.

Table 3.3 - Area Assignments - Summary (continued)

Table with 5 columns: Story, Label, UniqueName, Section Property, Property Type, Axis Angle deg. Rows include Story3 walls W3-W6, Story2 areas F1-F23, Story2 walls W1-W6, and Story1 areas F1-F7.

Table 3.3 - Area Assignments - Summary (continued)

Table with 5 columns: Story, Label, UniqueName, Section Property, Property Type, Axis Angle deg. Rows include Story1 areas F8-F18 and Story1 walls W1-W6.

4 Loads

This chapter provides loading information as applied to the model.

4.1 Load Patterns

Table 4.1 - Load Pattern Definitions

| Name | Is Auto Load | Type | Self Weight Multiplier | Auto Load |
|------------|--------------|---------|------------------------|------------------|
| ~LRF | Yes | Other | 0 | |
| ~SISMOXECC | Yes | Other | 0 | |
| ~SISMOYECC | Yes | Other | 0 | |
| Muerta | No | Dead | 0 | |
| Pfhpico | No | Dead | 1 | |
| SismoX FHE | No | Seismic | 0 | User Coefficient |
| SismoY FHE | No | Seismic | 0 | User Coefficient |
| Viva | No | Live | 0 | |

4.2 Auto Seismic Loading

User Coefficient Auto Seismic Load Calculation

This calculation presents the automatically generated lateral seismic loads for load pattern SismoX FHE using the user input coefficients, as calculated by ETABS.

Direction and Eccentricity

Direction = X

Factors and Coefficients

Equivalent Lateral Forces

Base Shear Coefficient, C

Base Shear, V

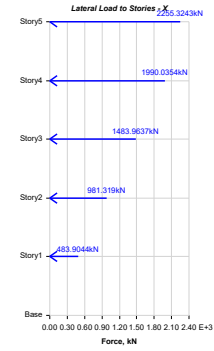
Calculated Base Shear

V = CW

C = 0.7312

| Direction | Period Used (sec) | C | W (kN) | V (kN) |
|-----------|-------------------|---|-----------|-----------|
| X | 0 | 0 | 9839.3694 | 7194.5469 |

Applied Story Forces



| Story | Elevation | X-Dir | Y-Dir |
|--------|-----------|-----------|-------|
| | m | kN | kN |
| Story5 | 15 | 2255.3243 | 0 |
| Story4 | 12 | 1990.0354 | 0 |
| Story3 | 9 | 1483.9637 | 0 |
| Story2 | 6 | 981.319 | 0 |
| Story1 | 3 | 483.9044 | 0 |
| Base | 0 | 0 | 0 |

User Coefficient Auto Seismic Load Calculation

This calculation presents the automatically generated lateral seismic loads for load pattern SismoY FHE using the user input coefficients, as calculated by ETABS.

Direction and Eccentricity

Direction = Y

Factors and Coefficients

Equivalent Lateral Forces

Base Shear Coefficient, C

Base Shear, V

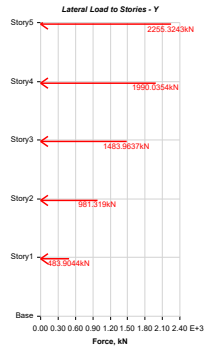
Calculated Base Shear

V = CW

C = 0.7312

| Direction | Period Used (sec) | C | W (kN) | V (kN) |
|-----------|-------------------|---|-----------|-----------|
| Y | 0 | 0 | 9839.3694 | 7194.5469 |

Applied Story Forces



| Story | Elevation | X-Dir | Y-Dir |
|--------|-----------|-------|-----------|
| | m | kN | kN |
| Story5 | 15 | 0 | 2255.3243 |
| Story4 | 12 | 0 | 1990.0354 |
| Story3 | 9 | 0 | 1483.9637 |
| Story2 | 6 | 0 | 981.319 |
| Story1 | 3 | 0 | 483.9044 |
| Base | 0 | 0 | 0 |

4.3 Applied Loads

4.3.1 Area Loads

Table 4.4 - Area Load Assignments - Uniform

| Story | Label | UniqueName | Load Pattern | Direction | Load kN/m2 |
|--------|-------|------------|--------------|-----------|------------|
| Story5 | F1 | 29 | Viva | Gravity | 1.8 |
| Story5 | F2 | 33 | Viva | Gravity | 1.8 |
| Story5 | F3 | 30 | Viva | Gravity | 1.8 |
| Story5 | F4 | 31 | Viva | Gravity | 1.8 |
| Story5 | F5 | 32 | Viva | Gravity | 1.8 |
| Story5 | F6 | 34 | Viva | Gravity | 1.8 |
| Story5 | F7 | 36 | Viva | Gravity | 1.8 |
| Story5 | F8 | 37 | Viva | Gravity | 1.8 |
| Story5 | F9 | 38 | Viva | Gravity | 1.8 |
| Story5 | F10 | 35 | Viva | Gravity | 1.8 |
| Story5 | F11 | 39 | Viva | Gravity | 1.8 |
| Story5 | F12 | 42 | Viva | Gravity | 1.8 |
| Story5 | F13 | 54 | Viva | Gravity | 1.8 |
| Story5 | F14 | 41 | Viva | Gravity | 1.8 |
| Story5 | F15 | 55 | Viva | Gravity | 1.8 |
| Story5 | F16 | 40 | Viva | Gravity | 1.8 |
| Story5 | F17 | 43 | Viva | Gravity | 1.8 |
| Story5 | F18 | 45 | Viva | Gravity | 1.8 |
| Story5 | F19 | 46 | Viva | Gravity | 1.8 |
| Story5 | F20 | 47 | Viva | Gravity | 1.8 |
| Story5 | F21 | 44 | Viva | Gravity | 1.8 |
| Story5 | F22 | 48 | Viva | Gravity | 1.8 |
| Story5 | F23 | 50 | Viva | Gravity | 1.8 |
| Story5 | F24 | 51 | Viva | Gravity | 1.8 |
| Story5 | F25 | 52 | Viva | Gravity | 1.8 |
| Story5 | F26 | 49 | Viva | Gravity | 1.8 |
| Story5 | F27 | 53 | Viva | Gravity | 1.8 |
| Story4 | F1 | 56 | Viva | Gravity | 1.8 |
| Story4 | F2 | 60 | Viva | Gravity | 1.8 |
| Story4 | F3 | 57 | Viva | Gravity | 1.8 |
| Story4 | F4 | 58 | Viva | Gravity | 1.8 |
| Story4 | F5 | 59 | Viva | Gravity | 1.8 |
| Story4 | F6 | 61 | Viva | Gravity | 1.8 |
| Story4 | F7 | 63 | Viva | Gravity | 1.8 |
| Story4 | F8 | 64 | Viva | Gravity | 1.8 |
| Story4 | F9 | 65 | Viva | Gravity | 1.8 |
| Story4 | F10 | 62 | Viva | Gravity | 1.8 |
| Story4 | F11 | 66 | Viva | Gravity | 1.8 |
| Story4 | F12 | 69 | Viva | Gravity | 1.8 |
| Story4 | F13 | 61 | Viva | Gravity | 1.8 |
| Story4 | F14 | 68 | Viva | Gravity | 1.8 |
| Story4 | F15 | 62 | Viva | Gravity | 1.8 |

Table 4.4 - Area Load Assignments - Uniform (continued)

Table with 6 columns: Story, Label, UniqueName, Load Pattern, Direction, Load kN/m2. Rows include Story4 (F16-F28), Story3 (F1-F12), Story0 (F13-F25), Story2 (F1-F6).

Table 4.4 - Area Load Assignments - Uniform (continued)

Table with 6 columns: Story, Label, UniqueName, Load Pattern, Direction, Load kN/m2. Rows include Story2 (F7-F27), Story1 (F1-F6), Story0 (F7-F15), Story4 (F16-F24).

Table 4.4 - Area Load Assignments - Uniform (continued)

Table with 6 columns: Story, Label, UniqueName, Load Pattern, Direction, Load kN/m2. Rows include Story1 (F25-F32), Story5 (F1-F15), Story6 (F16-F32), Story4 (F1-F15).

Table 4.4 - Area Load Assignments - Uniform (continued)

Table with 6 columns: Story, Label, UniqueName, Load Pattern, Direction, Load kN/m2. Rows include Story4 (F16-F28), Story3 (F1-F12), Story0 (F13-F25), Story2 (F1-F6).

Table 4.4 - Area Load Assignments - Uniform (continued)

Table with 6 columns: Story, Label, UniqueName, Load Pattern, Direction, Load kN/m2. Rows include Story2 (F7-F27), Story1 (F1-F6), Story0 (F7-F15), Story4 (F16-F24).

Table 4.4 - Area Load Assignments - Uniform (continued)

Table with 6 columns: Story, Label, UniqueName, Load Pattern, Direction, Load kN/m2. Rows include Story1 (F25-F32), Story1 (F27).

4.4 Functions

4.4.1 Response Spectrum Functions

Table 4.5 - Functions - Response Spectrum - Columbia NSR-10

Table with 11 columns: Name, Period sec, Value, Aa, Av, Ae, Ad, Group of Use, Fa, Fv, Damping Ratio. Rows list various spectral functions like ESPECTRO BOGOTÁ PIEDEMONTE B with associated parameters.

Table 5.3 - Diaphragm Center Of Mass Displacements (Part 1 of 2, continued)

Table with columns: Story, Diaphragm, Output Case, Case Type, Step Type, UX m, UY m, RZ rad, Point, X m. Rows include Story1 D1 EX CORREGIDO, Story1 D1 EY CORREGIDO, Story1 D1 EY CORREGIDO, Story1 D1 DERY, Story1 D1 EX DISEÑO, Story1 D1 EY DISEÑO, Story1 D1 1.2D+1.0EY+0.3EX+1.0L, Story1 D1 1.2D+1.0EY+0.3EX+1.0L.

Table 5.3 - Diaphragm Center Of Mass Displacements (Part 2 of 2)

Table with columns: Y m, Z m. Rows show values for Y and Z across multiple diaphragms.

Table 5.3 - Diaphragm Center Of Mass Displacements (Part 2 of 2, continued)

Table with columns: Y m, Z m. Rows show values for Y and Z across multiple diaphragms.

Table 5.3 - Diaphragm Center Of Mass Displacements (Part 2 of 2, continued)

Table with columns: Y m, Z m. Rows show values for Y and Z across multiple diaphragms.

Table 5.3 - Diaphragm Center Of Mass Displacements (Part 2 of 2, continued)

Table with columns: Y m, Z m. Rows show values for Y and Z across multiple diaphragms.

5.2 Story Results

Table 5.4 - Story Max Over Avg Displacements

Table with columns: Story, Output Case, Case Type, Step Type, Direction, Maximum m, Average m, Ratio. Rows include Story5 PPropio, Story4 PPropio, Story3 PPropio, Story2 PPropio, Story1 PPropio, Story5 Viva, Story4 Viva, Story3 Viva, Story2 Viva, Story1 Viva, Story5 Muerta, Story4 Muerta, Story3 Muerta, Story2 Muerta, Story1 Muerta.

Table 5.4 - Story Max Over Avg Displacements (continued)

Table with columns: Story, Output Case, Case Type, Step Type, Direction, Maximum m, Average m, Ratio. Rows include Story1 Muerta, Story5 SismoX FHE, Story4 SismoX FHE, Story3 SismoX FHE, Story2 SismoX FHE, Story1 SismoX FHE, Story5 SismoY FHE, Story4 SismoY FHE, Story3 SismoY FHE, Story2 SismoY FHE, Story1 SismoY FHE, Story5 SISMOX, Story4 SISMOX, Story3 SISMOX, Story2 SISMOX, Story1 SISMOX, Story5 MUERTA TOTAL, Story4 MUERTA TOTAL, Story3 MUERTA TOTAL, Story2 MUERTA TOTAL, Story1 MUERTA TOTAL, Story5 EX CORREGIDO, Story4 EX CORREGIDO, Story3 EX CORREGIDO, Story2 EX CORREGIDO, Story1 EX CORREGIDO, Story5 EX CORREGIDO, Story4 EX CORREGIDO, Story3 EX CORREGIDO, Story2 EX CORREGIDO, Story1 EX CORREGIDO.

Table 5.4 - Story Max Over Avg Displacements (continued)

Table with columns: Story, Output Case, Case Type, Step Type, Direction, Maximum m, Average m, Ratio. Rows include Story1 EY CORREGIDO, Story4 EY CORREGIDO, Story3 EY CORREGIDO, Story2 EY CORREGIDO, Story1 EY CORREGIDO, Story5 DERY, Story4 DERY, Story3 DERY, Story2 DERY, Story1 DERY, Story5 EX DISEÑO, Story4 EX DISEÑO, Story3 EX DISEÑO, Story2 EX DISEÑO, Story1 EX DISEÑO, Story5 EY DISEÑO, Story4 EY DISEÑO, Story3 EY DISEÑO, Story2 EY DISEÑO, Story1 EY DISEÑO.

Table 5.6 - Story Max Over Avg Drifts (continued)

Table with 8 columns: Story, Output Case, Case Type, Step Type, Direction, Max Drift m, Avg Drift m, Ratio. Contains data for stories 1 to 30.

Table 5.6 - Story Max Over Avg Drifts (continued)

Table with 8 columns: Story, Output Case, Case Type, Step Type, Direction, Max Drift m, Avg Drift m, Ratio. Contains data for stories 31 to 60.

Table 5.6 - Story Max Over Avg Drifts (continued)

Table with 8 columns: Story, Output Case, Case Type, Step Type, Direction, Max Drift m, Avg Drift m, Ratio. Contains data for stories 61 to 90.

Table 5.7 - Story Forces (Part 1 of 2)

Table with 10 columns: Story, Output Case, Case Type, Step Type, Location, P kN, Vx kN, Vy kN, Vz kN, M kN-m. Contains data for stories 5 to 6.

Table 5.7 - Story Forces (Part 1 of 2, continued)

Table with 10 columns: Story, Output Case, Case Type, Step Type, Location, P kN, Vx kN, Vy kN, Vz kN, T kN-m. Contains data for stories 7 to 30.

Table 5.7 - Story Forces (Part 1 of 2, continued)

Table with 10 columns: Story, Output Case, Case Type, Step Type, Location, P kN, Vx kN, Vy kN, Vz kN, T kN-m. Contains data for stories 31 to 60.

Table 5.7 - Story Forces (Part 1 of 2, continued)

Table with 10 columns: Story, Output Case, Case Type, Step Type, Location, P kN, Vx kN, Vy kN, Vz kN, T kN-m. Contains data for stories 61 to 90.

Table 5.7 - Story Forces (Part 1 of 2, continued)

Table with 11 columns: Story, Output Case, Case Type, Step Type, Location, P, N, VX, VY, T, kN-m. Rows include various story levels and output cases like EY DISEÑO, 1.2D+1.0E+0.3E+1.0L, etc.

Table 5.7 - Story Forces (Part 1 of 2, continued)

Table with 11 columns: Story, Output Case, Case Type, Step Type, Location, P, N, VX, VY, T, kN-m. Rows include various story levels and output cases like EX DISEÑO, 1.2D+1.0E+0.3E+1.0L, etc.

Table 5.7 - Story Forces (Part 1 of 2, continued)

Table with 11 columns: Story, Output Case, Case Type, Step Type, Location, P, N, VX, VY, T, kN-m. Rows include various story levels and output cases like DERY, 1.2D+1.0E+0.3E+1.0L, etc.

Table 5.7 - Story Forces (Part 2 of 2)

Table with 3 columns: MX kN-m, MY kN-m, and values. Rows include various story levels and output cases like 1.0D+1.0L, 1.2D+1.0E+0.3E+1.0L, etc.

Table 5.7 - Story Forces (Part 2 of 2, continued)

Table with 2 columns: MX kN-m, MY kN-m, and values. Rows include various story levels and output cases like 0, 720.7595, -7200.7595, etc.

Table 5.7 - Story Forces (Part 2 of 2, continued)

Table with 2 columns: MX kN-m, MY kN-m, and values. Rows include various story levels and output cases like 25.746.624, -3320.0284, 0.3655, etc.

Table 5.7 - Story Forces (Part 2 of 2, continued)

Table with 2 columns: MX kN-m, MY kN-m, and values. Rows include various story levels and output cases like 0.8009, 16264.1601, 1.4211, etc.

Table 5.7 - Story Forces (Part 2 of 2, continued)

Table with 4 columns: MX (kN-m), MY (kN-m), and two unlabeled columns. Rows list various structural elements and their corresponding force values.

Table 5.7 - Story Forces (Part 2 of 2, continued)

Table with 4 columns: MX (kN-m), MY (kN-m), and two unlabeled columns. Rows list various structural elements and their corresponding force values.

Table 5.7 - Story Forces (Part 2 of 2, continued)

Table with 4 columns: MX (kN-m), MY (kN-m), and two unlabeled columns. Rows list various structural elements and their corresponding force values.

5.3 Point Results

Table 5.8 - Joint Reactions (Part 1 of 2)

Table with 10 columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX (kN), FY (kN), FZ (kN), MX (kN-m). Rows list joint reactions for various stories and cases.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with 10 columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX (kN), FY (kN), FZ (kN), MX (kN-m). Rows list joint reactions for various stories and cases.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with 10 columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX (kN), FY (kN), FZ (kN), MX (kN-m). Rows list joint reactions for various stories and cases.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with 10 columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX (kN), FY (kN), FZ (kN), MX (kN-m). Rows list joint reactions for various stories and cases.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various structural members.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various structural members.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various structural members.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various structural members.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various structural members.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various structural members.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various cases like DERY, EY DISENO, MUERTA TOTAL, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various cases like EY CORREGIDO, DERY, EY DISENO, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various cases like SISMOX, MUERTA TOTAL, EY CORREGIDO, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various cases like PPropio, Muerta, SismoX FHE, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various cases like 1.2D+1.0E+0.3E+1.0L, 1.0D+1.0L, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various cases like DERY, EY DISENO, SismoX FHE, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various cases like EY CORREGIDO, MUERTA TOTAL, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various cases like SISMOX, MUERTA TOTAL, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various cases like PPropio, SismoX FHE, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various cases like 1.2D+1.0E+0.3E+1.0L, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various cases like DERY, EX CORREGIDO, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX, MY, MZ. Contains joint reaction data for various cases like EY CORREGIDO, DERY, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX. Contains joint reaction data for various cases like SISMOX, MUERTA TOTAL, EX CORREGIDO, etc.

Table 5.8 - Joint Reactions (Part 1 of 2, continued)

Table with columns: Story, Label, Unique Name, Output Case, Case Type, Step Type, FX, FY, FZ, MX. Contains joint reaction data for various cases like PPropio, Viva, Muerta, SismoX FHE, etc.

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

Table with columns: MY, MZ, kN-m, kN-m. Contains joint reaction data for various cases like PPropio, Viva, Muerta, SismoX FHE, etc.

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

Table with columns: MY, MZ, kN-m, kN-m. Contains joint reaction data for various cases like PPropio, Viva, Muerta, SismoX FHE, etc.

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

Table with columns: MY, MZ, kN-m, kN-m. Contains joint reaction data for various cases like PPropio, Viva, Muerta, SismoX FHE, etc.

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

Table with columns: MY, MZ, kN-m, kN-m. Contains joint reaction data for various cases like PPropio, Viva, Muerta, SismoX FHE, etc.

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| -8.5206 | -0.0544 |
| 0.8508 | 0.0665 |
| -4.7285 | -0.0665 |
| -1.8417 | 0 |
| 0.0119 | 0 |
| 0.0086 | 0 |
| 0.0107 | 0 |
| -43.7707 | 0.0013 |
| -0.1032 | -0.015 |
| 35.1757 | 0.1768 |
| 2.6239 | 0.2549 |
| 0.0286 | 0 |
| 42.2109 | 0.2122 |
| -42.2109 | -0.2122 |
| 3.1749 | 0.3085 |
| -3.1749 | -0.3085 |
| 42.2481 | 0.2122 |
| -42.1736 | -0.2122 |
| 3.2121 | 0.3085 |
| -3.3377 | -0.3085 |
| 7.5377 | 0.0379 |
| -7.5377 | -0.0379 |
| 0.567 | 0.0551 |
| -0.567 | -0.0551 |
| 7.7507 | 0.0544 |
| -7.6648 | -0.0544 |
| 2.8713 | 0.0665 |
| -2.7854 | -0.0665 |
| 0.0372 | 0 |
| 0.6559 | 0 |
| 0.3487 | 0 |
| 0.8742 | 0 |
| -43.2412 | 0.0013 |
| 0.0714 | -0.015 |
| 34.7283 | 0.1768 |
| 2.487 | 0.2549 |
| 1.3301 | 0 |
| 41.8789 | 0.2122 |
| -41.8730 | -0.2122 |
| 3.0093 | 0.3085 |
| -3.0093 | -0.3085 |
| 43.3507 | 0.2122 |
| -39.9971 | -0.2122 |
| 4.8861 | 0.3085 |
| -1.3325 | -0.3085 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| 7.4418 | 0.0379 |
| -7.4418 | -0.0379 |
| 0.5375 | 0.0551 |
| -0.5375 | -0.0551 |
| 9.5458 | 0.0544 |
| -5.6602 | -0.0544 |
| 4.7128 | 0.0665 |
| -0.8272 | -0.0665 |
| 1.6768 | 0 |
| -1.188 | 0 |
| -0.6292 | 0 |
| -1.2235 | 0 |
| -41.0694 | 0.0013 |
| -3.8441 | -0.015 |
| 33.193 | 0.1768 |
| 5.4197 | 0.2549 |
| -2.4115 | 0 |
| 39.8316 | 0.2122 |
| -39.8316 | -0.2122 |
| 6.5579 | 0.3085 |
| -6.5579 | -0.3085 |
| 36.7909 | 0.2122 |
| -42.8723 | -0.2122 |
| 3.5172 | 0.3085 |
| -9.6986 | -0.3085 |
| 7.1128 | 0.0379 |
| -7.1128 | -0.0379 |
| 1.1712 | 0.0551 |
| -1.1712 | -0.0551 |
| 3.9412 | 0.0544 |
| -10.9872 | -0.0544 |
| -0.2179 | 0.0665 |
| -6.8281 | -0.0665 |
| -3.0407 | 0 |
| -0.3603 | 0 |
| -0.1967 | 0 |
| -0.3824 | 0 |
| -36.8979 | 0.0013 |
| -4.7255 | -0.015 |
| 29.932 | 0.1768 |
| 6.1523 | 0.2549 |
| -0.7428 | 0 |
| 35.9194 | 0.2122 |
| -35.9194 | -0.2122 |
| 7.4443 | 0.3085 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| -7.4443 | -0.3085 |
| 34.8789 | 0.2122 |
| -36.8573 | -0.2122 |
| 6.5048 | 0.3085 |
| -6.3837 | -0.3085 |
| 6.414 | 0.0379 |
| -6.414 | -0.0379 |
| 1.3295 | 0.0551 |
| -1.3295 | -0.0551 |
| 5.7249 | 0.0544 |
| -7.9009 | -0.0544 |
| 2.1658 | 0.0665 |
| -4.3417 | -0.0665 |
| 0.6006 | -0.0005 |
| 0.6006 | -0.0005 |
| 0.3166 | -0.0002 |
| 0.6157 | -0.0003 |
| -41.1800 | 2.2701 |
| 5.7317 | -0.0124 |
| 32.354 | 1.8759 |
| 5.5281 | 0.211 |
| 1.2162 | -0.0008 |
| 38.8248 | 2.251 |
| -38.8248 | -2.251 |
| 6.6891 | 0.2553 |
| -6.6891 | -0.2553 |
| 40.3577 | 2.2501 |
| -37.2919 | -2.252 |
| 8.2219 | 0.2543 |
| -5.1562 | -0.2562 |
| 6.933 | 0.402 |
| -6.933 | -0.402 |
| 1.1947 | 0.0456 |
| -1.1947 | -0.0456 |
| 9.0675 | 0.4145 |
| -5.5153 | -0.4188 |
| 5.5057 | 0.165 |
| -1.8985 | 0.1673 |
| 1.5329 | -0.001 |
| -0.0001 | 0 |
| -0.0369 | 0 |
| -0.0718 | 0 |
| -41.7214 | 0.0013 |
| 5.8992 | -0.015 |
| 32.7681 | 0.1768 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| 5.6364 | 0.2549 |
| -0.072 | 0 |
| 39.3098 | 0.2122 |
| -39.3098 | -0.2122 |
| 6.8201 | 0.3085 |
| -6.8201 | -0.3085 |
| 39.2009 | 0.2122 |
| -39.4467 | -0.2122 |
| 6.7112 | 0.3085 |
| -6.929 | -0.3085 |
| 7.0196 | 0.0379 |
| -7.0196 | -0.0379 |
| 1.2181 | 0.0551 |
| -1.2181 | -0.0551 |
| 7.2917 | 0.0544 |
| -7.5083 | -0.0544 |
| 3.2006 | 0.0665 |
| -3.4473 | -0.0665 |
| -0.1089 | 0 |
| 0.6568 | 0 |
| 0.1587 | 0 |
| 0.2658 | 0 |
| -46.3661 | 0.0013 |
| 0.6213 | -0.015 |
| 35.9834 | 0.1768 |
| -1.226 | 0.2549 |
| 0.6726 | 0 |
| 43.1801 | 0.2122 |
| -43.1801 | -0.2122 |
| 1.4835 | 0.3085 |
| -1.4835 | -0.3085 |
| 43.8964 | 0.2122 |
| -42.3709 | -0.2122 |
| 2.2927 | 0.3085 |
| -0.6743 | -0.3085 |
| 7.7107 | 0.0379 |
| -7.7107 | -0.0379 |
| 0.265 | 0.0551 |
| -0.265 | -0.0551 |
| 8.734 | 0.0544 |
| -6.8465 | -0.0544 |
| 3.5219 | 0.0665 |
| -1.6344 | -0.0665 |
| 0.6592 | 0 |
| 0.0193 | 0 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| 0.0746 | 0 |
| 0.145 | 0 |
| -44.0611 | 0.0013 |
| -0.0961 | -0.015 |
| 34.1819 | 0.1768 |
| 0.8732 | 0.2549 |
| 0.1644 | 0 |
| 41.0183 | 0.2122 |
| -41.0183 | -0.2122 |
| 1.0566 | 0.3085 |
| -1.0566 | -0.3085 |
| 41.2573 | 0.2122 |
| -40.7793 | -0.2122 |
| 1.2956 | 0.3085 |
| -0.8176 | -0.3085 |
| 7.3247 | 0.0379 |
| -7.3247 | -0.0379 |
| 0.1887 | 0.0551 |
| -0.1887 | -0.0551 |
| 7.6532 | 0.0544 |
| -7.1094 | -0.0544 |
| 2.658 | 0.0665 |
| -2.1143 | -0.0665 |
| 0.239 | 0 |
| -0.2552 | 0 |
| -0.1979 | 0 |
| -0.3848 | 0 |
| -46.3738 | 0.0013 |
| -1.3764 | -0.015 |
| 36.0099 | 0.1768 |
| 1.9181 | 0.2549 |
| -0.84 | 0 |
| 43.2083 | 0.2122 |
| -43.2083 | -0.2122 |
| 2.3209 | 0.3085 |
| -2.3209 | -0.3085 |
| 42.3704 | 0.2122 |
| -44.0461 | -0.2122 |
| 1.4831 | 0.3085 |
| -3.1588 | -0.3085 |
| 7.7158 | 0.0379 |
| -7.7158 | -0.0379 |
| 0.1445 | 0.0551 |
| -0.1445 | -0.0551 |
| 6.8742 | 0.0544 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| -8.806 | -0.0544 |
| 1.7634 | 0.0665 |
| -3.6951 | -0.0665 |
| -0.8379 | 0 |
| -0.1082 | 0 |
| 0.0156 | 0 |
| 0.0003 | 0 |
| -41.7333 | 0.0013 |
| -5.3884 | -0.015 |
| 32.7495 | 0.1768 |
| 5.4075 | 0.2549 |
| -0.0779 | 0 |
| 39.2994 | 0.2122 |
| -39.2994 | -0.2122 |
| 6.5431 | 0.3085 |
| -6.5431 | -0.3085 |
| 39.2371 | 0.2122 |
| -39.3617 | -0.2122 |
| 6.4808 | 0.3085 |
| -6.6554 | -0.3085 |
| 7.0177 | 0.0379 |
| -7.0177 | -0.0379 |
| 1.1686 | 0.0551 |
| -1.1686 | -0.0551 |
| 7.2904 | 0.0544 |
| -7.4462 | -0.0544 |
| 3.196 | 0.0665 |
| -3.3518 | -0.0665 |
| -0.0623 | 0 |
| -0.5767 | -0.0005 |
| -0.3109 | -0.0002 |
| -0.8045 | -0.0003 |
| -41.172 | 2.2701 |
| -5.9669 | -0.0124 |
| 32.3484 | 1.8759 |
| 5.807 | 0.211 |
| -1.1811 | -0.0008 |
| 38.8181 | 2.251 |
| -38.8181 | -2.251 |
| 7.1475 | 0.2553 |
| -7.1475 | -0.2553 |
| 37.3261 | 2.2501 |
| -40.3101 | -2.252 |
| 5.6555 | 0.2543 |
| -6.8395 | -0.2562 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| 6.0318 | 0.402 |
| -6.9318 | -0.402 |
| 1.2765 | 0.0456 |
| -1.2765 | -0.0456 |
| 5.5865 | 0.4145 |
| -9.043 | -0.4188 |
| 1.6278 | 0.165 |
| -5.0845 | -0.1673 |
| -1.492 | -0.001 |
| 0.9222 | 0.0001 |
| 0.4226 | 2.384E-05 |
| 0.8218 | 4.635E-05 |
| -563.5655 | -1.723E-05 |
| -0.0001 | -2.8818 |
| 429.6435 | 0.0026 |
| 0.0253 | 2.2017 |
| 1.744 | 0.0002 |
| 515.5722 | 0.0031 |
| -0.0306 | 2.6641 |
| -0.0306 | -2.6641 |
| 517.7388 | 0.0033 |
| -513.4056 | -0.003 |
| 2.1972 | 2.6643 |
| 2.136 | -2.6939 |
| 92.0665 | 0.0006 |
| -92.0665 | -0.0006 |
| 0.0055 | 0.4758 |
| -0.0055 | -0.4758 |
| 94.5835 | 0.1435 |
| -89.5527 | -0.1431 |
| 30.1498 | 0.4702 |
| -25.11 | -0.4758 |
| 2.1666 | 0.0002 |
| -0.1959 | -0.0001 |
| -0.0951 | -2.388E-05 |
| -0.1849 | -4.844E-05 |
| -546.5527 | 0.0021 |
| -0.0001 | 2.657 |
| 418.9748 | 0.2952 |
| 0.0247 | 2.5151 |
| -0.3808 | -0.0002 |
| 502.7698 | 0.3543 |
| -502.7698 | -0.3543 |
| 0.0299 | 3.0432 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| -0.0299 | -3.0432 |
| 502.2939 | 0.3541 |
| -503.2457 | -0.3545 |
| -0.446 | 3.0431 |
| -0.5057 | -3.0434 |
| 89.7803 | 0.0633 |
| -89.7803 | -0.0633 |
| 0.0053 | 0.5405 |
| -0.0053 | -0.5435 |
| 89.2299 | 0.2281 |
| -90.334 | -0.2285 |
| 26.3874 | 0.5623 |
| -27.4915 | -0.5627 |
| -0.4759 | -0.0022 |
| 0.2571 | 0.0001 |
| 0.1235 | 2.379E-05 |
| 0.2402 | 4.626E-05 |
| -549.5978 | 0.0021 |
| -0.0003 | -2.907 |
| 418.9008 | 0.2945 |
| 0.0247 | 2.6112 |
| 0.4973 | 0.0002 |
| 502.8009 | 0.3534 |
| -502.8009 | -0.3534 |
| 0.0298 | 3.1595 |
| -0.0298 | -3.1595 |
| 503.4218 | 0.3536 |
| -502.1801 | -0.3532 |
| 0.6507 | 3.1597 |
| 0.591 | -3.1593 |
| 89.7859 | 0.0631 |
| -89.7859 | -0.0631 |
| 0.0053 | 0.5643 |
| -0.0053 | -0.5643 |
| 90.5078 | 0.2326 |
| -89.0672 | -0.2322 |
| 27.8614 | 0.5634 |
| -26.2208 | -0.563 |
| 0.6208 | 0.0002 |
| -0.817 | -0.0001 |
| -0.3854 | -2.384E-05 |
| -0.7494 | -4.835E-05 |
| -563.5932 | -1.506E-05 |
| -0.0003 | 2.8622 |
| 429.6648 | 0.002 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| 0.0253 | 2.2018 |
| -1.5846 | -0.0022 |
| 515.5975 | 0.0024 |
| -515.5975 | -0.0024 |
| 0.0306 | 2.6641 |
| -0.0306 | -2.6641 |
| 513.6457 | 0.0022 |
| -511.5463 | -0.0023 |
| -1.5212 | 2.664 |
| -1.9824 | -2.6643 |
| 92.071 | 0.0004 |
| -92.071 | -0.0004 |
| 0.0055 | 0.4758 |
| -0.0055 | -0.4758 |
| 89.8076 | 0.1429 |
| -94.3377 | -0.1434 |
| 25.3617 | 0.4757 |
| -29.8918 | -0.4762 |
| -1.8518 | -0.0002 |
| 0.6012 | 0.0005 |
| 0.3168 | 0.0002 |
| 0.816 | 0.0003 |
| -41.1947 | -2.268 |
| -5.7307 | -0.0124 |
| 32.9788 | 1.8722 |
| 5.526 | 0.211 |
| 1.2173 | 0.0008 |
| 38.8546 | 2.2466 |
| -38.8546 | -2.2466 |
| 6.6885 | 0.2553 |
| -6.6865 | -0.2553 |
| 40.3887 | 2.2476 |
| -37.3206 | -2.2456 |
| 8.2206 | 0.2562 |
| -5.1524 | -0.2543 |
| 6.9383 | 0.4012 |
| -6.9383 | -0.4012 |
| 1.5942 | 0.0456 |
| -1.1942 | -0.0456 |
| 9.0741 | 0.416 |
| -5.5191 | -0.4137 |
| 5.0532 | 0.1671 |
| -1.4862 | -0.1648 |
| 1.6341 | 0.001 |
| 0.0007 | 0 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| -0.0367 | 0 |
| -0.0715 | 0 |
| -41.735 | 0.0013 |
| -5.8978 | -0.015 |
| 32.782 | 0.1768 |
| 5.6339 | 0.2549 |
| -0.0708 | 0 |
| 39.3384 | 0.2122 |
| -39.3384 | -0.2122 |
| 6.817 | 0.3085 |
| -6.817 | -0.3085 |
| 39.2311 | 0.2122 |
| -39.4458 | -0.2122 |
| 6.7097 | 0.3085 |
| -6.9243 | -0.3085 |
| 7.0247 | 0.0379 |
| -7.0247 | -0.0379 |
| 1.2175 | 0.0551 |
| -1.2175 | -0.0551 |
| 7.6665 | 0.0544 |
| -7.5114 | -0.0544 |
| 3.2035 | 0.0665 |
| -3.4464 | -0.0665 |
| -0.1073 | 0 |
| 0.407 | 0 |
| 0.1968 | 0 |
| 0.268 | 0 |
| -46.3749 | 0.0013 |
| -0.6194 | -0.015 |
| 35.9982 | 0.1768 |
| 1.2232 | 0.2549 |
| 0.673 | 0 |
| 43.1978 | 0.2122 |
| -43.1978 | -0.2122 |
| 1.4801 | 0.3085 |
| -1.4801 | -0.3085 |
| 44.0076 | 0.2122 |
| -42.3881 | -0.2122 |
| 2.2998 | 0.3085 |
| -0.6703 | -0.3085 |
| 7.7139 | 0.0379 |
| -7.7139 | -0.0379 |
| 0.2643 | 0.0551 |
| -0.2643 | -0.0551 |
| 8.7376 | 0.0544 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| -6.8488 | -0.0544 |
| 3.5229 | 0.0665 |
| -1.6342 | -0.0665 |
| 0.8098 | 0 |
| 0.0193 | 0 |
| 0.0748 | 0 |
| 0.1451 | 0 |
| 44.0883 | 0.0013 |
| 0.0961 | -0.015 |
| 34.1961 | 0.1768 |
| 0.8732 | 0.2549 |
| 0.1644 | 0 |
| 41.0394 | 0.2122 |
| -41.0394 | -0.2122 |
| 1.0565 | 0.3085 |
| -1.0565 | -0.3085 |
| 41.2744 | 0.2122 |
| -40.7963 | -0.2122 |
| 1.2955 | 0.3085 |
| -0.8175 | -0.3085 |
| 7.3277 | 0.0379 |
| -7.3277 | -0.0379 |
| 0.1887 | 0.0551 |
| -0.1887 | -0.0551 |
| 7.6562 | 0.0544 |
| -7.1125 | -0.0544 |
| 2.6589 | 0.0665 |
| -2.1151 | -0.0665 |
| 0.239 | 0 |
| -0.2555 | 0 |
| -0.198 | 0 |
| -0.3849 | 0 |
| -46.3828 | 0.0013 |
| 1.3744 | -0.015 |
| 36.022 | 0.1768 |
| 1.9182 | 0.2549 |
| -0.6404 | 0 |
| 43.2265 | 0.2122 |
| -43.2265 | -0.2122 |
| 2.3186 | 0.3085 |
| -2.3186 | -0.3085 |
| 42.3881 | 0.2122 |
| -44.0848 | -0.2122 |
| 1.4803 | 0.3085 |
| -1.157 | -0.3085 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| 7.719 | 0.0379 |
| -7.719 | -0.0379 |
| 0.4141 | 0.0551 |
| -0.4141 | -0.0551 |
| 6.8768 | 0.0544 |
| -8.8097 | -0.0544 |
| 1.7634 | 0.0665 |
| -3.8969 | -0.0665 |
| -0.8384 | 0 |
| -0.109 | 0 |
| 0.0153 | 0 |
| 0.0298 | 0 |
| -41.7462 | 0.0013 |
| 5.3696 | -0.015 |
| 32.7725 | 0.1768 |
| 5.4059 | 0.2549 |
| -0.0792 | 0 |
| 39.327 | 0.2122 |
| -39.327 | -0.2122 |
| 6.5412 | 0.3085 |
| -6.5412 | -0.3085 |
| 39.2831 | 0.2122 |
| -39.3909 | -0.2122 |
| 6.4772 | 0.3085 |
| -6.6051 | -0.3085 |
| 7.0227 | 0.0379 |
| -7.0227 | -0.0379 |
| 1.1683 | 0.0551 |
| -1.1683 | -0.0551 |
| 7.2934 | 0.0544 |
| -7.4529 | -0.0544 |
| 3.1953 | 0.0665 |
| -3.3548 | -0.0665 |
| -0.0639 | 0 |
| -0.5774 | 0.0005 |
| -0.311 | 0.0002 |
| -0.6048 | 0.0003 |
| -41.1882 | -2.268 |
| 5.9659 | -0.0124 |
| 32.3728 | 1.8722 |
| 5.906 | 0.211 |
| -1.1822 | 0.0008 |
| 38.8474 | 2.2466 |
| -38.8474 | -2.2466 |
| 7.1462 | 0.2553 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| -7.1462 | -0.2553 |
| 37.3542 | 2.2476 |
| -40.3406 | -2.2456 |
| 5.853 | 0.2562 |
| -8.6394 | -0.2543 |
| 6.937 | 0.4012 |
| -8.937 | -0.4012 |
| 1.2763 | 0.0456 |
| -1.2763 | -0.0456 |
| 5.5903 | 0.416 |
| -9.0496 | -0.4137 |
| 1.6278 | 0.1671 |
| -5.071 | -0.1648 |
| -1.8923 | 0.001 |
| 0.3762 | 0 |
| 0.2018 | 0 |
| 0.3925 | 0 |
| -38.9242 | 0.0013 |
| -4.3737 | -0.015 |
| 29.9762 | 0.1768 |
| 5.5198 | 0.2549 |
| 0.7686 | 0 |
| 35.9739 | 0.2122 |
| -35.9739 | -0.2122 |
| 6.679 | 0.3085 |
| -6.679 | -0.3085 |
| 36.9443 | 0.2122 |
| -35.0034 | -0.2122 |
| 7.6495 | 0.3085 |
| -5.7086 | -0.3085 |
| 6.4239 | 0.0379 |
| -6.4239 | -0.0379 |
| 1.1929 | 0.0551 |
| -1.1929 | -0.0551 |
| 7.906 | 0.0544 |
| -5.6576 | -0.0544 |
| 4.2442 | 0.0665 |
| -1.9929 | -0.0665 |
| 0.9705 | 0 |
| 1.2069 | 0 |
| 0.6371 | 0 |
| 1.2388 | 0 |
| -41.1079 | 0.0013 |
| -3.2495 | -0.015 |
| 33.2496 | 0.1768 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| 4.7568 | 0.2549 |
| 2.4457 | 0 |
| 39.8966 | 0.2122 |
| -39.8966 | -0.2122 |
| 5.7557 | 0.3085 |
| -5.7557 | -0.3085 |
| 42.9624 | 0.2122 |
| -36.8167 | -0.2122 |
| 8.8385 | 0.3085 |
| -2.6728 | -0.3085 |
| 7.1249 | 0.0379 |
| -7.1249 | -0.0379 |
| 1.028 | 0.0551 |
| -1.028 | -0.0551 |
| 11.0053 | 0.0544 |
| -3.8613 | -0.0544 |
| 6.7374 | 0.0665 |
| 0.4065 | -0.0665 |
| 3.0828 | 0 |
| -0.6322 | 0 |
| -0.3452 | 0 |
| -0.6713 | 0 |
| -43.2625 | 0.0013 |
| 0.3845 | -0.015 |
| 34.7704 | 0.1768 |
| 2.7519 | 0.2549 |
| -1.3035 | 0 |
| 41.7245 | 0.2122 |
| -41.7245 | -0.2122 |
| 3.3299 | 0.3085 |
| -3.3299 | -0.3085 |
| 40.9768 | 0.2122 |
| -43.3731 | -0.2122 |
| 1.6812 | 0.3085 |
| -4.9785 | -0.3085 |
| 7.4508 | 0.0379 |
| -7.4508 | -0.0379 |
| 0.5947 | 0.0551 |
| -0.5947 | -0.0551 |
| 5.7198 | 0.0544 |
| -9.5386 | -0.0544 |
| 0.9206 | 0.0665 |
| -4.7993 | -0.0665 |
| -1.8487 | 0 |
| 0.012 | 0 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| 0.0086 | 0 |
| 0.0167 | 0 |
| -43.8068 | 0.0013 |
| 0.1029 | -0.015 |
| 35.2226 | 0.1768 |
| 2.6239 | 0.2549 |
| 0.0287 | 0 |
| 42.2672 | 0.2122 |
| -42.2672 | -0.2122 |
| 3.175 | 0.3085 |
| -3.175 | -0.3085 |
| 42.3044 | 0.2122 |
| -42.2299 | -0.2122 |
| 3.2122 | 0.3085 |
| -3.1377 | -0.3085 |
| 7.5477 | 0.0379 |
| -7.5477 | -0.0379 |
| 0.567 | 0.0551 |
| -0.567 | -0.0551 |
| 7.3608 | 0.0544 |
| -7.6748 | -0.0544 |
| 2.8744 | 0.0665 |
| -2.7884 | -0.0665 |
| 0.0373 | 0 |
| 0.658 | 0 |
| 0.3494 | 0 |
| 0.6774 | 0 |
| -43.2689 | 0.0013 |
| -0.0696 | -0.015 |
| 34.7751 | 0.1768 |
| 2.4881 | 0.2549 |
| 1.3254 | 0 |
| 41.7302 | 0.2122 |
| -41.7302 | -0.2122 |
| 3.0106 | 0.3085 |
| -3.0106 | -0.3085 |
| 43.4139 | 0.2122 |
| -40.9664 | -0.2122 |
| 4.6944 | 0.3085 |
| -1.3268 | -0.3085 |
| 7.4518 | 0.0379 |
| -7.4518 | -0.0379 |
| 0.5377 | 0.0551 |
| -0.5377 | -0.0551 |
| 9.564 | 0.0544 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| -5.6233 | -0.0544 |
| 4.7241 | 0.0665 |
| -0.8224 | -0.0665 |
| 1.6838 | 0 |
| -1.1942 | 0 |
| -0.6333 | 0 |
| -1.2314 | 0 |
| 41.0965 | 0.0013 |
| 3.6306 | -0.015 |
| 33.2427 | 0.1768 |
| 5.4084 | 0.2549 |
| -2.4256 | 0 |
| 39.8913 | 0.2122 |
| -39.8913 | -0.2122 |
| 6.5441 | 0.3085 |
| -6.5441 | -0.3085 |
| 36.8324 | 0.2122 |
| -42.9502 | -0.2122 |
| 3.4852 | 0.3085 |
| -6.602 | -0.3085 |
| 7.1234 | 0.0379 |
| -7.1234 | -0.0379 |
| 1.1688 | 0.0551 |
| -1.1688 | -0.0551 |
| 3.9301 | 0.0544 |
| -11.0181 | -0.0544 |
| -0.2382 | 0.0665 |
| -6.8498 | -0.0665 |
| -3.0589 | 0 |
| -0.3637 | 0 |
| -0.1981 | 0 |
| -0.2622 | 0 |
| -36.8208 | 0.0013 |
| 4.7046 | -0.015 |
| 29.8745 | 0.1768 |
| 6.1342 | 0.2549 |
| -0.7499 | 0 |
| 35.9984 | 0.2122 |
| -35.9694 | -0.2122 |
| 7.4224 | 0.3085 |
| -7.4224 | -0.3085 |
| 35.0223 | 0.2122 |
| -36.9164 | -0.2122 |
| 6.8753 | 0.3085 |
| -8.3695 | -0.3085 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| 6.4231 | 0.0379 |
| -6.4231 | -0.0379 |
| 1.3256 | 0.0551 |
| -1.3256 | -0.0551 |
| 5.7239 | 0.0544 |
| -7.9177 | -0.0544 |
| 2.1567 | 0.0665 |
| -4.3494 | -0.0665 |
| -0.9471 | 0 |
| 1.482 | 0 |
| 0.5394 | 0 |
| 1.0488 | 0 |
| -38.2705 | 0.0013 |
| 0.2569 | -0.015 |
| 31.525 | 0.1768 |
| 3.2726 | 0.2549 |
| 2.5109 | 0 |
| 37.8301 | 0.2122 |
| -37.8301 | -0.2122 |
| 3.9598 | 0.3085 |
| -3.9598 | -0.3085 |
| 40.8903 | 0.2122 |
| -34.7798 | -0.2122 |
| 7.0101 | 0.3085 |
| -9.9096 | -0.3085 |
| 6.7554 | 0.0379 |
| -6.7554 | -0.0379 |
| 0.7072 | 0.0551 |
| -0.7072 | -0.0551 |
| 10.52 | 0.0544 |
| -3.4151 | -0.0544 |
| 6.2863 | 0.0665 |
| 0.8186 | -0.0665 |
| 3.0503 | 0 |
| -0.8567 | 0 |
| -0.2996 | 0 |
| -0.5626 | 0 |
| 44.0119 | 0.0013 |
| 0.1626 | -0.015 |
| 36.2616 | 0.1768 |
| 3.9189 | 0.2549 |
| -1.4392 | 0 |
| 43.5139 | 0.2122 |
| -43.5139 | -0.2122 |
| 4.7419 | 0.3085 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| -4.7419 | -0.3085 |
| 41.7151 | 0.2122 |
| -45.2528 | -0.2122 |
| 3.003 | 0.3085 |
| -6.4807 | -0.3085 |
| 7.7703 | 0.0379 |
| -7.7703 | -0.0379 |
| 0.3469 | 0.0551 |
| -0.3469 | -0.0551 |
| 5.9978 | 0.0544 |
| -10.0511 | -0.0544 |
| 1.1513 | 0.0665 |
| -5.2047 | -0.0665 |
| -1.3398 | 0 |
| 0.0084 | 0 |
| 0.003 | 0 |
| 0.0058 | 0 |
| -43.5751 | 0.0013 |
| 0.2224 | -0.015 |
| 35.8902 | 0.1768 |
| 3.9009 | 0.2549 |
| 0.0142 | 0 |
| 43.0682 | 0.2122 |
| -43.0682 | -0.2122 |
| 4.7201 | 0.3085 |
| -4.7201 | -0.3085 |
| 43.0853 | 0.2122 |
| -43.0511 | -0.2122 |
| 4.7372 | 0.3085 |
| -7.0299 | -0.3085 |
| 7.6907 | 0.0379 |
| -7.6907 | -0.0379 |
| 0.843 | 0.0551 |
| -0.843 | -0.0551 |
| 7.9636 | 0.0544 |
| -7.9237 | -0.0544 |
| 3.1702 | 0.0665 |
| -3.1393 | -0.0665 |
| 0.0171 | 0 |
| 0.8755 | 0 |
| 0.3052 | 0 |
| 0.5934 | 0 |
| -44.012 | 0.0013 |
| 0.3085 | -0.015 |
| 36.2617 | 0.1768 |

Table 5.8 - Joint Reactions (Part 2 of 2, continued)

| MY kN-m | MZ kN-m |
|------------|------------|
| 4.0058 | 0.2549 |
| 1.4689 | 0 |
| 43.5141 | 0.2122 |
| -43.5141 | -0.2122 |
| 4.847 | 0.3085 |
| -4.847 | -0.3085 |
| 45.2882 | 0.2122 |
| -41.7393 | -0.2122 |
| 6.6212 | 0.3085 |
| -3.0729 | -0.3085 |
| 7.7704 | 0.0379 |
| -7.7704 | -0.0379 |
| 0.8657 | 0.0551 |
| -0.8657 | -0.0551 |
| 10.098 | 0.0544 |
| -9.9021 | -0.0544 |
| 5.2647 | 0.0665 |
| -1.1289 | -0.0665 |
| 1.7741 | 0 |
| -1.4466 | 0 |
| -0.5343 | 0 |
| -1.0388 | 0 |
| -38.2694 | 0.0013 |
| 0.6807 | -0.015 |
| 31.5243 | 0.1768 |
| 3.778 | 0.2549 |
| -2.4852 | 0 |
| 37.8291 | 0.2122 |
| -37.8291 | -0.2122 |
| 4.5714 | 0.3085 |
| -4.5714 | -0.3085 |
| 34.8096 | 0.2122 |
| -40.8488 | -0.2122 |
| 1.5519 | 0.3085 |
| -7.5908 | -0.3085 |
| 6.7552 | 0.0379 |
| -6.7552 | -0.0379 |
| 0.8164 | 0.0551 |
| -0.8164 | -0.0551 |
| 3.4836 | 0.0544 |
| -10.5168 | -0.0544 |
| -0.6735 | 0.0665 |
| -6.3595 | -0.0665 |
| -3.0196 | 0 |

5.4 Modal Results

Table 5.9 - Modal Periods And Frequencies

| Case | Mode | Period sec | Frequency cyc/sec | CircFreq rad/sec | Eigenvalue rad ² /sec ² |
|----------|------|---------------|----------------------|---------------------|--|
| Modal 1 | 1 | 0.425 | 2.355 | 14.7986 | 218.9988 |
| Modal 2 | 2 | 0.369 | 2.714 | 17.0503 | 290.711 |
| Modal 3 | 3 | 0.356 | 2.807 | 17.6247 | 310.9814 |
| Modal 4 | 4 | 0.107 | 9.365 | 56.8421 | 3462.3893 |
| Modal 5 | 5 | 0.093 | 10.714 | 67.3194 | 4531.9034 |
| Modal 6 | 6 | 0.089 | 11.257 | 70.7294 | 5002.6416 |
| Modal 7 | 7 | 0.049 | 20.216 | 127.024 | 16135.0855 |
| Modal 8 | 8 | 0.045 | 22.004 | 138.2554 | 19114.5951 |
| Modal 9 | 9 | 0.041 | 24.435 | 153.0389 | 22571.1032 |
| Modal 10 | 10 | 0.032 | 31.027 | 194.9456 | 38003.7685 |
| Modal 11 | 11 | 0.031 | 32.129 | 201.8702 | 40751.5612 |
| Modal 12 | 12 | 0.027 | 37.576 | 236.0983 | 55742.4269 |

Table 5.10 - Modal Participating Mass Ratios (Part 1 of 2)

| Case | Mode | Period sec | UX | UY | UZ | SumUX | SumUY | SumUZ | RX | RY | RZ |
|----------|------|---------------|-----------|-----------|----|--------|--------|-------|-----------|-----------|-----------|
| Modal 1 | 1 | 0.425 | 0 | 0.7353 | 0 | 0 | 0.7353 | 0 | 0.3014 | 0 | 0.0001 |
| Modal 2 | 2 | 0.369 | 0.7364 | 0 | 0 | 0.7364 | 0.7353 | 0 | 0 | 0.3002 | 3.226E-05 |
| Modal 3 | 3 | 0.356 | 3.222E-05 | 0.0001 | 0 | 0.7364 | 0.7354 | 0 | 4.619E-05 | 1.316E-05 | 0.7331 |
| Modal 4 | 4 | 0.107 | 0 | 0.1789 | 0 | 0.7364 | 0.9143 | 0 | 0.4543 | 0 | 4.038E-05 |
| Modal 5 | 5 | 0.093 | 0.1905 | 0 | 0 | 0.9269 | 0.9143 | 0 | 0 | 0.4811 | 5.039E-06 |
| Modal 6 | 6 | 0.089 | 5.452E-06 | 4.237E-05 | 0 | 0.9269 | 0.9143 | 0 | 0.0001 | 1.38E-05 | 0.18 |
| Modal 7 | 7 | 0.049 | 0 | 0.0602 | 0 | 0.9269 | 0.9745 | 0 | 0.1602 | 0 | 1.542E-05 |
| Modal 8 | 8 | 0.045 | 0.0529 | 0 | 0 | 0.9798 | 0.9745 | 0 | 0 | 0.1488 | 0 |
| Modal 9 | 9 | 0.041 | 0 | 1.562E-05 | 0 | 0.9798 | 0.9746 | 0 | 4.138E-05 | 9.33E-07 | 0.061 |
| Modal 10 | 10 | 0.032 | 0 | 0.0209 | 0 | 0.9798 | 0.9954 | 0 | 0.0689 | 0 | 5.46E-06 |
| Modal 11 | 11 | 0.031 | 0.0167 | 0 | 0 | 0.9965 | 0.9954 | 0 | 0 | 0.0577 | 0 |
| Modal 12 | 12 | 0.027 | 0 | 5.561E-06 | 0 | 0.9965 | 0.9955 | 0 | 1.823E-05 | 0 | 0.0211 |

Table 5.10 - Modal Participating Mass Ratios (Part 2 of 2)

| SumRX | SumRY | SumRZ |
|--------|--------|--------|
| 0.3014 | 0 | 0.0001 |
| 0.3014 | 0.3002 | 0.0002 |
| 0.3014 | 0.3002 | 0.7332 |
| 0.7557 | 0.3002 | 0.7332 |
| 0.7557 | 0.7813 | 0.7333 |
| 0.7558 | 0.7813 | 0.9133 |
| 0.9159 | 0.7813 | 0.9133 |
| 0.9159 | 0.9301 | 0.9133 |
| 0.916 | 0.9301 | 0.9743 |
| 0.9849 | 0.9301 | 0.9743 |
| 0.9849 | 0.9878 | 0.9743 |
| 0.9849 | 0.9878 | 0.9954 |

Table 5.11 - Modal Load Participation Ratios

| Case | ItemType | Item | Static % | Dynamic % |
|-------|--------------|------|-------------|--------------|
| Modal | Acceleration | UX | 100 | 99.65 |
| Modal | Acceleration | UY | 100 | 99.55 |
| Modal | Acceleration | UZ | 0 | 0 |

Table 5.12 - Modal Direction Factors

| Case | Mode | Period sec | UX | UY | UZ | RZ |
|----------|------|---------------|----|----|----|----|
| Modal 1 | 1 | 0.425 | 0 | 1 | 0 | 0 |
| Modal 2 | 2 | 0.369 | 1 | 0 | 0 | 0 |
| Modal 3 | 3 | 0.356 | 0 | 0 | 0 | 1 |
| Modal 4 | 4 | 0.107 | 0 | 1 | 0 | 0 |
| Modal 5 | 5 | 0.093 | 1 | 0 | 0 | 0 |
| Modal 6 | 6 | 0.089 | 0 | 0 | 0 | 1 |
| Modal 7 | 7 | 0.049 | 0 | 1 | 0 | 0 |
| Modal 8 | 8 | 0.045 | 1 | 0 | 0 | 0 |
| Modal 9 | 9 | 0.041 | 0 | 0 | 0 | 1 |
| Modal 10 | 10 | 0.032 | 0 | 1 | 0 | 0 |
| Modal 11 | 11 | 0.031 | 1 | 0 | 0 | 0 |
| Modal 12 | 12 | 0.027 | 0 | 0 | 0 | 1 |

ANEXO No 3
MEMORIAS DE CÁLCULO EDIFICIO SISTEMA EN MUROS EN
MAMPOSTERÍA



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Prepared by

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1. Model geometry

This section provides model geometry information, including items such as joint coordinates, joint restraints, and element connectivity.

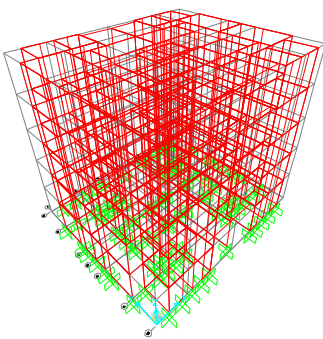


Figure 1: Finite element model

1.1. Joint coordinates

Table 1: Joint Coordinates

Table with 6 columns: Joint, Coordsys, CoordType, Globalx, Globaly, Globalz. Contains joint coordinate data for joints 508 to 564.

1. Model geometry

Table with 6 columns: Joint, Coordsys, CoordType, Globalx, Globaly, Globalz. Contains joint coordinate data for joints 565 to 619.

1. Model geometry

Table with 6 columns: Joint, Coordsys, CoordType, Globalx, Globaly, Globalz. Contains joint coordinate data for joints 620 to 674.

Table with 6 columns: Joint, Coordsys, CoordType, Globalx, Globaly, Globalz. Contains joint coordinate data for joints 675 to 717.

Table with 6 columns: Joint, Coordsys, CoordType, Globalx, Globaly, Globalz. Contains joint coordinate data for joints 718 to 1176.

Table with 6 columns: Joint, Coordsys, CoordType, Globalx, Globaly, Globalz. Contains joint coordinate data for joints 1177 to 1230.

Table 1: Joint Coordinates. Columns: Joint, CoordSys, CoorType, GlobalX, GlobalY, GlobalZ. Rows 1221-1284.

Table 1: Joint Coordinates. Columns: Joint, CoordSys, CoorType, GlobalX, GlobalY, GlobalZ. Rows 1285-1348.

Table 1: Joint Coordinates. Columns: Joint, CoordSys, CoorType, GlobalX, GlobalY, GlobalZ. Rows 1349-1412.

Table 1: Joint Coordinates. Columns: Joint, CoordSys, CoorType, GlobalX, GlobalY, GlobalZ. Rows 1413-1476.

Table 1: Joint Coordinates. Columns: Joint, CoordSys, CoorType, GlobalX, GlobalY, GlobalZ. Rows 1477-1540.

Table 1: Joint Coordinates. Columns: Joint, CoordSys, CoorType, GlobalX, GlobalY, GlobalZ. Rows 1541-1604.

Table 2: Joint Restraint Assignments. Columns: Joint, U1, U2, U3, R1, R2, R3. Rows 1505-1568.

2. Joint restraints

Table 2: Joint Restraint Assignments

Table 2: Joint Restraint Assignments. Columns: Joint, U1, U2, U3, R1, R2, R3. Rows 506-509.

Table 2: Joint Restraint Assignments. Columns: Joint, U1, U2, U3, R1, R2, R3. Rows 1569-1632.

Table 2: Joint Restraint Assignments. Columns: Joint, U1, U2, U3, R1, R2, R3. Rows 1633-1696.

3. Element connectivity

Table 3: Connectivity - Area

Table 3: Connectivity - Area. Columns: Area, Joint1, Joint2, Joint3, Joint4. Rows 67-71.

Table 4: Area Section Assignments. Columns: Area, Section, M/Prop. Rows 104-487. Includes categories like MAMPOSTERIA REFORZADA, PLACA MACIZA, and muroconcreto21.

Table 4: Area Section Assignments. Columns: Area, Section, M/Prop. Rows 488-568. Includes categories like PLACA MACIZA, MAMPOSTERIA REFORZADA, and muroconcreto21.

Table 4: Area Section Assignments. Columns: Area, Section, M/Prop. Rows 524-598. Includes categories like MAMPOSTERIA REFORZADA, PLACA MACIZA, and muroconcreto21.

Table 4: Area Section Assignments. Columns: Area, Section, M/Prop. Rows 559-599. Includes categories like PLACA MACIZA, MAMPOSTERIA REFORZADA, and muroconcreto21.

Table 4: Area Section Assignments. Columns: Area, Section, M/Prop. Rows 600-630. Includes categories like MAMPOSTERIA REFORZADA, PLACA MACIZA, and muroconcreto21.

Table 4: Area Section Assignments. Columns: Area, Section, M/Prop. Rows 631-674. Includes categories like MAMPOSTERIA REFORZADA, PLACA MACIZA, and muroconcreto21.

Table 4: Area Section Assignments. Columns: Area, Section, M/Prop. Rows 675-705. Includes categories like MAMPOSTERIA REFORZADA, PLACA MACIZA, and muroconcreto21.

Table 4: Area Section Assignments. Columns: Area, Section, M/Prop. Rows 706-749. Includes categories like MAMPOSTERIA REFORZADA, PLACA MACIZA, and muroconcreto21.

Table 4: Area Section Assignments. Columns: Area, Section, M/Prop. Rows 750-781. Includes categories like MAMPOSTERIA REFORZADA, PLACA MACIZA, and muroconcreto21.

Table 4: Area Section Assignments. Table with columns: Area, Section, MIP/Prop. Lists assignments for various areas like MAMPOSTERIA REFORZADA, PLACA MACIZA, etc.

Table 4: Area Section Assignments. Table with columns: Area, Section, MIP/Prop. Lists assignments for various areas like PLACA MACIZA, MAMPOSTERIA REFORZADA, etc.

2. Material properties

This section provides material property information for materials used in the model.

Table 5: Material Properties 02 - Basic Mechanical Properties

Table 5: Material Properties 02 - Basic Mechanical Properties. Table with columns: Material, UnitWeight, Modulus, E1, E2, U12, A1, A1C. Lists properties for materials like 21MPa, A415G70, A615G60, A902F50, and Mamposteria.

Table 6: Material Properties 03a - Steel Data

Table 6: Material Properties 03a - Steel Data. Table with columns: Material, Fy, Fu, Fy/Mod, Fu/Mod, Cps/Mod, Ft. Lists properties for material A992F50.

Table 7: Material Properties 03b - Concrete Data. Table with columns: Material, Fc, Fc/Mod, Fc/Mod, Ft, Ft/Mod, Cps/Mod, Ft. Lists properties for material 21MPa.

Table 8: Material Properties 03c - Rebar Data

Table 8: Material Properties 03c - Rebar Data. Table with columns: Material, Fy, Fu, Fy/Mod, Fu/Mod, Cps/Mod, Ft. Lists properties for material A615G60.

Table 9: Material Properties 03f - Tendon Data

Table 9: Material Properties 03f - Tendon Data. Table with columns: Material, Fy, Fu, Fy/Mod, Fu/Mod, Cps/Mod, Ft. Lists properties for material A415G70.

3. Section properties

This section provides section property information for objects used in the model.

3.1. Frames

Table 10: Frame Section Properties 01 - General, Part 1 of 5

Table 10: Frame Section Properties 01 - General, Part 1 of 5. Table with columns: SectionName, Material, Shape, I3, I2, FilterRadius, If, Iw. Lists properties for section W18X35.

Table 10: Frame Section Properties 01 - General, Part 2 of 5

Table 10: Frame Section Properties 01 - General, Part 2 of 5. Table with columns: SectionName, I3, I2, Iw. Lists properties for section W18X35.

Table 10: Frame Section Properties 01 - General, Part 3 of 5

Table 10: Frame Section Properties 01 - General, Part 3 of 5. Table with columns: SectionName, Area, TopXCent, S3, S2, S3, AS2, AS3. Lists properties for section W18X35.

Table 10: Frame Section Properties 01 - General, Part 4 of 5

Table 10: Frame Section Properties 01 - General, Part 4 of 5. Table with columns: SectionName, S33, S32, S33, Z33, R33, R22. Lists properties for section W18X35.

Table 10: Frame Section Properties 01 - General, Part 5 of 5

Table 10: Frame Section Properties 01 - General, Part 5 of 5. Table with columns: SectionName, AMod, A3Mod, A3Mod, JMod, I3Mod, I2Mod, WMod. Lists properties for section W18X35.

3.2. Areas

Table 11: Area Section Properties, Part 1 of 3

Table 11: Area Section Properties, Part 1 of 3. Table with columns: Section, Material, AreaType, Type, DistIDOF, Thickness, BendThick, F11Mod. Lists properties for various sections.

Table 11: Area Section Properties, Part 2 of 3

Table 11: Area Section Properties, Part 2 of 3. Table with columns: Section, F22Mod, F23Mod, W11Mod, W22Mod, W123Mod, V133Mod, V233Mod. Lists properties for various sections.

Table 11: Area Section Properties, Part 3 of 3

Table 11: Area Section Properties, Part 3 of 3. Table with columns: Section, Area, WMod. Lists properties for various sections.

Table 11: Area Section Properties, Part 3 of 3

Table 11: Area Section Properties, Part 3 of 3. Table with columns: Section, Area, WMod. Lists properties for section PLACA MACIZA.

3.3. Solids

Table 12: Solid Property Definitions

Table 12: Solid Property Definitions. Table with columns: SolidProp, Material, MatAngleA, MatAngleB, MatAngleC. Lists properties for solid Sdct1.

4. Load patterns

This section provides loading information as applied to the model.

4.1. Definitions

Table 13: Load Pattern Definitions

Table 13: Load Pattern Definitions. Table with columns: LoadPat, DesignType, SelfWt/Mod, AutoLoad. Lists properties for load patterns DO, DL, LL, LR.

5. Load cases

This section provides load case information.

5.1. Definitions

Table 14: Load Case Definitions, Part 1 of 2

Table 14: Load Case Definitions, Part 1 of 2. Table with columns: Case, Type, Init/Cond, Mod/Case, Base/Case, Mass/Source, Des/Act/Opt. Lists properties for load cases DO, MDAL, DL, LL.

Table 14: Load Case Definitions, Part 2 of 2

Table 14: Load Case Definitions, Part 2 of 2. Table with columns: Case, Design/Act. Lists properties for load cases MDAL, DL, LL, LR, SISMO X, SISMO Y.

5.2. Static case load assignments

Table 15: Case - Static 1 - Load Assignments

Table 15: Case - Static 1 - Load Assignments. Table with columns: Case, LoadType, LoadName, LoadSP. Lists assignments for load cases DO, DL, LL, LR.

5.3. Response spectrum case load assignments

Table 16: Case - Response Spectrum 1 - General, Part 1 of 2

Table 16: Case - Response Spectrum 1 - General, Part 1 of 2. Table with columns: Case, Mod/Combo, GM/C1, GM/C2, Pw/Rigid, St/Combo, MotionType, DampingType. Lists assignments for cases SISMO X, SISMO Y.

Table 16: Case - Response Spectrum 1 - General, Part 2 of 2

Table 16: Case - Response Spectrum 1 - General, Part 2 of 2. Table with columns: Case, Const/Damp. Lists assignments for cases SISMO X, SISMO Y.

Table 17: Case - Response Spectrum 2 - Load Assignments

Table 17: Case - Response Spectrum 2 - Load Assignments. Table with columns: Case, LoadType, LoadName, CoordSys, Function, Angle, Trans/ACCF. Lists assignments for cases SISMO X, SISMO Y.

Table 18: Function - Response Spectrum - Colombia NSR-10, Part 1 of 2

Table 18: Function - Response Spectrum - Colombia NSR-10, Part 1 of 2. Table with columns: Name, Period, Accel, Func/Damp, Aa, Av, Aa, Ad. Lists properties for various function cases.

Table 18: Function - Response Spectrum - Colombia NSR-10, Part 2 of 2

Table 18: Function - Response Spectrum - Colombia NSR-10, Part 2 of 2. Table with columns: Name, Period, Group/Case, Fa, Fv. Lists properties for various function cases.

6. Load combinations

This section provides load combination information.

Table 19: Combination Definitions

Table 19: Combination Definitions. Table with columns: ComboName, ComboType, CaseName, ScaleFactor. Lists properties for various combination cases.

Table 19: Combination Definitions

Table 19: Combination Definitions. Table with columns: ComboName, ComboType, CaseName, ScaleFactor. Lists properties for various combination cases.

7. Structure results

This section provides structure results, including items such as structural periods and base reactions.

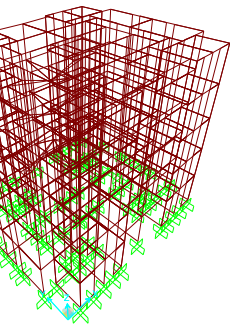


Figure 2: Deformed shape

7.1. Mass summary

Table 20: Assembled Joint Masses, Part 1 of 2

Table with 10 columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Lists mass data for joints 506 to 514.

Table with 10 columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Lists mass data for joints 626 to 691.

Table with 10 columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Lists mass data for joints 692 to 1192.

Table with 10 columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Lists mass data for joints 1193 to 1236.

Table with 10 columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Lists mass data for joints 1237 to 1290.

Table with 10 columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Lists mass data for joints 1291 to 1344.

Table with 10 columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Lists mass data for joints 1345 to 1398.

Table 20: Assembled Joint Masses, Part 1 of 2. Columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Rows 1399-1462.

Table 20: Assembled Joint Masses, Part 1 of 2. Columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Rows 1463-1506.

Table 20: Assembled Joint Masses, Part 1 of 2. Columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Rows 1507-1560.

Table 20: Assembled Joint Masses, Part 2 of 2. Columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Rows 1561-1642.

Table 20: Assembled Joint Masses, Part 2 of 2. Columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Rows 1643-1724.

Table 20: Assembled Joint Masses, Part 2 of 2. Columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Rows 1725-1806.

Table 20: Assembled Joint Masses, Part 2 of 2. Columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Rows 1807-1888.

Table 20: Assembled Joint Masses, Part 2 of 2. Columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Rows 1889-1970.

Table 20: Assembled Joint Masses, Part 2 of 2. Columns: Joint, MassSource, U1, U2, U3, R1, R2, R3, Center. Rows 1971-2052.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 513-519.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 519-525.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 525-532.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 532-539.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 539-546.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 544-550.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 550-557.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 559-566.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 565-571.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 571-577.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 577-584.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 584-590.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 590-596.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 596-602.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 602-608.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 609-615.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 615-621.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 621-627.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 628-633.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 635-641.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 642-648.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 647-653.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 655-661.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 662-668.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 669-675.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 677-683.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 684-690.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows: 687-699.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows: 699-704.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows: 704-711.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows: 1149-1159.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows: 1159-1169.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows: 1169-1179.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows: 1179-1189.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows: 1189-1199.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows: 1199-1209.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1190-1196.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1196-1202.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1202-1209.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1209-1216.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1216-1223.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1223-1230.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1230-1237.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1237-1244.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1244-1251.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1246-1255.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1253-1262.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1259-1268.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1265-1274.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1271-1280.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1277-1286.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1284-1293.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1290-1299.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1296-1305.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1302-1309.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1310-1317.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1318-1325.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1326-1333.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1334-1341.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1342-1349.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1350-1357.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1358-1365.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1366-1373.

Table 23. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1359-1402.

Table 23. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1365-1408.

Table 23. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1371-1414.

Table 23. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1377-1420.

Table 23. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1384-1427.

Table 23. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1391-1434.

Table 23. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1396-1439.

Table 23. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1402-1445.

Table 23. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1409-1452.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1415-1421.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1421-1427.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1427-1433.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1434-1441.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1441-1447.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1447-1454.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1454-1461.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1461-1467.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1467-1474.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1471-1477.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1477-1487.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1484-1495.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1490-1499.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1496-1501.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1502-1509.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1509-1519.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1510-1520.

Table 23. Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows 1521-1527.

Table 21. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows include joints 1527 to 1534 with various displacement and rotation values.

Table 21. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows include joints 1534 to 1547 with various displacement and rotation values.

Table 21. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows include joints 1547 to 1564 with various displacement and rotation values.

Table 21. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows include joints 1546 to 1555 with various displacement and rotation values.

Table 21. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows include joints 1555 to 1564 with various displacement and rotation values.

Table 21. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows include joints 1564 to 1573 with various displacement and rotation values.

Table 21. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows include joints 1555 to 1564 with various displacement and rotation values.

Table 21. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows include joints 1573 to 1582 with various displacement and rotation values.

Table 21. Joint Displacements. Table with 13 columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows include joints 1582 to 1591 with various displacement and rotation values.

Table 23: Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows: 1584 to 1598.

Table 23: Joint Displacements. Columns: Joint, OutputCase, U1, U2, U3, R1, R2, R3. Rows: 1599 to 1613.

Table 24: Joint Reactions. Columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows: 507 to 513.

Table 24: Joint Reactions

Table 24: Joint Reactions. Columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows: 506 to 513.

Table 24: Joint Reactions. Columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows: 513 to 520.

Table 24: Joint Reactions. Columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows: 520 to 527.

Table 24: Joint Reactions. Columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows: 527 to 533.

Table 24: Joint Reactions. Columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows: 533 to 540.

Table 24: Joint Reactions. Columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows: 540 to 546.

Table 24: Joint Reactions. Columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows: 546 to 553.

Table 24: Joint Reactions. Table with columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows list various joints (551-559) and their reaction values for different cases.

Table 24: Joint Reactions. Table with columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows list various joints (559-601) and their reaction values for different cases.

Table 24: Joint Reactions. Table with columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows list various joints (565-601) and their reaction values for different cases.

Table 24: Joint Reactions. Table with columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows list various joints (572-599) and their reaction values for different cases.

Table 24: Joint Reactions. Table with columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows list various joints (578-588) and their reaction values for different cases.

Table 24: Joint Reactions. Table with columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows list various joints (584-599) and their reaction values for different cases.

Table 24: Joint Reactions. Table with columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows list various joints (590-599) and their reaction values for different cases.

Table 24: Joint Reactions. Table with columns: Joint, OutputCase, F1, F2, F3, M1, M2, M3. Rows list various joints (597-601) and their reaction values for different cases.

Table 25: Element Forces - Area Shells. Table with columns: Area, AreaElem, Joint, OutputCase, F1, F2, F3. Rows list various area elements (67-68) and their force values for different cases.

9. Area results

This section provides area results, including items such as forces and stresses.

Table 25: Element Forces - Area Shells, Part 1 of 3

Table 25: Element Forces - Area Shells, Part 1 of 3. Table with columns: Area, AreaElem, Joint, OutputCase, F1, F2, F3. Rows list various area elements (67-68) and their force values for different cases.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows 68-69.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows 69-71.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows 71-72.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows 72-73.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows 74-75.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows 75-76.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows 77-78.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows 78-79.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows 79-80.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows 82-93 showing structural analysis results for various elements and joints.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows 83-93 showing structural analysis results for various elements and joints.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows 85-93 showing structural analysis results for various elements and joints.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows 86-93 showing structural analysis results for various elements and joints.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows 88-93 showing structural analysis results for various elements and joints.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows 89-93 showing structural analysis results for various elements and joints.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows 91-93 showing structural analysis results for various elements and joints.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows 93-94 showing structural analysis results for various elements and joints.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows 94-97 showing structural analysis results for various elements and joints.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 103, 104, 105, 106, 107, 108, 109, 110, 111, 112.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 104, 105, 106, 107, 108, 109, 110, 111, 112.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 106, 107, 108, 109, 110, 111, 112.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 108, 109, 110, 111, 112.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 109, 110, 111, 112.

Table 25: Element Forces - Area Shefts. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows list various elements and their force components.

Table 25: Element Forces - Area Shefts. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows list various elements and their force components.

Table 25: Element Forces - Area Shefts. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows list various elements and their force components.

Table 25: Element Forces - Area Shefts. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows list various elements and their force components.

Table 25: Element Forces - Area Shefts. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows list various elements and their force components.

Table 25: Element Forces - Area Shefts. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows list various elements and their force components.

Table 25: Element Forces - Area Shefts. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows list various elements and their force components.

Table 25: Element Forces - Area Shefts. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows list various elements and their force components.

Table 25: Element Forces - Area Shefts. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows list various elements and their force components.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 498-500 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 499-501 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 501-503 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 503-504 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 504-506 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 506-507 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 507-508 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 509-510 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 510-512 with various force values.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Contains data for various elements and joints, including values for F11, F22, and F12.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Contains data for various elements and joints, including values for F11, F22, and F12.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Contains data for various elements and joints, including values for F11, F22, and F12.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Contains data for various elements and joints, including values for F11, F22, and F12.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Contains data for various elements and joints, including values for F11, F22, and F12.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Contains data for various elements and joints, including values for F11, F22, and F12.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Contains data for various elements and joints, including values for F11, F22, and F12.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Contains data for various elements and joints, including values for F11, F22, and F12.

Table with 10 columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Contains data for various elements and joints, including values for F11, F22, and F12.

Table with columns: Area, AreaElem, Joint, Element, Area, Area Shells, Part 1 of 3, F11, F22, F12. Rows include data for areas 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555.

Table with columns: Area, AreaElem, Joint, Element, Area, Area Shells, Part 1 of 3, F11, F22, F12. Rows include data for areas 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555.

Table with columns: Area, AreaElem, Joint, Element, Area, Area Shells, Part 1 of 3, F11, F22, F12. Rows include data for areas 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555.

Table with columns: Area, AreaElem, Joint, Element, Area, Area Shells, Part 1 of 3, F11, F22, F12. Rows include data for areas 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555.

Table with columns: Area, AreaElem, Joint, Element, Area, Area Shells, Part 1 of 3, F11, F22, F12. Rows include data for areas 546, 547, 548, 549, 550, 551, 552, 553, 554, 555.

Table with columns: Area, AreaElem, Joint, Element, Area, Area Shells, Part 1 of 3, F11, F22, F12. Rows include data for areas 548, 549, 550, 551, 552, 553, 554, 555.

Table with columns: Area, AreaElem, Joint, Element, Area, Area Shells, Part 1 of 3, F11, F22, F12. Rows include data for areas 549, 550, 551, 552, 553, 554, 555.

Table with columns: Area, AreaElem, Joint, Element, Area, Area Shells, Part 1 of 3, F11, F22, F12. Rows include data for areas 551, 552, 553, 554, 555.

Table with columns: Area, AreaElem, Joint, Element, Area, Area Shells, Part 1 of 3, F11, F22, F12. Rows include data for areas 553, 554, 555.

Table with 10 columns: Area, AreaElem, Element, Joint, OutputCase, F11, F22, F12. Contains data for Element Forces - Area Shefts, Part 1 of 3.

Table with 10 columns: Area, AreaElem, Element, Joint, OutputCase, F11, F22, F12. Contains data for Element Forces - Area Shefts, Part 1 of 3.

Table with 10 columns: Area, AreaElem, Element, Joint, OutputCase, F11, F22, F12. Contains data for Element Forces - Area Shefts, Part 1 of 3.

Table with 10 columns: Area, AreaElem, Element, Joint, OutputCase, F11, F22, F12. Contains data for Element Forces - Area Shefts, Part 1 of 3.

Table with 10 columns: Area, AreaElem, Element, Joint, OutputCase, F11, F22, F12. Contains data for Element Forces - Area Shefts, Part 1 of 3.

Table with 10 columns: Area, AreaElem, Element, Joint, OutputCase, F11, F22, F12. Contains data for Element Forces - Area Shefts, Part 1 of 3.

Table with 10 columns: Area, AreaElem, Element, Joint, OutputCase, F11, F22, F12. Contains data for Element Forces - Area Shefts, Part 1 of 3.

Table with 10 columns: Area, AreaElem, Element, Joint, OutputCase, F11, F22, F12. Contains data for Element Forces - Area Shefts, Part 1 of 3.

Table with 10 columns: Area, AreaElem, Element, Joint, OutputCase, F11, F22, F12. Contains data for Element Forces - Area Shefts, Part 1 of 3.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 568-669.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 570-671.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 571-672.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 573-674.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 574-675.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 576-676.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 578-679.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 579-680.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 581-681.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 582-604.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 584-604.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 585-604.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 587-604.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 589-604.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 590-604.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 592-993.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 593-993.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 595-993.

Table with 11 columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Contains data for various elements and joints, including torsion and bending moments.

Table with 11 columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Contains data for various elements and joints, including torsion and bending moments.

Table with 11 columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Contains data for various elements and joints, including torsion and bending moments.

Table with 11 columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Contains data for various elements and joints, including torsion and bending moments.

Table with 11 columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Contains data for various elements and joints, including torsion and bending moments.

Table with 11 columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Contains data for various elements and joints, including torsion and bending moments.

Table with 11 columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Contains data for various elements and joints, including torsion and bending moments.

Table with 11 columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Contains data for various elements and joints, including torsion and bending moments.

Table with 11 columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Contains data for various elements and joints, including torsion and bending moments.

Table with 12 columns: Area, AreaElem, Joint, OutputCase, F11 KNm, F22 KNm, F12 KNm. Contains data for elements 610-612 across various joints and output cases.

Table with 12 columns: Area, AreaElem, Joint, OutputCase, F11 KNm, F22 KNm, F12 KNm. Contains data for elements 612-614 across various joints and output cases.

Table with 12 columns: Area, AreaElem, Joint, OutputCase, F11 KNm, F22 KNm, F12 KNm. Contains data for elements 614-615 across various joints and output cases.

Table with 12 columns: Area, AreaElem, Joint, OutputCase, F11 KNm, F22 KNm, F12 KNm. Contains data for elements 615-617 across various joints and output cases.

Table with 12 columns: Area, AreaElem, Joint, OutputCase, F11 KNm, F22 KNm, F12 KNm. Contains data for elements 617-618 across various joints and output cases.

Table with 12 columns: Area, AreaElem, Joint, OutputCase, F11 KNm, F22 KNm, F12 KNm. Contains data for elements 618-620 across various joints and output cases.

Table with 12 columns: Area, AreaElem, Joint, OutputCase, F11 KNm, F22 KNm, F12 KNm. Contains data for elements 620-621 across various joints and output cases.

Table with 12 columns: Area, AreaElem, Joint, OutputCase, F11 KNm, F22 KNm, F12 KNm. Contains data for elements 621-623 across various joints and output cases.

Table with 12 columns: Area, AreaElem, Joint, OutputCase, F11 KNm, F22 KNm, F12 KNm. Contains data for elements 623-624 across various joints and output cases.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for elements 624 through 626.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for elements 626 through 628.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for elements 628 through 629.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for elements 629 through 631.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for elements 631 through 633.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for elements 633 through 634.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for elements 634 through 636.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for elements 636 through 638.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for elements 638 through 639.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 630-640.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 640-642.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 642-643.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 643-644.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 645-646.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 646-647.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 648-649.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 649-650.

Table 25: Element Forces - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, F11, F22, F12. Rows: 650-651.

Table 25: Element Forces - Area Sheils Part 1 of 3. Columns: Area, AreaElem, Elem, Joint, OutputCase, F11, F22, F12. Rows include elements 653-663 with various force values.

Table 25: Element Forces - Area Sheils Part 1 of 3. Columns: Area, AreaElem, Elem, Joint, OutputCase, F11, F22, F12. Rows include elements 654-665 with various force values.

Table 25: Element Forces - Area Sheils Part 1 of 3. Columns: Area, AreaElem, Elem, Joint, OutputCase, F11, F22, F12. Rows include elements 656-666 with various force values.

Table 25: Element Forces - Area Sheils Part 1 of 3. Columns: Area, AreaElem, Elem, Joint, OutputCase, F11, F22, F12. Rows include elements 657-668 with various force values.

Table 25: Element Forces - Area Sheils Part 1 of 3. Columns: Area, AreaElem, Elem, Joint, OutputCase, F11, F22, F12. Rows include elements 659-669 with various force values.

Table 25: Element Forces - Area Sheils Part 1 of 3. Columns: Area, AreaElem, Elem, Joint, OutputCase, F11, F22, F12. Rows include elements 660-670 with various force values.

Table 25: Element Forces - Area Sheils Part 1 of 3. Columns: Area, AreaElem, Elem, Joint, OutputCase, F11, F22, F12. Rows include elements 662-673 with various force values.

Table 25: Element Forces - Area Sheils Part 1 of 3. Columns: Area, AreaElem, Elem, Joint, OutputCase, F11, F22, F12. Rows include elements 664-674 with various force values.

Table 25: Element Forces - Area Sheils Part 1 of 3. Columns: Area, AreaElem, Elem, Joint, OutputCase, F11, F22, F12. Rows include elements 665-676 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 667-668 with various joint and output case combinations.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 668-670 with various joint and output case combinations.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 670-671 with various joint and output case combinations.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 671-672 with various joint and output case combinations.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 673-674 with various joint and output case combinations.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 674-676 with various joint and output case combinations.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 676-678 with various joint and output case combinations.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 678-679 with various joint and output case combinations.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 679-681 with various joint and output case combinations.

Table with 13 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3, F11, F12, F13. Rows 681-692.

Table with 13 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3, F11, F12, F13. Rows 692-984.

Table with 13 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3, F11, F12, F13. Rows 984-1276.

Table with 13 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3, F11, F12, F13. Rows 1276-1568.

Table with 13 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3, F11, F12, F13. Rows 1568-1860.

Table with 13 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3, F11, F12, F13. Rows 1860-2152.

Table with 13 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3, F11, F12, F13. Rows 2152-3000.

Table with 13 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3, F11, F12, F13. Rows 3000-3848.

Table with 13 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3, F11, F12, F13. Rows 3848-4704.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 695-696 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 696-697 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 698-699 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 699-700 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 701-702 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 703-704 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 704-705 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 706-707 with various force values.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include elements 707-708 with various force values.

Table 25: Element Forces - Area Sheils. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for areas 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724.

Table 25: Element Forces - Area Sheils. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for areas 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724.

Table 25: Element Forces - Area Sheils. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for areas 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724.

Table 25: Element Forces - Area Sheils. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for areas 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724.

Table 25: Element Forces - Area Sheils. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for areas 715, 716, 717, 718, 719, 720, 721, 722, 723, 724.

Table 25: Element Forces - Area Sheils. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for areas 717, 718, 719, 720, 721, 722, 723, 724.

Table 25: Element Forces - Area Sheils. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for areas 718, 719, 720, 721, 722, 723, 724.

Table 25: Element Forces - Area Sheils. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for areas 720, 721, 722, 723, 724.

Table 25: Element Forces - Area Sheils. Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows include data for areas 721, 722, 723, 724.

Table with 11 columns: Area, AreaElem, Joint, Element, Area, Shell, Part 1 of 3, F11, F22, F12. Contains structural analysis data for various elements.

Table with 11 columns: Area, AreaElem, Joint, Element, Area, Shell, Part 1 of 3, F11, F22, F12. Contains structural analysis data for various elements.

Table with 11 columns: Area, AreaElem, Joint, Element, Area, Shell, Part 1 of 3, F11, F22, F12. Contains structural analysis data for various elements.

Table with 11 columns: Area, AreaElem, Joint, Element, Area, Shell, Part 1 of 3, F11, F22, F12. Contains structural analysis data for various elements.

Table with 11 columns: Area, AreaElem, Joint, Element, Area, Shell, Part 1 of 3, F11, F22, F12. Contains structural analysis data for various elements.

Table with 11 columns: Area, AreaElem, Joint, Element, Area, Shell, Part 1 of 3, F11, F22, F12. Contains structural analysis data for various elements.

Table with 11 columns: Area, AreaElem, Joint, Element, Area, Shell, Part 1 of 3, F11, F22, F12. Contains structural analysis data for various elements.

Table with 11 columns: Area, AreaElem, Joint, Element, Area, Shell, Part 1 of 3, F11, F22, F12. Contains structural analysis data for various elements.

Table with 11 columns: Area, AreaElem, Joint, Element, Area, Shell, Part 1 of 3, F11, F22, F12. Contains structural analysis data for various elements.

Table with 10 columns: Area, AreaElem, Joint, Element, Area, Sheft, Part 1 of 3, F11, F22, F12. Rows include elements 727-739.

Table with 10 columns: Area, AreaElem, Joint, Element, Area, Sheft, Part 1 of 3, F11, F22, F12. Rows include elements 739-740.

Table with 10 columns: Area, AreaElem, Joint, Element, Area, Sheft, Part 1 of 3, F11, F22, F12. Rows include elements 740-742.

Table with 10 columns: Area, AreaElem, Joint, Element, Area, Sheft, Part 1 of 3, F11, F22, F12. Rows include elements 742-743.

Table with 10 columns: Area, AreaElem, Joint, Element, Area, Sheft, Part 1 of 3, F11, F22, F12. Rows include elements 743-744.

Table with 10 columns: Area, AreaElem, Joint, Element, Area, Sheft, Part 1 of 3, F11, F22, F12. Rows include elements 744-745.

Table with 10 columns: Area, AreaElem, Joint, Element, Area, Sheft, Part 1 of 3, F11, F22, F12. Rows include elements 746-747.

Table with 10 columns: Area, AreaElem, Joint, Element, Area, Sheft, Part 1 of 3, F11, F22, F12. Rows include elements 747-748.

Table with 10 columns: Area, AreaElem, Joint, Element, Area, Sheft, Part 1 of 3, F11, F22, F12. Rows include elements 748-751.

| Area | | AreaElem | Joint | OutputCase | F11 K/Nm | F22 K/Nm | F12 K/Nm |
|------|-----|----------|----------|------------|-------------|-------------|-------------|
| 765 | 765 | 1403 | -Torsion | SSIMO | 0. | 0. | 0. |
| 765 | 765 | 1404 | X | | | | |
| 765 | 765 | 1512 | -Torsion | SSIMO | 0. | 0. | 0. |
| 765 | 765 | 1511 | X | | | | |
| 765 | 765 | 1403 | -Torsion | SSIMO | 0. | 0. | 0. |
| 765 | 765 | 1404 | X | | | | |
| 765 | 765 | 1512 | -Torsion | SSIMO | 0. | 0. | 0. |
| 765 | 765 | 1511 | Y | | | | |
| 766 | 766 | 1406 | DO | -2.71 | -10.83 | 4.364E-06 | |
| 766 | 766 | 1407 | X | | | | |
| 766 | 766 | 1514 | DO | -2.71 | -10.83 | 4.928E-06 | |
| 766 | 766 | 1515 | DO | -2.71 | -10.83 | 4.928E-06 | |
| 766 | 766 | 1406 | DL | -0.69 | -2.77 | 2.184E-05 | |
| 766 | 766 | 1407 | DL | -0.69 | -2.78 | 2.185E-05 | |
| 766 | 766 | 1514 | DL | -0.69 | -2.77 | 2.244E-05 | |
| 766 | 766 | 1515 | DL | -0.69 | -2.77 | 2.244E-05 | |
| 766 | 766 | 1406 | LL | -0.28 | -1.11 | 1.142E-06 | |
| 766 | 766 | 1407 | LL | -0.28 | -1.11 | 1.142E-06 | |
| 766 | 766 | 1515 | LL | -0.28 | -1.11 | 9.646E-07 | |
| 766 | 766 | 1514 | X | | | | |
| 766 | 766 | 1407 | SISMO X | 0. | 0. | 0. | |
| 766 | 766 | 1515 | SISMO X | 0. | 0. | 0. | |
| 766 | 766 | 1514 | SISMO X | 0. | 0. | 0. | |
| 766 | 766 | 1406 | SISMO Y | 0. | 0. | 0. | |
| 766 | 766 | 1407 | SISMO Y | 0. | 0. | 0. | |
| 766 | 766 | 1515 | SISMO Y | 0. | 0. | 0. | |
| 766 | 766 | 1514 | SISMO Y | 0. | 0. | 0. | |
| 766 | 766 | 1406 | SISMO Z | 0. | 0. | 0. | |
| 766 | 766 | 1407 | SISMO Z | 0. | 0. | 0. | |
| 766 | 766 | 1515 | SISMO Z | 0. | 0. | 0. | |
| 766 | 766 | 1514 | SISMO Z | 0. | 0. | 0. | |
| 767 | 767 | 1408 | DO | -1.46 | -5.85 | -0.59 | |
| 767 | 767 | 1409 | DO | -1.74 | -6.96 | -0.56 | |
| 767 | 767 | 1517 | DO | -1.74 | -6.96 | -0.69 | |
| 767 | 767 | 1516 | DO | -1.46 | -5.85 | -0.73 | |
| 767 | 767 | 1408 | DL | -0.2 | -0.78 | -0.32 | |

| Area | | AreaElem | Joint | OutputCase | F11 K/Nm | F22 K/Nm | F12 K/Nm |
|------|-----|----------|---------|------------|-------------|-------------|-------------|
| 767 | 767 | 1409 | DL | -0.23 | -0.93 | -0.31 | |
| 767 | 767 | 1517 | DL | -0.23 | -0.93 | -0.32 | |
| 767 | 767 | 1516 | DL | -0.2 | -0.78 | -0.34 | |
| 767 | 767 | 1408 | LL | -0.13 | -0.53 | -0.19 | |
| 767 | 767 | 1517 | LL | -5.686E-02 | -0.22 | -0.14 | |
| 767 | 767 | 1516 | LL | -0.13 | -0.53 | -0.15 | |
| 767 | 767 | 1408 | SISMO X | 0. | 0. | 0. | |
| 767 | 767 | 1409 | SISMO X | 0. | 0. | 0. | |
| 767 | 767 | 1517 | SISMO X | 0. | 0. | 0. | |
| 767 | 767 | 1408 | SISMO Y | 0. | 0. | 0. | |
| 767 | 767 | 1409 | SISMO Y | 0. | 0. | 0. | |
| 767 | 767 | 1517 | SISMO Y | 0. | 0. | 0. | |
| 767 | 767 | 1516 | SISMO Y | 0. | 0. | 0. | |
| 767 | 767 | 1408 | SISMO Z | 0. | 0. | 0. | |
| 767 | 767 | 1409 | SISMO Z | 0. | 0. | 0. | |
| 767 | 767 | 1517 | SISMO Z | 0. | 0. | 0. | |
| 767 | 767 | 1516 | SISMO Z | 0. | 0. | 0. | |
| 767 | 767 | 1408 | SISMO X | 0. | 0. | 0. | |
| 767 | 767 | 1409 | SISMO X | 0. | 0. | 0. | |
| 767 | 767 | 1517 | SISMO X | 0. | 0. | 0. | |
| 767 | 767 | 1516 | SISMO X | 0. | 0. | 0. | |
| 767 | 767 | 1408 | SISMO Y | 0. | 0. | 0. | |
| 767 | 767 | 1409 | SISMO Y | 0. | 0. | 0. | |
| 767 | 767 | 1517 | SISMO Y | 0. | 0. | 0. | |
| 767 | 767 | 1516 | SISMO Y | 0. | 0. | 0. | |
| 767 | 767 | 1408 | SISMO Z | 0. | 0. | 0. | |
| 767 | 767 | 1409 | SISMO Z | 0. | 0. | 0. | |
| 767 | 767 | 1517 | SISMO Z | 0. | 0. | 0. | |
| 767 | 767 | 1516 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1411 | DO | -1.49 | -5.95 | -0.48 | |
| 768 | 768 | 1410 | DO | -1.6 | -6.42 | -0.43 | |
| 768 | 768 | 1518 | DO | -1.6 | -6.42 | -0.6 | |
| 768 | 768 | 1519 | DO | -1.49 | -5.95 | -0.55 | |
| 768 | 768 | 1411 | DL | -0.27 | -0.8 | -0.26 | |
| 768 | 768 | 1410 | DL | -0.21 | -0.85 | -0.24 | |
| 768 | 768 | 1518 | DL | -0.21 | -0.85 | -0.25 | |
| 768 | 768 | 1519 | DL | -0.21 | -0.8 | -0.27 | |
| 768 | 768 | 1411 | LL | -0.13 | -0.51 | -0.16 | |
| 768 | 768 | 1410 | LL | -9.354E-02 | -0.37 | -0.15 | |
| 768 | 768 | 1518 | LL | -9.354E-02 | -0.37 | -0.13 | |
| 768 | 768 | 1411 | LL | -0.13 | -0.51 | -0.14 | |
| 768 | 768 | 1411 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO X | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Y | 0. | 0. | 0. | |
| 768 | 768 | 1411 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1410 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1518 | SISMO Z | 0. | 0. | 0. | |
| 768 | 768 | 1519 | SISMO Z | 0. | 0. | 0. | |

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 779 779 1449, 779 779 1557, etc.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 781 781 1456, 781 781 1457, etc.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 782 782 1456, 782 782 1457, etc.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 784 784 1559, 784 784 1560, etc.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 785 785 1543, 785 785 1542, etc.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 787 787 1467, 787 787 1477, etc.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 789 789 1463, 789 789 1464, etc.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 790 790 1461, 790 790 1462, etc.

Table 25: Element Forces - Area Shefts, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12. Rows: 792 792 1541, 792 792 1432, etc.

Table with 7 columns: Area, AreaElem, Joint, Element Forces, Area Shefts, Part 1 of 3. Rows include data for Area 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804.

Table with 7 columns: Area, AreaElem, Joint, Element Forces, Area Shefts, Part 1 of 3. Rows include data for Area 795, 796, 797, 798, 799, 800, 801, 802, 803, 804.

Table with 7 columns: Area, AreaElem, Joint, Element Forces, Area Shefts, Part 1 of 3. Rows include data for Area 796, 797, 798, 799, 800, 801, 802, 803, 804.

Table with 7 columns: Area, AreaElem, Joint, Element Forces, Area Shefts, Part 1 of 3. Rows include data for Area 798, 799, 800, 801, 802, 803, 804.

Table with 7 columns: Area, AreaElem, Joint, Element Forces, Area Shefts, Part 1 of 3. Rows include data for Area 799, 800, 801, 802, 803, 804.

Table with 7 columns: Area, AreaElem, Joint, Element Forces, Area Shefts, Part 1 of 3. Rows include data for Area 801, 802, 803, 804.

Table with 7 columns: Area, AreaElem, Joint, Element Forces, Area Shefts, Part 1 of 3. Rows include data for Area 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840.

Table with 7 columns: Area, AreaElem, Joint, Element Forces, Area Shefts, Part 1 of 3. Rows include data for Area 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840.

Table with 7 columns: Area, AreaElem, Joint, Element Forces, Area Shefts, Part 1 of 3. Rows include data for Area 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840.

Table with 10 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3. Rows include data for elements 807-809 and 808-810.

Table with 10 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3. Rows include data for elements 809-810 and 810-811.

Table with 10 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3. Rows include data for elements 810-811 and 811-812.

Table with 10 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3. Rows include data for elements 812-813 and 813-814.

Table with 10 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3. Rows include data for elements 814-815 and 815-816.

Table with 10 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3. Rows include data for elements 816-817 and 817-818.

Table with 10 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3. Rows include data for elements 817-818 and 818-819.

Table with 10 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3. Rows include data for elements 819-820 and 820-821.

Table with 10 columns: Area, AreaElem, Joint, Element Forces, Area, Shefts, Part 1 of 3. Rows include data for elements 821-822 and 822-823.

Table 25: Element Forces - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12, K11, K22, K12. Rows include data for areas 821-823 and joints 1534-1557.

Table 25: Element Forces - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12, K11, K22, K12. Rows include data for areas 823-824 and joints 1557-1960.

Table 25: Element Forces - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12, K11, K22, K12. Rows include data for areas 824-826 and joints 1546-1974.

Table 25: Element Forces - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12, K11, K22, K12. Rows include data for areas 826-828 and joints 1557-1974.

Table 25: Element Forces - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12, K11, K22, K12. Rows include data for areas 828-829 and joints 1559-1990.

Table 25: Element Forces - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12, K11, K22, K12. Rows include data for areas 829-830 and joints 1591-2026.

Table 25: Element Forces - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, F11, F22, F12, K11, K22, K12. Rows include data for areas 831-832 and joints 1599-1974.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Joint, OutputCase, F11, F22, F12, K11, K22, K12. Rows include data for areas 67-68 and joints 511-512.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Joint, OutputCase, F11, F22, F12, K11, K22, K12. Rows include data for areas 68-69 and joints 511-512.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M11, M22, M33), Area Shells (KN-mm, KN-nm, KN-cm).

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M11, M22, M33), Area Shells (KN-mm, KN-nm, KN-cm).

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M11, M22, M33), Area Shells (KN-mm, KN-nm, KN-cm).

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M11, M22, M33), Area Shells (KN-mm, KN-nm, KN-cm).

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M11, M22, M33), Area Shells (KN-mm, KN-nm, KN-cm).

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M11, M22, M33), Area Shells (KN-mm, KN-nm, KN-cm).

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M11, M22, M33), Area Shells (KN-mm, KN-nm, KN-cm).

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M11, M22, M33), Area Shells (KN-mm, KN-nm, KN-cm).

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M11, M22, M33), Area Shells (KN-mm, KN-nm, KN-cm).

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 83-84.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 85-86.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 87-88.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 89-90.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 91-92.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 93-94.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 95-96.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 97-98.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 99-100.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-mm, KN-mm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-mm, KN-mm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-mm, KN-mm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-mm, KN-mm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-mm, KN-mm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-mm, KN-mm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-mm, KN-mm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-mm, KN-mm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-mm, KN-mm).

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, M11, M22, M12. Rows include element IDs and force values for various cases.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, M11, M22, M12. Rows include element IDs and force values for various cases.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, M11, M22, M12. Rows include element IDs and force values for various cases.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, M11, M22, M12. Rows include element IDs and force values for various cases.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, M11, M22, M12. Rows include element IDs and force values for various cases.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, M11, M22, M12. Rows include element IDs and force values for various cases.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, M11, M22, M12. Rows include element IDs and force values for various cases.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, M11, M22, M12. Rows include element IDs and force values for various cases.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, JNode, OutputCase, M11, M22, M12. Rows include element IDs and force values for various cases.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, M1, M2, M12. Rows 484-485.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, M1, M2, M12. Rows 486-487.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, M1, M2, M12. Rows 488-489.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, M1, M2, M12. Rows 490-491.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, M1, M2, M12. Rows 492-493.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, M1, M2, M12. Rows 494-495.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, M1, M2, M12. Rows 496-497.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, M1, M2, M12. Rows 498-499.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, M1, M2, M12. Rows 500-501.

Table with 10 columns: Area, Jcser, Element, Forces, Area Shells, Part 2 of 3. Rows include data for areas 500-604 with various elements like DO, DL, LL, and SISMO.

Table with 10 columns: Area, Jcser, Element, Forces, Area Shells, Part 2 of 3. Rows include data for areas 501-604 with various elements like DO, DL, LL, and SISMO.

Table with 10 columns: Area, Jcser, Element, Forces, Area Shells, Part 2 of 3. Rows include data for areas 503-604 with various elements like DO, DL, LL, and SISMO.

Table with 10 columns: Area, Jcser, Element, Forces, Area Shells, Part 2 of 3. Rows include data for areas 504-610 with various elements like DO, DL, LL, and SISMO.

Table with 10 columns: Area, Jcser, Element, Forces, Area Shells, Part 2 of 3. Rows include data for areas 506-610 with various elements like DO, DL, LL, and SISMO.

Table with 10 columns: Area, Jcser, Element, Forces, Area Shells, Part 2 of 3. Rows include data for areas 507-610 with various elements like DO, DL, LL, and SISMO.

Table with 10 columns: Area, Jcser, Element, Forces, Area Shells, Part 2 of 3. Rows include data for areas 509-625 with various elements like DO, DL, LL, and SISMO.

Table with 10 columns: Area, Jcser, Element, Forces, Area Shells, Part 2 of 3. Rows include data for areas 511-625 with various elements like DO, DL, LL, and SISMO.

Table with 10 columns: Area, Jcser, Element, Forces, Area Shells, Part 2 of 3. Rows include data for areas 512-625 with various elements like DO, DL, LL, and SISMO.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jcode, OutputCase, Element, Area Shells, M11, M12, M21, M22. Rows 514-634.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jcode, OutputCase, Element, Area Shells, M11, M12, M21, M22. Rows 515-634.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jcode, OutputCase, Element, Area Shells, M11, M12, M21, M22. Rows 517-634.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jcode, OutputCase, Element, Area Shells, M11, M12, M21, M22. Rows 518-644.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jcode, OutputCase, Element, Area Shells, M11, M12, M21, M22. Rows 520-644.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jcode, OutputCase, Element, Area Shells, M11, M12, M21, M22. Rows 521-644.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jcode, OutputCase, Element, Area Shells, M11, M12, M21, M22. Rows 523-644.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jcode, OutputCase, Element, Area Shells, M11, M12, M21, M22. Rows 525-644.

Table 25. Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jcode, OutputCase, Element, Area Shells, M11, M12, M21, M22. Rows 526-644.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN/mm, KN/mm, KN/mm). Rows include elements 528-688 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN/mm, KN/mm, KN/mm). Rows include elements 529-688 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN/mm, KN/mm, KN/mm). Rows include elements 531-688 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN/mm, KN/mm, KN/mm). Rows include elements 532-688 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN/mm, KN/mm, KN/mm). Rows include elements 534-688 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN/mm, KN/mm, KN/mm). Rows include elements 536-688 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN/mm, KN/mm, KN/mm). Rows include elements 537-688 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN/mm, KN/mm, KN/mm). Rows include elements 539-688 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN/mm, KN/mm, KN/mm). Rows include elements 540-688 with various force values.

Table with 5 columns: Area, Jcswr, Element, OutputCase, M12. Rows 556-557 showing various element types like SISMO X, SISMO Y, and DO.

Table with 5 columns: Area, Jcswr, Element, OutputCase, M12. Rows 557-558 showing various element types like SISMO X, SISMO Y, and DO.

Table with 5 columns: Area, Jcswr, Element, OutputCase, M12. Rows 559-561 showing various element types like SISMO Y, SISMO X, and DO.

Table with 5 columns: Area, Jcswr, Element, OutputCase, M12. Rows 561-562 showing various element types like DO, SISMO X, SISMO Y, and DL.

Table with 5 columns: Area, Jcswr, Element, OutputCase, M12. Rows 562-564 showing various element types like SISMO X, SISMO Y, and DO.

Table with 5 columns: Area, Jcswr, Element, OutputCase, M12. Rows 564-565 showing various element types like DL, SISMO X, SISMO Y, and DO.

Table with 5 columns: Area, Jcswr, Element, OutputCase, M12. Rows 565-567 showing various element types like SISMO X, SISMO Y, and DO.

Table with 5 columns: Area, Jcswr, Element, OutputCase, M12. Rows 567-568 showing various element types like SISMO X, SISMO Y, and DO.

Table with 5 columns: Area, Jcswr, Element, OutputCase, M12. Rows 568-570 showing various element types like SISMO X, SISMO Y, and DO.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Joint, OutputCase, M1, M2, KN-mm, KN-nm. Rows 570-571 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Joint, OutputCase, M1, M2, KN-mm, KN-nm. Rows 571-573 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Joint, OutputCase, M1, M2, KN-mm, KN-nm. Rows 573-575 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Joint, OutputCase, M1, M2, KN-mm, KN-nm. Rows 575-576 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Joint, OutputCase, M1, M2, KN-mm, KN-nm. Rows 576-578 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Joint, OutputCase, M1, M2, KN-mm, KN-nm. Rows 578-579 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Joint, OutputCase, M1, M2, KN-mm, KN-nm. Rows 579-581 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Joint, OutputCase, M1, M2, KN-mm, KN-nm. Rows 581-582 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Joint, OutputCase, M1, M2, KN-mm, KN-nm. Rows 582-584 with various force values.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 584-596.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 596-697.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 697-798.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 798-899.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 899-1000.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 1000-1101.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 1101-1202.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 1202-1303.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Shells (KN-mm, KN-nm, KN-nm). Rows 1303-1404.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jcser, OutputCase, M11, M22, M12. Rows include elements 598-600 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jcser, OutputCase, M11, M22, M12. Rows include elements 600-602 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jcser, OutputCase, M11, M22, M12. Rows include elements 601-603 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jcser, OutputCase, M11, M22, M12. Rows include elements 603-605 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jcser, OutputCase, M11, M22, M12. Rows include elements 604-606 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jcser, OutputCase, M11, M22, M12. Rows include elements 606-608 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jcser, OutputCase, M11, M22, M12. Rows include elements 607-609 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jcser, OutputCase, M11, M22, M12. Rows include elements 609-611 with various force values.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jcser, OutputCase, M11, M22, M12. Rows include elements 611-613 with various force values.

| Area | Jesse | OutputCase | Element Forces - Area Sheils, Part 2 of 3 | | |
|------|-------|---------------|---|-------------|-------------|
| | | | M1 KN-mm | M2 KN-mm | M3 KN-mm |
| 612 | 1237 | -Torsion/SIMO | 0. | 0. | 0. |
| 612 | 1236 | -Torsion/SIMO | 0. | 0. | 0. |
| 612 | 1344 | -Torsion/SIMO | 0. | 0. | 0. |
| 612 | 1345 | -Torsion/SIMO | 0. | 0. | 0. |
| 612 | 1237 | -Torsion/SIMO | 0. | 0. | 0. |
| 612 | 1236 | -Torsion/SIMO | 0. | 0. | 0. |
| 612 | 1344 | -Torsion/SIMO | 0. | 0. | 0. |
| 612 | 1345 | -Torsion/SIMO | 0. | 0. | 0. |

| Area | Jesse | OutputCase | Element Forces - Area Sheils, Part 2 of 3 | | |
|------|-------|------------|---|-------------|-------------|
| | | | M1 KN-mm | M2 KN-mm | M3 KN-mm |
| 614 | 1348 | DL | -1.631E-04 | -6.523E-04 | -8.463E-06 |
| 614 | 1347 | DL | -2.183E-04 | -6.541E-04 | -8.463E-06 |
| 614 | 1239 | DL | 1.908E-04 | 7.631E-04 | -4.582E-06 |
| 614 | 1348 | LL | 1.372E-04 | 5.108E-04 | -6.307E-07 |
| 614 | 1347 | LL | -1.830E-04 | -6.441E-04 | -8.436E-07 |

| Area | Jesse | OutputCase | Element Forces - Area Sheils, Part 2 of 3 | | |
|------|-------|---------------|---|-------------|-------------|
| | | | M1 KN-mm | M2 KN-mm | M3 KN-mm |
| 615 | 1346 | -Torsion/SIMO | 0. | 0. | 0. |
| 615 | 1347 | -Torsion/SIMO | 0. | 0. | 0. |
| 615 | 1238 | -Torsion/SIMO | 0. | 0. | 0. |
| 615 | 1239 | -Torsion/SIMO | 0. | 0. | 0. |
| 615 | 1346 | -Torsion/SIMO | 0. | 0. | 0. |
| 615 | 1347 | -Torsion/SIMO | 0. | 0. | 0. |

| Area | Jesse | OutputCase | Element Forces - Area Sheils, Part 2 of 3 | | |
|------|-------|------------|---|-------------|-------------|
| | | | M1 KN-mm | M2 KN-mm | M3 KN-mm |
| 617 | 1219 | LL | -9.952E-07 | -3.939E-06 | -2.284E-08 |
| 617 | 1219 | LL | -6.431E-07 | -2.623E-06 | -1.866E-08 |
| 617 | 1218 | SIMO X | 0. | 0. | 0. |
| 617 | 1219 | SIMO X | 0. | 0. | 0. |
| 617 | 1218 | SIMO Y | 0. | 0. | 0. |
| 617 | 1219 | SIMO Y | 0. | 0. | 0. |
| 617 | 1218 | SIMO Z | 0. | 0. | 0. |
| 617 | 1219 | SIMO Z | 0. | 0. | 0. |

| Area | Jesse | OutputCase | Element Forces - Area Sheils, Part 2 of 3 | | |
|------|-------|---------------|---|-------------|-------------|
| | | | M1 KN-mm | M2 KN-mm | M3 KN-mm |
| 618 | 1220 | -Torsion/SIMO | 0. | 0. | 0. |
| 618 | 1238 | -Torsion/SIMO | 0. | 0. | 0. |
| 618 | 1239 | -Torsion/SIMO | 0. | 0. | 0. |
| 618 | 1220 | DO | -5.331E-06 | -2.132E-05 | -2.219E-06 |
| 618 | 1220 | DO | 1.513E-06 | 6.025E-06 | -2.219E-06 |
| 618 | 1238 | DO | 2.306E-06 | 1.105E-05 | -2.045E-06 |
| 618 | 1239 | DO | -1.134E-07 | -4.838E-07 | 2.045E-06 |

| Area | Jesse | OutputCase | Element Forces - Area Sheils, Part 2 of 3 | | |
|------|-------|---------------|---|-------------|-------------|
| | | | M1 KN-mm | M2 KN-mm | M3 KN-mm |
| 620 | 1357 | SIMO X | 0. | 0. | 0. |
| 620 | 1358 | SIMO X | 0. | 0. | 0. |
| 620 | 1250 | SIMO Y | 0. | 0. | 0. |
| 620 | 1249 | SIMO Y | 0. | 0. | 0. |
| 620 | 1357 | SIMO Z | 0. | 0. | 0. |
| 620 | 1250 | -Torsion/SIMO | 0. | 0. | 0. |

| Area | Jesse | OutputCase | Element Forces - Area Sheils, Part 2 of 3 | | |
|------|-------|---------------|---|-------------|-------------|
| | | | M1 KN-mm | M2 KN-mm | M3 KN-mm |
| 621 | 1356 | -Torsion/SIMO | 0. | 0. | 0. |
| 622 | 1245 | DO | -4.874E-10 | -1.950E-09 | -4.869E-08 |
| 622 | 1246 | DO | -8.989E-09 | -3.436E-08 | -4.969E-08 |
| 622 | 1354 | DO | -6.939E-09 | -2.014E-08 | -9.246E-08 |
| 622 | 1353 | DO | -6.369E-10 | -2.548E-09 | -9.246E-08 |

| Area | Jesse | OutputCase | Element Forces - Area Sheils, Part 2 of 3 | | |
|------|-------|---------------|---|-------------|-------------|
| | | | M1 KN-mm | M2 KN-mm | M3 KN-mm |
| 623 | 1351 | SIMO X | 0. | 0. | 0. |
| 623 | 1244 | -Torsion/SIMO | 0. | 0. | 0. |
| 623 | 1243 | -Torsion/SIMO | 0. | 0. | 0. |
| 623 | 1351 | -Torsion/SIMO | 0. | 0. | 0. |
| 623 | 1242 | -Torsion/SIMO | 0. | 0. | 0. |
| 623 | 1354 | -Torsion/SIMO | 0. | 0. | 0. |
| 623 | 1243 | -Torsion/SIMO | 0. | 0. | 0. |

| Area | Jesse | OutputCase | Element Forces - Area Sheils, Part 2 of 3 | | |
|------|-------|------------|---|-------------|-------------|
| | | | M1 KN-mm | M2 KN-mm | M3 KN-mm |
| 625 | 1319 | DO | 9.001E-02 | 0.006 | -1.712E-04 |
| 625 | 1211 | DO | -2.202E-04 | 2.001E-01 | -1.346E-04 |
| 625 | 1210 | DO | 3.827E-04 | 0.0019 | -1.346E-04 |
| 625 | 1318 | DL | -4.124E-04 | 0.0021 | -1.294E-04 |
| 625 | 1319 | DL | 1.818E-04 | 9.406E-04 | -1.294E-04 |

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M22, M12. Rows 626-1317.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M22, M12. Rows 628-1337.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M22, M12. Rows 629-1337.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M22, M12. Rows 631-1337.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M22, M12. Rows 632-1337.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M22, M12. Rows 634-1337.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M22, M12. Rows 636-1362.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M22, M12. Rows 637-1362.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M22, M12. Rows 639-1362.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M12, M13. Rows 640-642.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M12, M13. Rows 642-643.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M12, M13. Rows 643-645.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M12, M13. Rows 645-646.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M12, M13. Rows 646-648.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M12, M13. Rows 648-650.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M12, M13. Rows 650-651.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M12, M13. Rows 651-652.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jwel, OutputCase, M11, M12, M13. Rows 652-654.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Case, M1, M2, M12. Rows include data for areas 682 to 684 across various output cases and shell types.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Case, M1, M2, M12. Rows include data for areas 684 to 686 across various output cases and shell types.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Case, M1, M2, M12. Rows include data for areas 686 to 687 across various output cases and shell types.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Case, M1, M2, M12. Rows include data for areas 687 to 689 across various output cases and shell types.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Case, M1, M2, M12. Rows include data for areas 689 to 690 across various output cases and shell types.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Case, M1, M2, M12. Rows include data for areas 690 to 692 across various output cases and shell types.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Case, M1, M2, M12. Rows include data for areas 692 to 693 across various output cases and shell types.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Case, M1, M2, M12. Rows include data for areas 693 to 695 across various output cases and shell types.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Case, M1, M2, M12. Rows include data for areas 695 to 696 across various output cases and shell types.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Cause, M11, M12, M13. Rows 696-908.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Cause, M11, M12, M13. Rows 698-908.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Cause, M11, M12, M13. Rows 700-910.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Cause, M11, M12, M13. Rows 701-910.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Cause, M11, M12, M13. Rows 703-910.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Cause, M11, M12, M13. Rows 704-910.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Cause, M11, M12, M13. Rows 706-910.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Cause, M11, M12, M13. Rows 707-910.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Javel, Output/Cause, M11, M12, M13. Rows 709-910.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Sheils (KN-mm, KN-nm, KN-cm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Sheils (KN-mm, KN-nm, KN-cm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Sheils (KN-mm, KN-nm, KN-cm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Sheils (KN-mm, KN-nm, KN-cm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Sheils (KN-mm, KN-nm, KN-cm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Sheils (KN-mm, KN-nm, KN-cm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Sheils (KN-mm, KN-nm, KN-cm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Sheils (KN-mm, KN-nm, KN-cm).

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, Javel, OutputCase, Element Forces (M1, M2, M12), Area Sheils (KN-mm, KN-nm, KN-cm).

Table with 11 columns: Area, Jcsw, Element, OutputCase, Area Sheils, Par1 of 3, M12, M21, M32, KN,mm, KN,mm, KN,mm. Contains data for areas 753-754 and 755-756.

Table with 11 columns: Area, Jcsw, Element, OutputCase, Area Sheils, Par1 of 3, M12, M21, M32, KN,mm, KN,mm, KN,mm. Contains data for areas 754-756 and 757-759.

Table with 11 columns: Area, Jcsw, Element, OutputCase, Area Sheils, Par1 of 3, M12, M21, M32, KN,mm, KN,mm, KN,mm. Contains data for areas 756-759 and 760-762.

Table with 11 columns: Area, Jcsw, Element, OutputCase, Area Sheils, Par1 of 3, M12, M21, M32, KN,mm, KN,mm, KN,mm. Contains data for areas 757-759 and 760-762.

Table with 11 columns: Area, Jcsw, Element, OutputCase, Area Sheils, Par1 of 3, M12, M21, M32, KN,mm, KN,mm, KN,mm. Contains data for areas 759-762 and 763-765.

Table with 11 columns: Area, Jcsw, Element, OutputCase, Area Sheils, Par1 of 3, M12, M21, M32, KN,mm, KN,mm, KN,mm. Contains data for areas 760-762 and 763-765.

Table with 11 columns: Area, Jcsw, Element, OutputCase, Area Sheils, Par1 of 3, M12, M21, M32, KN,mm, KN,mm, KN,mm. Contains data for areas 762-765 and 766-768.

Table with 11 columns: Area, Jcsw, Element, OutputCase, Area Sheils, Par1 of 3, M12, M21, M32, KN,mm, KN,mm, KN,mm. Contains data for areas 764-768 and 769-771.

Table with 11 columns: Area, Jcsw, Element, OutputCase, Area Sheils, Par1 of 3, M12, M21, M32, KN,mm, KN,mm, KN,mm. Contains data for areas 765-768 and 769-771.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-nm, M12, M21, M32). Rows 767-788.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-nm, M12, M21, M32). Rows 789-900.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-nm, M12, M21, M32). Rows 901-1012.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-nm, M12, M21, M32). Rows 1013-1124.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-nm, M12, M21, M32). Rows 1125-1236.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-nm, M12, M21, M32). Rows 1237-1348.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-nm, M12, M21, M32). Rows 1349-1460.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-nm, M12, M21, M32). Rows 1461-1572.

Table 25: Element Forces - Area Sheils, Part 2 of 3. Columns: Area, JNode, OutputCase, Element Forces (M1, M2, M3), Area Sheils (KN-mm, KN-nm, M12, M21, M32). Rows 1573-1684.

| Area | Jawer | Element Forces | | Area Sheils, Part 2 of 3 | | M12 |
|------|-------|----------------|------------|--------------------------|------------|-------|
| | | OutputCase | M11 | M22 | M12 | |
| | | KN-mm | KN-mm | KN-mm | KN-mm | KN-mm |
| 781 | 1456 | LL | -1.101E-04 | -4.402E-04 | -3.028E-05 | |
| 781 | 1457 | SISMO X | 0 | 0 | 0 | |
| 781 | 1458 | SISMO Y | 0 | 0 | 0 | |
| 781 | 1459 | SISMO Z | 0 | 0 | 0 | |
| 781 | 1460 | SISMO X | 0 | 0 | 0 | |
| 781 | 1461 | SISMO Y | 0 | 0 | 0 | |
| 781 | 1462 | SISMO Z | 0 | 0 | 0 | |
| 781 | 1463 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1464 | X | 0 | 0 | 0 | |
| 781 | 1465 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1466 | Y | 0 | 0 | 0 | |
| 781 | 1467 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1468 | Z | 0 | 0 | 0 | |
| 781 | 1469 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1470 | X | 0 | 0 | 0 | |
| 781 | 1471 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1472 | Y | 0 | 0 | 0 | |
| 781 | 1473 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1474 | Z | 0 | 0 | 0 | |
| 781 | 1475 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1476 | X | 0 | 0 | 0 | |
| 781 | 1477 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1478 | Y | 0 | 0 | 0 | |
| 781 | 1479 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1480 | Z | 0 | 0 | 0 | |
| 781 | 1481 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1482 | X | 0 | 0 | 0 | |
| 781 | 1483 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1484 | Y | 0 | 0 | 0 | |
| 781 | 1485 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1486 | Z | 0 | 0 | 0 | |
| 781 | 1487 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1488 | X | 0 | 0 | 0 | |
| 781 | 1489 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1490 | Y | 0 | 0 | 0 | |
| 781 | 1491 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1492 | Z | 0 | 0 | 0 | |
| 781 | 1493 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1494 | X | 0 | 0 | 0 | |
| 781 | 1495 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1496 | Y | 0 | 0 | 0 | |
| 781 | 1497 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1498 | Z | 0 | 0 | 0 | |
| 781 | 1499 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1500 | X | 0 | 0 | 0 | |
| 781 | 1501 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1502 | Y | 0 | 0 | 0 | |
| 781 | 1503 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1504 | Z | 0 | 0 | 0 | |
| 781 | 1505 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1506 | X | 0 | 0 | 0 | |
| 781 | 1507 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1508 | Y | 0 | 0 | 0 | |
| 781 | 1509 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1510 | Z | 0 | 0 | 0 | |
| 781 | 1511 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1512 | X | 0 | 0 | 0 | |
| 781 | 1513 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1514 | Y | 0 | 0 | 0 | |
| 781 | 1515 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1516 | Z | 0 | 0 | 0 | |
| 781 | 1517 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1518 | X | 0 | 0 | 0 | |
| 781 | 1519 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1520 | Y | 0 | 0 | 0 | |
| 781 | 1521 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1522 | Z | 0 | 0 | 0 | |
| 781 | 1523 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1524 | X | 0 | 0 | 0 | |
| 781 | 1525 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1526 | Y | 0 | 0 | 0 | |
| 781 | 1527 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1528 | Z | 0 | 0 | 0 | |
| 781 | 1529 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1530 | X | 0 | 0 | 0 | |
| 781 | 1531 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1532 | Y | 0 | 0 | 0 | |
| 781 | 1533 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1534 | Z | 0 | 0 | 0 | |
| 781 | 1535 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1536 | X | 0 | 0 | 0 | |
| 781 | 1537 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1538 | Y | 0 | 0 | 0 | |
| 781 | 1539 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1540 | Z | 0 | 0 | 0 | |
| 781 | 1541 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1542 | X | 0 | 0 | 0 | |
| 781 | 1543 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1544 | Y | 0 | 0 | 0 | |
| 781 | 1545 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1546 | Z | 0 | 0 | 0 | |
| 781 | 1547 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1548 | X | 0 | 0 | 0 | |
| 781 | 1549 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1550 | Y | 0 | 0 | 0 | |
| 781 | 1551 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1552 | Z | 0 | 0 | 0 | |
| 781 | 1553 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1554 | X | 0 | 0 | 0 | |
| 781 | 1555 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1556 | Y | 0 | 0 | 0 | |
| 781 | 1557 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1558 | Z | 0 | 0 | 0 | |
| 781 | 1559 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1560 | X | 0 | 0 | 0 | |
| 781 | 1561 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1562 | Y | 0 | 0 | 0 | |
| 781 | 1563 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1564 | Z | 0 | 0 | 0 | |
| 781 | 1565 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1566 | X | 0 | 0 | 0 | |
| 781 | 1567 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1568 | Y | 0 | 0 | 0 | |
| 781 | 1569 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1570 | Z | 0 | 0 | 0 | |
| 781 | 1571 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1572 | X | 0 | 0 | 0 | |
| 781 | 1573 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1574 | Y | 0 | 0 | 0 | |
| 781 | 1575 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1576 | Z | 0 | 0 | 0 | |
| 781 | 1577 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1578 | X | 0 | 0 | 0 | |
| 781 | 1579 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1580 | Y | 0 | 0 | 0 | |
| 781 | 1581 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1582 | Z | 0 | 0 | 0 | |
| 781 | 1583 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1584 | X | 0 | 0 | 0 | |
| 781 | 1585 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1586 | Y | 0 | 0 | 0 | |
| 781 | 1587 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1588 | Z | 0 | 0 | 0 | |
| 781 | 1589 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1590 | X | 0 | 0 | 0 | |
| 781 | 1591 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1592 | Y | 0 | 0 | 0 | |
| 781 | 1593 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1594 | Z | 0 | 0 | 0 | |
| 781 | 1595 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1596 | X | 0 | 0 | 0 | |
| 781 | 1597 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1598 | Y | 0 | 0 | 0 | |
| 781 | 1599 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1600 | Z | 0 | 0 | 0 | |
| 781 | 1601 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1602 | X | 0 | 0 | 0 | |
| 781 | 1603 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1604 | Y | 0 | 0 | 0 | |
| 781 | 1605 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1606 | Z | 0 | 0 | 0 | |
| 781 | 1607 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1608 | X | 0 | 0 | 0 | |
| 781 | 1609 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1610 | Y | 0 | 0 | 0 | |
| 781 | 1611 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1612 | Z | 0 | 0 | 0 | |
| 781 | 1613 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1614 | X | 0 | 0 | 0 | |
| 781 | 1615 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1616 | Y | 0 | 0 | 0 | |
| 781 | 1617 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1618 | Z | 0 | 0 | 0 | |
| 781 | 1619 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1620 | X | 0 | 0 | 0 | |
| 781 | 1621 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1622 | Y | 0 | 0 | 0 | |
| 781 | 1623 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1624 | Z | 0 | 0 | 0 | |
| 781 | 1625 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1626 | X | 0 | 0 | 0 | |
| 781 | 1627 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1628 | Y | 0 | 0 | 0 | |
| 781 | 1629 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1630 | Z | 0 | 0 | 0 | |
| 781 | 1631 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1632 | X | 0 | 0 | 0 | |
| 781 | 1633 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1634 | Y | 0 | 0 | 0 | |
| 781 | 1635 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1636 | Z | 0 | 0 | 0 | |
| 781 | 1637 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1638 | X | 0 | 0 | 0 | |
| 781 | 1639 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1640 | Y | 0 | 0 | 0 | |
| 781 | 1641 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1642 | Z | 0 | 0 | 0 | |
| 781 | 1643 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1644 | X | 0 | 0 | 0 | |
| 781 | 1645 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1646 | Y | 0 | 0 | 0 | |
| 781 | 1647 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1648 | Z | 0 | 0 | 0 | |
| 781 | 1649 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1650 | X | 0 | 0 | 0 | |
| 781 | 1651 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1652 | Y | 0 | 0 | 0 | |
| 781 | 1653 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1654 | Z | 0 | 0 | 0 | |
| 781 | 1655 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1656 | X | 0 | 0 | 0 | |
| 781 | 1657 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1658 | Y | 0 | 0 | 0 | |
| 781 | 1659 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1660 | Z | 0 | 0 | 0 | |
| 781 | 1661 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1662 | X | 0 | 0 | 0 | |
| 781 | 1663 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1664 | Y | 0 | 0 | 0 | |
| 781 | 1665 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1666 | Z | 0 | 0 | 0 | |
| 781 | 1667 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1668 | X | 0 | 0 | 0 | |
| 781 | 1669 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1670 | Y | 0 | 0 | 0 | |
| 781 | 1671 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1672 | Z | 0 | 0 | 0 | |
| 781 | 1673 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1674 | X | 0 | 0 | 0 | |
| 781 | 1675 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1676 | Y | 0 | 0 | 0 | |
| 781 | 1677 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1678 | Z | 0 | 0 | 0 | |
| 781 | 1679 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1680 | X | 0 | 0 | 0 | |
| 781 | 1681 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1682 | Y | 0 | 0 | 0 | |
| 781 | 1683 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1684 | Z | 0 | 0 | 0 | |
| 781 | 1685 | -Torsion/SISMO | 0 | 0 | 0 | |
| 781 | 1686 | X | 0 | 0 | 0 | |
| 781 | 1687 | - | | | | |

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jset, OutputCase, M11, M12, M21, M22. Rows include elements 795-1534 with various force values.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jset, OutputCase, M11, M12, M21, M22. Rows include elements 796-1445 with various force values.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jset, OutputCase, M11, M12, M21, M22. Rows include elements 798-1561 with various force values.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jset, OutputCase, M11, M12, M21, M22. Rows include elements 800-1550 with various force values.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jset, OutputCase, M11, M12, M21, M22. Rows include elements 801-1552 with various force values.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jset, OutputCase, M11, M12, M21, M22. Rows include elements 803-1556 with various force values.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jset, OutputCase, M11, M12, M21, M22. Rows include elements 804-1531 with various force values.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jset, OutputCase, M11, M12, M21, M22. Rows include elements 806-1502 with various force values.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Jset, OutputCase, M11, M12, M21, M22. Rows include elements 807-1576 with various force values.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Joint, Element, OutputCase, M11, M12, M13. Rows include data for joints 800-811 and elements 1551-1577.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Joint, Element, OutputCase, M11, M12, M13. Rows include data for joints 811-812 and elements 1582-1497.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Joint, Element, OutputCase, M11, M12, M13. Rows include data for joints 812-814 and elements 1494-1497.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Joint, Element, OutputCase, M11, M12, M13. Rows include data for joints 814-815 and elements 1498-1530.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Joint, Element, OutputCase, M11, M12, M13. Rows include data for joints 815-816 and elements 1517-1515.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Joint, Element, OutputCase, M11, M12, M13. Rows include data for joints 817-818 and elements 1517-1487.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Joint, Element, OutputCase, M11, M12, M13. Rows include data for joints 818-820 and elements 1490-1537.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Joint, Element, OutputCase, M11, M12, M13. Rows include data for joints 820-821 and elements 1536-1533.

Table 25: Element Forces - Area Shells, Part 2 of 3. Columns: Area, Joint, Element, OutputCase, M11, M12, M13. Rows include data for joints 821-823 and elements 1536-1561.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows include elements 71-72 with various force components like SISMO X, SISMO Y, SISMO Z, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows include elements 72-74 with various force components like SISMO X, SISMO Y, SISMO Z, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows include elements 74-76 with various force components like SISMO X, SISMO Y, SISMO Z, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows include elements 76-77 with various force components like SISMO X, SISMO Y, SISMO Z, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows include elements 77-79 with various force components like SISMO X, SISMO Y, SISMO Z, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows include elements 79-80 with various force components like SISMO X, SISMO Y, SISMO Z, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows include elements 80-82 with various force components like SISMO X, SISMO Y, SISMO Z, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows include elements 82-83 with various force components like SISMO X, SISMO Y, SISMO Z, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows include elements 83-85 with various force components like SISMO X, SISMO Y, SISMO Z, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 85-87 with various element types and values.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 87-90 with various element types and values.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 88-90 with various element types and values.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 90-91 with various element types and values.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 91-92 with various element types and values.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 92-94 with various element types and values.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 94-97 with various element types and values.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 97-98 with various element types and values.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 98-100 with various element types and values.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 100-102.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 102-103.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 103-105.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 105-106.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 106-107.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 107-109.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 109-110.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 110-111.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 111-113.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 114-166.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 116-199.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 117-199.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 119-166.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 120-199.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 122-199.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 131-166.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 134-199.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 138-199.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 145-187.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 148-303.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 473-619.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 475-647.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 476-647.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 478-606.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 480-647.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 482-680.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 484-680.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 485-497.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 487-497.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 488-497.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 492-497.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 493-497.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 495-497.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 497-500.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 498-500.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 500-501.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 501-603.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 603-1178.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 1178-1903.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 1903-3078.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 3078-4243.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 4243-5403.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 5403-6568.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 6568-7733.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 7733-8903.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 515-634.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 517-647.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 518-649.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 520-642.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 522-647.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 523-649.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 525-674.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 526-677.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 528-684.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 529-683.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 531-683.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 533-683.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 534-683.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 536-683.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 537-683.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 539-683.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 540-683.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 542-683.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 543-545.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 546-548.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 549-551.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 548-550.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 551-553.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 554-556.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 553-555.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 556-558.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 559-561.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 558-599.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 559-599.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 561-599.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 562-599.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 564-599.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 565-599.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 567-599.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 568-599.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 570-599.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 572-573.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 573-576.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 575-576.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 576-578.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 578-579.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 579-581.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 581-583.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 583-584.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 584-586.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 586-598.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 597-598.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 599-600.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 599-600.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 599-600.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 599-600.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 599-600.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 599-600.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 599-600.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 614-615 showing force values for various elements and cases.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 616-617 showing force values for various elements and cases.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 618-619 showing force values for various elements and cases.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 619-620 showing force values for various elements and cases.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 620-621 showing force values for various elements and cases.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 621-622 showing force values for various elements and cases.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 622-623 showing force values for various elements and cases.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 623-624 showing force values for various elements and cases.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 624-625 showing force values for various elements and cases.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 628-629.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 629-630.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 631-633.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 633-634.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 634-636.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 636-637.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 637-638.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 638-640.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jc, OutputCase, V13 KN/m, V23 KN/m. Rows 640-642.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 642-643.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 644-645.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 646-647.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 647-648.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 648-649.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 650-651.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 651-652.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 652-653.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 654-655.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jawk, OutputCase, V13 KN/m, V23 KN/m. Rows 656-698.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jawk, OutputCase, V13 KN/m, V23 KN/m. Rows 698-1338.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jawk, OutputCase, V13 KN/m, V23 KN/m. Rows 1338-2000.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jawk, OutputCase, V13 KN/m, V23 KN/m. Rows 661-1376.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jawk, OutputCase, V13 KN/m, V23 KN/m. Rows 662-1376.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jawk, OutputCase, V13 KN/m, V23 KN/m. Rows 664-1376.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jawk, OutputCase, V13 KN/m, V23 KN/m. Rows 665-1291.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jawk, OutputCase, V13 KN/m, V23 KN/m. Rows 667-1291.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jawk, OutputCase, V13 KN/m, V23 KN/m. Rows 668-1291.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcwr, OutputCase, V13 KN/m, V23 KN/m. Rows 670-672.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcwr, OutputCase, V13 KN/m, V23 KN/m. Rows 672-673.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcwr, OutputCase, V13 KN/m, V23 KN/m. Rows 673-674.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcwr, OutputCase, V13 KN/m, V23 KN/m. Rows 675-676.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcwr, OutputCase, V13 KN/m, V23 KN/m. Rows 676-677.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcwr, OutputCase, V13 KN/m, V23 KN/m. Rows 677-678.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcwr, OutputCase, V13 KN/m, V23 KN/m. Rows 679-680.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcwr, OutputCase, V13 KN/m, V23 KN/m. Rows 680-681.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcwr, OutputCase, V13 KN/m, V23 KN/m. Rows 681-682.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 684-965.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 966-1247.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 1248-1529.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 1530-1811.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 1812-2093.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 2094-2375.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 2376-2657.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 2658-2939.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 2940-3221.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 698-700.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 700-702.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 702-704.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 703-704.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 704-706.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 706-708.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 708-710.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 710-712.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 712-714.

| Table 25: Element Forces - Area Shells, Part 3 of 3 | | | | | |
|---|------|---------------|-------------|-------------|--|
| Area | Job# | OutputCase | V13 KN/m | V23 KN/m | |
| 712 | 1429 | -TorsionSISMO | 0. | 0. | |
| 712 | 1428 | -TorsionSISMO | 0. | 0. | |
| 712 | 1320 | -TorsionSISMO | 0. | 0. | |
| 712 | 1321 | -TorsionSISMO | 0. | 0. | |
| 712 | 1429 | -TorsionSISMO | 0. | 0. | |
| 712 | 1428 | -TorsionSISMO | 0. | 0. | |
| 713 | 1322 | DO | 3.254E-04 | 4.902E-04 | |
| 713 | 1323 | DO | 3.254E-04 | -3.015E-04 | |
| 713 | 1431 | DO | -3.108E-04 | -3.015E-04 | |
| 713 | 1430 | DO | -3.108E-04 | 4.902E-04 | |
| 713 | 1322 | DL | 2.385E-04 | 3.958E-04 | |
| 713 | 1323 | DL | 2.385E-04 | -2.020E-04 | |
| 713 | 1431 | DL | -2.366E-04 | -2.020E-04 | |
| 713 | 1430 | DL | -2.366E-04 | 3.958E-04 | |
| 713 | 1322 | LL | 1.943E-04 | 3.415E-04 | |
| 713 | 1323 | LL | 1.943E-04 | -1.526E-04 | |
| 713 | 1431 | LL | -1.981E-04 | -1.526E-04 | |
| 713 | 1430 | LL | -1.981E-04 | 3.415E-04 | |
| 713 | 1322 | SISMO X | 0. | 0. | |
| 713 | 1323 | SISMO X | 0. | 0. | |
| 713 | 1431 | SISMO X | 0. | 0. | |
| 713 | 1430 | SISMO X | 0. | 0. | |
| 713 | 1322 | SISMO Y | 0. | 0. | |
| 713 | 1323 | SISMO Y | 0. | 0. | |
| 713 | 1431 | SISMO Y | 0. | 0. | |
| 713 | 1430 | SISMO Y | 0. | 0. | |
| 713 | 1322 | -TorsionSISMO | 0. | 0. | |
| 713 | 1323 | -TorsionSISMO | 0. | 0. | |
| 713 | 1431 | -TorsionSISMO | 0. | 0. | |
| 713 | 1430 | -TorsionSISMO | 0. | 0. | |
| 713 | 1322 | -TorsionSISMO | 0. | 0. | |
| 713 | 1323 | -TorsionSISMO | 0. | 0. | |
| 714 | 1336 | DO | 2.664E-04 | 4.989E-04 | |
| 714 | 1337 | DO | 2.664E-04 | -2.806E-04 | |
| 714 | 1445 | DO | -2.423E-04 | -2.806E-04 | |
| 714 | 1444 | DO | -2.423E-04 | 4.989E-04 | |
| 714 | 1336 | DL | 1.945E-04 | 3.958E-04 | |
| 714 | 1337 | DL | 1.945E-04 | -2.007E-04 | |
| 714 | 1445 | DL | -1.910E-04 | -2.007E-04 | |
| 714 | 1444 | DL | -1.910E-04 | 3.958E-04 | |
| 714 | 1336 | LL | 1.579E-04 | 3.410E-04 | |

| Table 25: Element Forces - Area Shells, Part 3 of 3 | | | | | |
|---|------|---------------|-------------|-------------|--|
| Area | Job# | OutputCase | V13 KN/m | V23 KN/m | |
| 714 | 1337 | LL | 1.579E-04 | -1.696E-04 | |
| 714 | 1444 | LL | -1.649E-04 | -1.696E-04 | |
| 714 | 1444 | LL | -1.649E-04 | 3.410E-04 | |
| 714 | 1336 | SISMO X | 0. | 0. | |
| 714 | 1445 | SISMO X | 0. | 0. | |
| 714 | 1444 | SISMO X | 0. | 0. | |
| 714 | 1337 | SISMO X | 0. | 0. | |
| 714 | 1444 | SISMO X | 0. | 0. | |
| 714 | 1336 | SISMO Y | 0. | 0. | |
| 714 | 1445 | SISMO Y | 0. | 0. | |
| 714 | 1444 | SISMO Y | 0. | 0. | |
| 714 | 1337 | SISMO Y | 0. | 0. | |
| 714 | 1444 | SISMO Y | 0. | 0. | |
| 714 | 1336 | -TorsionSISMO | 0. | 0. | |
| 714 | 1445 | -TorsionSISMO | 0. | 0. | |
| 714 | 1444 | -TorsionSISMO | 0. | 0. | |
| 714 | 1337 | -TorsionSISMO | 0. | 0. | |
| 715 | 1332 | DO | 5.248E-09 | 7.898E-10 | |
| 715 | 1333 | DO | 5.248E-09 | -1.855E-09 | |
| 715 | 1441 | DO | 4.171E-09 | -1.855E-09 | |
| 715 | 1440 | DO | 4.171E-09 | 7.898E-10 | |
| 715 | 1332 | DL | 3.398E-09 | -8.656E-10 | |
| 715 | 1333 | DL | 3.398E-09 | -4.036E-09 | |
| 715 | 1441 | DL | 2.076E-09 | -4.036E-09 | |
| 715 | 1440 | DL | 2.076E-09 | 8.656E-10 | |
| 715 | 1332 | LL | 2.442E-09 | -1.608E-09 | |
| 715 | 1333 | LL | 2.442E-09 | -4.968E-09 | |
| 715 | 1441 | LL | 1.072E-09 | -4.968E-09 | |
| 715 | 1440 | LL | 1.072E-09 | -1.608E-09 | |
| 715 | 1332 | SISMO X | 0. | 0. | |
| 715 | 1333 | SISMO X | 0. | 0. | |
| 715 | 1441 | SISMO X | 0. | 0. | |
| 715 | 1440 | SISMO X | 0. | 0. | |
| 715 | 1332 | SISMO Y | 0. | 0. | |
| 715 | 1333 | SISMO Y | 0. | 0. | |
| 715 | 1441 | SISMO Y | 0. | 0. | |
| 715 | 1440 | SISMO Y | 0. | 0. | |
| 715 | 1332 | -TorsionSISMO | 0. | 0. | |
| 715 | 1333 | -TorsionSISMO | 0. | 0. | |
| 715 | 1441 | -TorsionSISMO | 0. | 0. | |
| 715 | 1440 | -TorsionSISMO | 0. | 0. | |
| 716 | 1442 | DO | -5.248E-05 | -4.218E-04 | |
| 716 | 1336 | DO | -5.248E-05 | 4.661E-04 | |
| 716 | 1443 | DO | -6.574E-05 | -4.661E-04 | |
| 716 | 1444 | DO | -6.574E-05 | -4.218E-04 | |
| 716 | 1336 | DL | -2.624E-05 | -5.537E-04 | |
| 716 | 1442 | DL | -2.624E-05 | -4.408E-04 | |
| 716 | 1443 | DL | 7.500E-06 | -5.537E-04 | |
| 716 | 1444 | DL | -1.370E-05 | -4.408E-04 | |
| 716 | 1336 | LL | -1.370E-05 | -4.218E-04 | |
| 716 | 1442 | LL | 4.119E-05 | -2.158E-04 | |
| 716 | 1443 | LL | 4.119E-05 | -6.053E-04 | |
| 716 | 1444 | LL | 4.119E-05 | -2.158E-04 | |
| 716 | 1336 | SISMO X | 0. | 0. | |
| 716 | 1442 | SISMO X | 0. | 0. | |

| Table 25: Element Forces - Area Shells, Part 3 of 3 | | | | | |
|---|------|---------------|-------------|-------------|--|
| Area | Job# | OutputCase | V13 KN/m | V23 KN/m | |
| 715 | 1333 | -TorsionSISMO | 0. | 0. | |
| 715 | 1441 | -TorsionSISMO | 0. | 0. | |
| 715 | 1440 | -TorsionSISMO | 0. | 0. | |
| 716 | 1334 | DO | 5.141E-09 | 6.232E-07 | |
| 716 | 1335 | DO | 5.141E-09 | 6.207E-07 | |
| 716 | 1443 | DO | 4.328E-09 | 6.207E-07 | |
| 716 | 1442 | DO | 4.328E-09 | 6.232E-07 | |
| 716 | 1334 | DL | 3.270E-09 | 5.978E-07 | |
| 716 | 1335 | DL | 3.270E-09 | 5.546E-07 | |
| 716 | 1443 | DL | 2.185E-09 | 5.546E-07 | |
| 716 | 1442 | DL | 2.185E-09 | 5.978E-07 | |
| 716 | 1334 | LL | 2.350E-09 | 5.160E-07 | |
| 716 | 1335 | LL | 2.350E-09 | 5.145E-07 | |
| 716 | 1443 | LL | 1.158E-09 | 5.160E-07 | |
| 716 | 1442 | LL | 1.158E-09 | 5.145E-07 | |
| 716 | 1334 | SISMO X | 0. | 0. | |
| 716 | 1335 | SISMO X | 0. | 0. | |
| 716 | 1443 | SISMO X | 0. | 0. | |
| 716 | 1442 | SISMO X | 0. | 0. | |
| 716 | 1334 | SISMO Y | 0. | 0. | |
| 716 | 1335 | SISMO Y | 0. | 0. | |
| 716 | 1443 | SISMO Y | 0. | 0. | |
| 716 | 1442 | SISMO Y | 0. | 0. | |
| 716 | 1334 | -TorsionSISMO | 0. | 0. | |
| 716 | 1335 | -TorsionSISMO | 0. | 0. | |
| 716 | 1443 | -TorsionSISMO | 0. | 0. | |
| 716 | 1442 | -TorsionSISMO | 0. | 0. | |
| 717 | 1336 | DO | -5.248E-05 | -4.218E-04 | |
| 717 | 1322 | DO | -5.248E-05 | 4.661E-04 | |
| 717 | 1430 | DO | -6.574E-05 | -4.661E-04 | |
| 717 | 1444 | DO | -6.574E-05 | -4.218E-04 | |
| 717 | 1336 | DL | -2.624E-05 | -5.537E-04 | |
| 717 | 1430 | DL | -2.624E-05 | -4.408E-04 | |
| 717 | 1444 | DL | 7.500E-06 | -5.537E-04 | |
| 717 | 1322 | DL | -1.370E-05 | -4.408E-04 | |
| 717 | 1430 | LL | -1.370E-05 | -4.218E-04 | |
| 717 | 1444 | LL | 4.119E-05 | -2.158E-04 | |
| 717 | 1336 | SISMO X | 0. | 0. | |
| 717 | 1322 | SISMO X | 0. | 0. | |

| Table 25: Element Forces - Area Shells, Part 3 of 3 | | | | | |
|---|------|---------------|-------------|-------------|--|
| Area | Job# | OutputCase | V13 KN/m | V23 KN/m | |
| 717 | 1430 | SISMO X | 0. | 0. | |
| 717 | 1444 | SISMO X | 0. | 0. | |
| 717 | 1336 | SISMO Y | 0. | 0. | |
| 717 | 1322 | SISMO Y | 0. | 0. | |
| 717 | 1430 | SISMO Y | 0. | 0. | |
| 717 | 1444 | SISMO Y | 0. | 0. | |
| 717 | 1336 | -TorsionSISMO | 0. | 0. | |
| 717 | 1322 | -TorsionSISMO | 0. | 0. | |
| 717 | 1430 | -TorsionSISMO | 0. | 0. | |
| 717 | 1444 | -TorsionSISMO | 0. | 0. | |
| 718 | 1331 | DO | 5.141E-09 | 6.207E-07 | |
| 718 | 1439 | DO | 4.328E-09 | 6.207E-07 | |
| 718 | 1438 | DO | 4.328E-09 | 6.232E-07 | |
| 718 | 1330 | DO | 5.141E-09 | 6.232E-07 | |
| 718 | 1331 | DL | 3.270E-09 | 5.546E-07 | |
| 718 | 1439 | DL | 2.185E-09 | 5.546E-07 | |
| 718 | 1438 | DL | 2.185E-09 | 5.978E-07 | |
| 718 | 1330 | DL | 3.270E-09 | 5.978E-07 | |
| 718 | 1438 | LL | 2.350E-09 | 5.145E-07 | |
| 718 | 1439 | LL | 1.158E-09 | 5.145E-07 | |
| 718 | 1438 | LL | 1.158E-09 | 5.160E-07 | |
| 718 | 1330 | LL | 2.350E-09 | 5.160E-07 | |
| 718 | 1331 | SISMO X | 0. | 0. | |
| 718 | 1439 | SISMO X | 0. | 0. | |
| 718 | 1438 | SISMO X | 0. | 0. | |
| 718 | 1330 | SISMO X | 0. | 0. | |
| 718 | 1331 | SISMO Y | 0. | 0. | |
| 718 | 1439 | SISMO Y | 0. | 0. | |
| 718 | 1438 | SISMO Y | 0. | 0. | |
| 718 | 1330 | SISMO Y | 0. | 0. | |
| 718 | 1331 | -TorsionSISMO | 0. | 0. | |
| 718 | 1439 | -TorsionSISMO | 0. | 0. | |
| 718 | 1438 | -TorsionSISMO | 0. | 0. | |
| 718 | 1330 | -TorsionSISMO | 0. | 0. | |
| 718 | 1331 | -TorsionSISMO | 0. | 0. | |
| 718 | 1439 | -TorsionSISMO | 0. | 0. | |
| 718 | 1438 | -TorsionSISMO | 0. | 0. | |

| Table 25: Element Forces - Area Shells, Part 3 of 3 | | | | | |
|---|------|---------------|-------------|-------------|--|
| Area | Job# | OutputCase | V13 KN/m | V23 KN/m | |
| 718 | 1330 | -TorsionSISMO | 0. | 0. | |
| 719 | 1340 | DO | 2.628E-02 | 0.22 | |
| 719 | 1341 | DO | 2.628E-02 | -6.611E-03 | |
| 719 | 1449 | DO | -2.722E-02 | -6.611E-03 | |
| 719 | 1448 | DO | -2.722E-02 | 0.22 | |
| 719 | 1340 | DL | 1.048E-04 | -9.116E-04 | |
| 719 | 1341 | DL | 1.048E-04 | -1.715E-03 | |
| 719 | 1449 | DL | -8.247E-05 | -1.715E-03 | |
| 719 | 1448 | DL | -8.247E-05 | 9.116E-04 | |
| 719 | 1340 | LL | 8.003E-05 | -8.789E-04 | |
| 719 | 1341 | LL | 8.003E-05 | -1.593E-03 | |
| 719 | 1449 | LL | -9.967E-05 | -1.593E-03 | |
| 719 | 1448 | LL | -9.967E-05 | -8.789E-04 | |
| 719 | 1340 | SISMO X | 0. | 0. | |
| 719 | 1341 | SISMO X | 0. | 0. | |
| 719 | 1449 | SISMO X | 0. | 0. | |
| 719 | 1448 | SISMO X | 0. | 0. | |
| 719 | 1340 | SISMO Y | 0. | 0. | |
| 719 | 1341 | SISMO Y | 0. | 0. | |
| 719 | 1449 | SISMO Y | 0. | 0. | |
| 719 | 1448 | SISMO Y | 0. | 0. | |
| 719 | 1340 | -TorsionSISMO | 0. | 0. | |
| 719 | 1341 | -TorsionSISMO | 0. | 0. | |
| 719 | 1449 | -TorsionSISMO | 0. | 0. | |
| 719 | 1448 | -TorsionSISMO | 0. | 0. | |
| 720 | 1424 | DO | 0. | 0. | |
| 720 | 1419 | DO | 0. | 0. | |
| 720 | 1420 | DO | 0. | 0. | |
| 720 | 1423 | DO | 0. | 0. | |
| 720 | 1424 | DL | 0. | 0. | |
| 720 | 1419 | DL | 0. | 0. | |
| 720 | 1420 | DL | 0. | 0. | |
| 720 | 1423 | DL | 0. | 0. | |
| 720 | 1424 | SISMO X | 0. | 0. | |
| 720 | 1419 | SISMO X | 0. | 0. | |
| 720 | 1420 | SISMO X | 0. | 0. | |
| 720 | 1423 | SISMO X | 0. | 0. | |
| 720 | 1424 | SISMO Y | 0. | 0. | |
| 720 | 1419 | SISMO Y | 0. | 0. | |
| 720 | 1420 | SISMO Y | 0. | 0. | |
| 720 | 1423 | SISMO Y | 0. | 0. | |
| 720 | 1424 | -TorsionSISMO | 0. | 0. | |
| 720 | 1419 | -TorsionSISMO | 0. | 0. | |
| 720 | 1420 | -TorsionSISMO | 0. | 0. | |
| 720 | | | | | |

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 726-730.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 728-730.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 729-731.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 731-733.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 733-734.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 734-736.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 736-737.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 737-739.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jcivk, OutputCase, V13 KN/m, V23 KN/m. Rows 739-740.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 740-742 with various output cases like -TorsionSISO, DO, DL, LL, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 742-743 with various output cases like SISMO X, SISMO Y, SISMO X, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 743-745 with various output cases like -TorsionSISO, DO, DL, LL, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 745-747 with various output cases like SISMO Y, DO, DL, LL, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 747-748 with various output cases like DO, DL, LL, SISMO X, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 748-750 with various output cases like -TorsionSISO, DO, DL, LL, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 750-751 with various output cases like DL, LL, DO, SISMO X, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 751-752 with various output cases like -TorsionSISO, DO, DL, LL, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 752-754 with various output cases like -TorsionSISO, DO, DL, LL, etc.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, JWR, OutputCase, V13 KN/m, V23 KN/m. Rows 754-756 showing force values for various cases and elements.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, JWR, OutputCase, V13 KN/m, V23 KN/m. Rows 756-758 showing force values for various cases and elements.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, JWR, OutputCase, V13 KN/m, V23 KN/m. Rows 758-760 showing force values for various cases and elements.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, JWR, OutputCase, V13 KN/m, V23 KN/m. Rows 759-761 showing force values for various cases and elements.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, JWR, OutputCase, V13 KN/m, V23 KN/m. Rows 761-763 showing force values for various cases and elements.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, JWR, OutputCase, V13 KN/m, V23 KN/m. Rows 763-765 showing force values for various cases and elements.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, JWR, OutputCase, V13 KN/m, V23 KN/m. Rows 764-766 showing force values for various cases and elements.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, JWR, OutputCase, V13 KN/m, V23 KN/m. Rows 766-768 showing force values for various cases and elements.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, JWR, OutputCase, V13 KN/m, V23 KN/m. Rows 768-770 showing force values for various cases and elements.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 783-794.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 794-904.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 904-1014.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 1014-1124.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 1124-1234.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 1234-1344.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 1344-1454.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 1454-1564.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 1564-1674.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 797-798.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 799-800.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 801-802.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 803-804.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 805-806.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 807-808.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 809-810.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 811-812.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 813-814.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 811-812 with various force values and directions.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 812-814 with various force values and directions.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 814-815 with various force values and directions.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 815-817 with various force values and directions.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 817-818 with various force values and directions.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 818-820 with various force values and directions.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 820-822 with various force values and directions.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 822-823 with various force values and directions.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Jciv, OutputCase, V13 KN/m, V23 KN/m. Rows 823-825 with various force values and directions.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Joint, OutputCase, V13 KN/m, V23 KN/m. Rows 825-1587.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Joint, OutputCase, V13 KN/m, V23 KN/m. Rows 826-1587.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Joint, OutputCase, V13 KN/m, V23 KN/m. Rows 828-1587.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Joint, OutputCase, V13 KN/m, V23 KN/m. Rows 829-1587.

Table 25: Element Forces - Area Shells, Part 3 of 3. Columns: Area, Joint, OutputCase, V13 KN/m, V23 KN/m. Rows 831-1587.

Table 26: Element Stresses - Area Shells, Part 1 of 3

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top KN/m2, S22Top KN/m2, S12Top KN/m2. Rows 67-828.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top KN/m2, S22Top KN/m2, S12Top KN/m2. Rows 68-828.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top KN/m2, S22Top KN/m2, S12Top KN/m2. Rows 70-828.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top KN/m2, S22Top KN/m2, S12Top KN/m2. Rows 71-828.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for elements 73, 74, 75, 76, 77, 78, 79.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for elements 74, 75, 76, 77, 78, 79.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for elements 76, 77, 78, 79.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for elements 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for elements 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for elements 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for elements 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for elements 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for elements 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include element data for Area 87, 88, 89, 90, 91, 92, 93, 94, 95.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include element data for Area 88, 89, 90, 91, 92, 93, 94, 95.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include element data for Area 90, 91, 92, 93, 94, 95.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include element data for Area 91, 92, 93, 94, 95.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include element data for Area 93, 94, 95.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include element data for Area 95, 96, 97, 98, 99, 100, 101, 102.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include element data for Area 97, 98, 99, 100, 101, 102.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include element data for Area 99, 100, 101, 102.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include element data for Area 100, 101, 102.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows 102-103.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows 103-104.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows 105-106.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows 107-108.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows 108-109.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows 110-111.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows 111-112.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows 112-113.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows 114-115.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 116-117 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 117-118 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 119-120 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 121-122 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 122-133 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 133-134 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 134-135 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 138-145 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 145-148 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 148, 149, 150, etc.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 473, 474, 475, etc.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 475, 476, 477, etc.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 477, 478, 479, etc.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 478, 479, 480, etc.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 480, 481, 482, etc.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 482, 483, 484, etc.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 484, 485, 486, etc.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 485, 486, 487, etc.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 503-504 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 505-506 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 506-507 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 508-509 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 510-511 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 511-512 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 512-514 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 514-515 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 515-517 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 517-519 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 519-520 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 520-522 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 522-523 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 523-524 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 525-526 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 526-528 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 528-530 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 530-531 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 531-533 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 533-536 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 534-536 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 536-537 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 537-538 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 538-541 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 541-542 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 542-543 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 544-545 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 545-548 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 547-548 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 548-550 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 550-551 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 551-553 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 553-555 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 555-556 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 556-558 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 558-559 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 559-561 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 561-562 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 562-564 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 564-566 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 566-568 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 568-570 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 570-572 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 572-574 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 574-576 with various stress values.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and joints.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 567-589.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 590-911.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 912-992.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 993-1185.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 1186-1595.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 1596-1811.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 1812-2220.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 2221-3000.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 3001-3300.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 601-603 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 603-605 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 605-606 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 606-608 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 608-609 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 609-610 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 611-612 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 612-614 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 614-616 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 616-617 with stress values for various cases like DO, DL, LL, and SISMO X/Y.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 617-618 with stress values for various cases like DO, DL, LL, and SISMO X/Y.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 619-620 with stress values for various cases like DO, DL, LL, and SISMO X/Y.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 620-621 with stress values for various cases like DO, DL, LL, and SISMO X/Y.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 622-623 with stress values for various cases like DO, DL, LL, and SISMO X/Y.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 624-625 with stress values for various cases like DO, DL, LL, and SISMO X/Y.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 626-627 with stress values for various cases like DO, DL, LL, and SISMO X/Y.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 628-629 with stress values for various cases like DO, DL, LL, and SISMO X/Y.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 630-631 with stress values for various cases like DO, DL, LL, and SISMO X/Y.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include data for areas 630-631 and 633-634.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include data for areas 631-633 and 634-636.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include data for areas 633-634 and 636-638.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include data for areas 634-636 and 638-640.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include data for areas 636-638 and 640-642.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include data for areas 637-639 and 641-643.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include data for areas 639-641 and 643-645.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include data for areas 641-643 and 645-647.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include data for areas 642-644 and 646-648.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot.

Table 26. Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Output/Case, S11Top, S11Bot, S11Top, S11Bot. Rows include elements 658-669 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Output/Case, S11Top, S11Bot, S11Top, S11Bot. Rows include elements 659-690 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Output/Case, S11Top, S11Bot, S11Top, S11Bot. Rows include elements 661-690 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Output/Case, S11Top, S11Bot, S11Top, S11Bot. Rows include elements 662-690 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Output/Case, S11Top, S11Bot, S11Top, S11Bot. Rows include elements 664-690 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Output/Case, S11Top, S11Bot, S11Top, S11Bot. Rows include elements 666-690 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Output/Case, S11Top, S11Bot, S11Top, S11Bot. Rows include elements 667-690 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Output/Case, S11Top, S11Bot, S11Top, S11Bot. Rows include elements 669-690 with various stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Output/Case, S11Top, S11Bot, S11Top, S11Bot. Rows include elements 670-690 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 672-673 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 673-675 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 675-676 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 676-677 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 678-679 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 680-681 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 681-682 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 683-684 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 684-686 with various stress values.

Table 26: Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 686-696 with various stress values.

Table 26: Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 687-696 with various stress values.

Table 26: Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 689-691 with various stress values.

Table 26: Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 691-696 with various stress values.

Table 26: Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 692-696 with various stress values.

Table 26: Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 694-696 with various stress values.

Table 26: Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 695-700 with various stress values.

Table 26: Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 697-700 with various stress values.

Table 26: Element Stresses - Area Sheils, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include elements 698-700 with various stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Table with columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Contains stress analysis data for elements 700-714.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Table with columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Contains stress analysis data for elements 701-714.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Table with columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Contains stress analysis data for elements 703-704.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Table with columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Contains stress analysis data for elements 705-714.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Table with columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Contains stress analysis data for elements 706-707.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Table with columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Contains stress analysis data for elements 708-709.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Table with columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Contains stress analysis data for elements 709-710.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Table with columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Contains stress analysis data for elements 711-712.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Table with columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Contains stress analysis data for elements 712-714.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows include various element IDs and stress values.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1YTop, S1ZTop. Rows 728-730.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1YTop, S1ZTop. Rows 730-731.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1YTop, S1ZTop. Rows 731-733.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1YTop, S1ZTop. Rows 733-734.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1YTop, S1ZTop. Rows 734-735.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1YTop, S1ZTop. Rows 735-737.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1YTop, S1ZTop. Rows 737-740.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1YTop, S1ZTop. Rows 740-741.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1YTop, S1ZTop. Rows 741-742.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 1 of 3, S11Top, S11Bot, S11Knm2.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 1 of 3, S11Top, S11Bot, S11Knm2.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 1 of 3, S11Top, S11Bot, S11Knm2.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 1 of 3, S11Top, S11Bot, S11Knm2.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 1 of 3, S11Top, S11Bot, S11Knm2.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 1 of 3, S11Top, S11Bot, S11Knm2.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 1 of 3, S11Top, S11Bot, S11Knm2.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 1 of 3, S11Top, S11Bot, S11Knm2.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 1 of 3, S11Top, S11Bot, S11Knm2.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and cases.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and cases.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and cases.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and cases.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and cases.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and cases.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and cases.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and cases.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Top, S11Bot, S12Top, S12Bot. Rows include stress data for various elements and cases.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 770-772 showing stress values for various elements and cases.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 772-773 showing stress values for various elements and cases.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 773-775 showing stress values for various elements and cases.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 775-777 showing stress values for various elements and cases.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 777-779 showing stress values for various elements and cases.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 779-782 showing stress values for various elements and cases.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 780-781 showing stress values for various elements and cases.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 781-783 showing stress values for various elements and cases.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows 783-784 showing stress values for various elements and cases.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 784-795.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 786-795.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 787-795.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 789-795.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 791-795.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 792-795.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 794-795.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 795-795.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 797-795.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, ST1Top, ST2Top, ST1Bot, ST2Bot.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, ST1Top, ST2Top, ST1Bot, ST2Bot.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, ST1Top, ST2Top, ST1Bot, ST2Bot.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, ST1Top, ST2Top, ST1Bot, ST2Bot.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, ST1Top, ST2Top, ST1Bot, ST2Bot.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, ST1Top, ST2Top, ST1Bot, ST2Bot.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, ST1Top, ST2Top, ST1Bot, ST2Bot.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, ST1Top, ST2Top, ST1Bot, ST2Bot.

Table 26. Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, ST1Top, ST2Top, ST1Bot, ST2Bot.

Table with 11 columns: Area, AreaElem, Element, Joint, Output/Case, STYTop, STYBot, STYTop, STYBot. Rows include elements 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840.

Table with 11 columns: Area, AreaElem, Element, Joint, Output/Case, STYTop, STYBot, STYTop, STYBot. Rows include elements 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840.

Table with 11 columns: Area, AreaElem, Element, Joint, Output/Case, STYTop, STYBot, STYTop, STYBot. Rows include elements 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840.

Table with 11 columns: Area, AreaElem, Element, Joint, Output/Case, STYTop, STYBot, STYTop, STYBot. Rows include elements 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840.

Table with 11 columns: Area, AreaElem, Element, Joint, Output/Case, STYTop, STYBot, STYTop, STYBot. Rows include elements 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840.

Table with 11 columns: Area, AreaElem, Element, Joint, Output/Case, STYTop, STYBot, STYTop, STYBot. Rows include elements 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840.

Table with 11 columns: Area, AreaElem, Element, Joint, Output/Case, STYTop, STYBot, STYTop, STYBot. Rows include elements 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840.

Table with 11 columns: Area, AreaElem, Element, Joint, Output/Case, STYTop, STYBot, STYTop, STYBot. Rows include elements 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840.

Table with 11 columns: Area, AreaElem, Element, Joint, Output/Case, STYTop, STYBot, STYTop, STYBot. Rows include elements 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 826-928.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 828-928.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 830-928.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Top, S11Bot, S12Top, S12Bot. Rows: 831-928.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S12Bot, S13Bot. Rows: 67-67.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S12Bot, S13Bot. Rows: 68-68.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S12Bot, S13Bot. Rows: 70-70.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S12Bot, S13Bot. Rows: 71-71.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S12Bot, S13Bot. Rows: 73-73.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KN/m2, S11Top, S11Top KN/m2. Rows 88-90.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KN/m2, S11Top, S11Top KN/m2. Rows 90-91.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KN/m2, S11Top, S11Top KN/m2. Rows 91-93.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KN/m2, S11Top, S11Top KN/m2. Rows 93-95.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KN/m2, S11Top, S11Top KN/m2. Rows 95-97.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KN/m2, S11Top, S11Top KN/m2. Rows 97-99.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KN/m2, S11Top, S11Top KN/m2. Rows 99-100.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KN/m2, S11Top, S11Top KN/m2. Rows 100-101.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KN/m2, S11Top, S11Top KN/m2. Rows 101-103.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Elem, OutputCase, S1Stress, S2Stress, S3Stress.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 2 of 3, S11tor, S22tor, S33tor.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 2 of 3, S11tor, S22tor, S33tor.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 2 of 3, S11tor, S22tor, S33tor.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 2 of 3, S11tor, S22tor, S33tor.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 2 of 3, S11tor, S22tor, S33tor.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 2 of 3, S11tor, S22tor, S33tor.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 2 of 3, S11tor, S22tor, S33tor.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 2 of 3, S11tor, S22tor, S33tor.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, Part 2 of 3, S11tor, S22tor, S33tor.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 489-499, 492-502, 495-496.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 492-499, 495-496, 499-509.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 494-499, 495-496, 499-509.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 495-496, 499-509, 492-499.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 497-499, 495-496, 499-509.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 498-499, 495-496, 499-509.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 500-502, 505-506, 501-509.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 502-506, 501-509, 503-509.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 503-506, 501-509, 503-509.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1Stress, S2Stress, S3Stress. Rows include elements 519-520 and 521-522.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1Stress, S2Stress, S3Stress. Rows include elements 520-521 and 522-523.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1Stress, S2Stress, S3Stress. Rows include elements 522-523 and 523-524.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1Stress, S2Stress, S3Stress. Rows include elements 523-524 and 524-525.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1Stress, S2Stress, S3Stress. Rows include elements 525-526 and 526-527.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1Stress, S2Stress, S3Stress. Rows include elements 527-528 and 528-529.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1Stress, S2Stress, S3Stress. Rows include elements 528-529 and 529-530.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1Stress, S2Stress, S3Stress. Rows include elements 530-531 and 531-532.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1Stress, S2Stress, S3Stress. Rows include elements 532-533 and 533-534.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include various element IDs and stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 547-548.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 548-550.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 550-552.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 552-553.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 553-554.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 555-556.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 556-557.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 558-559.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 559-561.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 561-662.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 562-662.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 564-662.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 566-662.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 567-662.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 568-662.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 570-662.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 572-662.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Output/Case, S1/Bolt KNm/2, S2/Bolt KNm/2, S1/Bolt KNm/2. Rows: 573-662.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot. Rows include elements 575-577 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot. Rows include elements 577-578 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot. Rows include elements 578-580 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot. Rows include elements 580-581 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot. Rows include elements 581-582 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot. Rows include elements 582-584 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot. Rows include elements 584-586 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot. Rows include elements 586-588 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot. Rows include elements 588-590 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows include elements 589-600 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows include elements 591-700 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows include elements 592-700 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows include elements 594-700 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows include elements 595-700 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows include elements 596-700 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows include elements 598-700 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows include elements 600-700 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows include elements 602-700 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, S1Bolt, S1Bolt. Rows include elements 603-605 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, S1Bolt, S1Bolt. Rows include elements 605-608 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, S1Bolt, S1Bolt. Rows include elements 606-608 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, S1Bolt, S1Bolt. Rows include elements 608-609 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, S1Bolt, S1Bolt. Rows include elements 609-611 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, S1Bolt, S1Bolt. Rows include elements 611-612 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, S1Bolt, S1Bolt. Rows include elements 612-614 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, S1Bolt, S1Bolt. Rows include elements 614-616 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Stress, Area Shells, S1Bolt, S1Bolt. Rows include elements 616-617 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot KNm/2, S11Bot KNm/2. Rows include elements 617-619 and 618-622.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot KNm/2, S11Bot KNm/2. Rows include elements 619-620 and 620-622.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot KNm/2, S11Bot KNm/2. Rows include elements 620-621 and 621-622.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot KNm/2, S11Bot KNm/2. Rows include elements 622-623 and 623-624.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot KNm/2, S11Bot KNm/2. Rows include elements 623-624 and 624-625.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot KNm/2, S11Bot KNm/2. Rows include elements 625-626 and 626-627.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot KNm/2, S11Bot KNm/2. Rows include elements 627-628 and 628-629.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot KNm/2, S11Bot KNm/2. Rows include elements 628-629 and 629-630.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Element, Joint, Output/Case, S11Bot, S11Bot KNm/2, S11Bot KNm/2. Rows include elements 630-631 and 631-632.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Element, S11Bot, S11Top, S22Bot, S22Top, S33Bot, S33Top. Rows include elements 631-632 with stress values.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Element, S11Bot, S11Top, S22Bot, S22Top, S33Bot, S33Top. Rows include elements 633-634 with stress values.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Element, S11Bot, S11Top, S22Bot, S22Top, S33Bot, S33Top. Rows include elements 634-636 with stress values.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Element, S11Bot, S11Top, S22Bot, S22Top, S33Bot, S33Top. Rows include elements 636-637 with stress values.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Element, S11Bot, S11Top, S22Bot, S22Top, S33Bot, S33Top. Rows include elements 637-639 with stress values.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Element, S11Bot, S11Top, S22Bot, S22Top, S33Bot, S33Top. Rows include elements 639-641 with stress values.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Element, S11Bot, S11Top, S22Bot, S22Top, S33Bot, S33Top. Rows include elements 641-642 with stress values.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Element, S11Bot, S11Top, S22Bot, S22Top, S33Bot, S33Top. Rows include elements 642-644 with stress values.

Table 26: Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Element, S11Bot, S11Top, S22Bot, S22Top, S33Bot, S33Top. Rows include elements 644-645 with stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 645-647.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 647-649.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 649-651.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 651-653.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 653-655.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 655-657.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 657-659.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 659-661.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 661-663.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows include stress data for various elements and joints.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot, S11Bot, S11Bot, S11Bot.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 687-699.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 699-914.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 691-914.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 692-914.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 694-914.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 695-914.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 697-914.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 698-914.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows: 700-914.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include elements 702-703 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include elements 703-704 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include elements 705-706 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include elements 706-707 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include elements 708-709 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include elements 709-711 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include elements 711-712 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include elements 712-714 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Bot KNm/m2, S11Bot KNm/m2. Rows include elements 714-716 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3

Table 26. Element Stresses - Area Shells, Part 2 of 3

Table 26. Element Stresses - Area Shells, Part 2 of 3

Table 26. Element Stresses - Area Shells, Part 2 of 3

Table 26. Element Stresses - Area Shells, Part 2 of 3

Table 26. Element Stresses - Area Shells, Part 2 of 3

Table 26. Element Stresses - Area Shells, Part 2 of 3

Table 26. Element Stresses - Area Shells, Part 2 of 3

Table 26. Element Stresses - Area Shells, Part 2 of 3

Table 26. Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt, S2/Bolt, S1/Bolt, S2/Bolt.

Table 26. Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt, S2/Bolt, S1/Bolt, S2/Bolt.

Table 26. Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt, S2/Bolt, S1/Bolt, S2/Bolt.

Table 26. Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt, S2/Bolt, S1/Bolt, S2/Bolt.

Table 26. Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt, S2/Bolt, S1/Bolt, S2/Bolt.

Table 26. Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt, S2/Bolt, S1/Bolt, S2/Bolt.

Table 26. Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt, S2/Bolt, S1/Bolt, S2/Bolt.

Table 26. Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt, S2/Bolt, S1/Bolt, S2/Bolt.

Table 26. Element Stresses - Area Sheils, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt, S2/Bolt, S1/Bolt, S2/Bolt.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 744-748.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 745-749.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 747-752.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 748-750.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 750-752.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 752-753.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 753-755.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 755-756.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S11Bot, S11Top, S11Bot, S11Top. Rows 756-757.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 758-759 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 759-760 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 761-762 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 762-763 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 764-765 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 766-767 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 767-768 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 769-770 with various stress values.

Table 26: Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 770-771 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 772-773 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 773-774 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 775-777 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 777-778 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 778-779 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 780-781 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 781-783 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 783-784 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, OutputCase, S1Stress, S2Stress, S3Stress. Rows include elements 784-786 with various stress values.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows 786-787.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows 787-799.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows 799-800.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows 791-792.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows 792-794.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows 794-795.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows 795-797.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows 797-798.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, Element, Output/Case, S1/Bolt KN/m2, S2/Bolt KN/m2, S1/Bolt KN/m2. Rows 798-800.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, S1Stress, S2Stress, S3Stress, S4Stress, S5Stress, S6Stress. Rows: 800 800 1442, 800 800 1443, 800 800 1551, etc.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, S1Stress, S2Stress, S3Stress, S4Stress, S5Stress, S6Stress. Rows: 802 802 1547, 802 802 1548, 802 802 1549, etc.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, S1Stress, S2Stress, S3Stress, S4Stress, S5Stress, S6Stress. Rows: 803 803 1448, 803 803 1449, 803 803 1557, etc.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, S1Stress, S2Stress, S3Stress, S4Stress, S5Stress, S6Stress. Rows: 805 805 1505, 805 805 1506, 805 805 1507, etc.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, S1Stress, S2Stress, S3Stress, S4Stress, S5Stress, S6Stress. Rows: 806 806 1500, 806 806 1501, 806 806 1502, etc.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, S1Stress, S2Stress, S3Stress, S4Stress, S5Stress, S6Stress. Rows: 808 808 1568, 808 808 1569, 808 808 1570, etc.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, S1Stress, S2Stress, S3Stress, S4Stress, S5Stress, S6Stress. Rows: 809 809 1547, 809 809 1548, 809 809 1549, etc.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, S1Stress, S2Stress, S3Stress, S4Stress, S5Stress, S6Stress. Rows: 811 811 1548, 811 811 1549, 811 811 1550, etc.

Table 26. Element Stresses - Area Shells, Part 2 of 3. Columns: Area, AreaElem, Joint, S1Stress, S2Stress, S3Stress, S4Stress, S5Stress, S6Stress. Rows: 812 812 1497, 812 812 1583, 812 812 1584, etc.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Bot, S11Top, S11Bot, S11Top.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Bot, S11Top, S11Bot, S11Top.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Bot, S11Top, S11Bot, S11Top.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Avg, S21Avg.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Avg, S21Avg.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Avg, S21Avg.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Avg, S21Avg.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Avg, S21Avg.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, S11Avg, S21Avg.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, STZAng. Rows 76-77.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, STZAng. Rows 78-79.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, STZAng. Rows 79-81.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, STZAng. Rows 81-82.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, STZAng. Rows 82-84.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, STZAng. Rows 84-85.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, STZAng. Rows 85-87.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, STZAng. Rows 87-88.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, STZAng. Rows 88-90.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AestDim, Joint, OutputCase, STXAng, STZAng. Rows 105-107.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AestDim, Joint, OutputCase, STXAng, STZAng. Rows 107-108.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AestDim, Joint, OutputCase, STXAng, STZAng. Rows 108-110.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AestDim, Joint, OutputCase, STXAng, STZAng. Rows 110-111.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AestDim, Joint, OutputCase, STXAng, STZAng. Rows 111-112.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AestDim, Joint, OutputCase, STXAng, STZAng. Rows 112-114.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AestDim, Joint, OutputCase, STXAng, STZAng. Rows 114-116.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AestDim, Joint, OutputCase, STXAng, STZAng. Rows 116-118.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AestDim, Joint, OutputCase, STXAng, STZAng. Rows 118-119.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows 475-477.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows 477-478.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows 478-480.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows 480-482.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows 482-484.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows 484-486.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows 486-488.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows 488-490.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows 490-492.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZXAng. Rows 492-494.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZXAng. Rows 494-496.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZXAng. Rows 496-500.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZXAng. Rows 497-500.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZXAng. Rows 499-503.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZXAng. Rows 500-502.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZXAng. Rows 502-503.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZXAng. Rows 503-505.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZXAng. Rows 505-506.

Table with 7 columns: Area, AesIdem, Element, Joint, OutputCase, STXang, SZTang. Contains stress analysis data for elements 506-508.

Table with 7 columns: Area, AesIdem, Element, Joint, OutputCase, STXang, SZTang. Contains stress analysis data for elements 509-511.

Table with 7 columns: Area, AesIdem, Element, Joint, OutputCase, STXang, SZTang. Contains stress analysis data for elements 512-514.

Table with 7 columns: Area, AesIdem, Element, Joint, OutputCase, STXang, SZTang. Contains stress analysis data for elements 515-517.

Table with 7 columns: Area, AesIdem, Element, Joint, OutputCase, STXang, SZTang. Contains stress analysis data for elements 518-520.

Table with 7 columns: Area, AesIdem, Element, Joint, OutputCase, STXang, SZTang. Contains stress analysis data for elements 521-523.

Table with 7 columns: Area, AesIdem, Element, Joint, OutputCase, STXang, SZTang. Contains stress analysis data for elements 524-526.

Table with 7 columns: Area, AesIdem, Element, Joint, OutputCase, STXang, SZTang. Contains stress analysis data for elements 527-529.

Table with 7 columns: Area, AesIdem, Element, Joint, OutputCase, STXang, SZTang. Contains stress analysis data for elements 530-532.

Table with 5 columns: Area, AesID, Element, Stress, Area Shells, Part 3 of 3. Contains stress analysis data for various elements and areas.

Table with 5 columns: Area, AesID, Element, Stress, Area Shells, Part 3 of 3. Contains stress analysis data for various elements and areas.

Table with 5 columns: Area, AesID, Element, Stress, Area Shells, Part 3 of 3. Contains stress analysis data for various elements and areas.

Table with 5 columns: Area, AesID, Element, Stress, Area Shells, Part 3 of 3. Contains stress analysis data for various elements and areas.

Table with 5 columns: Area, AesID, Element, Stress, Area Shells, Part 3 of 3. Contains stress analysis data for various elements and areas.

Table with 5 columns: Area, AesID, Element, Stress, Area Shells, Part 3 of 3. Contains stress analysis data for various elements and areas.

Table with 5 columns: Area, AesID, Element, Stress, Area Shells, Part 3 of 3. Contains stress analysis data for various elements and areas.

Table with 5 columns: Area, AesID, Element, Stress, Area Shells, Part 3 of 3. Contains stress analysis data for various elements and areas.

Table with 5 columns: Area, AesID, Element, Stress, Area Shells, Part 3 of 3. Contains stress analysis data for various elements and areas.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AestBent, Joint, OutputCase, STRESS KNI/m2, STRESS KNI/m2. Rows 534-696.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AestBent, Joint, OutputCase, STRESS KNI/m2, STRESS KNI/m2. Rows 536-696.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AestBent, Joint, OutputCase, STRESS KNI/m2, STRESS KNI/m2. Rows 538-696.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AestBent, Joint, OutputCase, STRESS KNI/m2, STRESS KNI/m2. Rows 539-696.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AestBent, Joint, OutputCase, STRESS KNI/m2, STRESS KNI/m2. Rows 541-696.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AestBent, Joint, OutputCase, STRESS KNI/m2, STRESS KNI/m2. Rows 542-696.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AestBent, Joint, OutputCase, STRESS KNI/m2, STRESS KNI/m2. Rows 544-696.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AestBent, Joint, OutputCase, STRESS KNI/m2, STRESS KNI/m2. Rows 545-696.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AestBent, Joint, OutputCase, STRESS KNI/m2, STRESS KNI/m2. Rows 547-696.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng, SZAAng, KN/m2. Rows 549-666.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng, SZAAng, KN/m2. Rows 667-834.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng, SZAAng, KN/m2. Rows 835-998.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng, SZAAng, KN/m2. Rows 999-1166.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng, SZAAng, KN/m2. Rows 1167-1334.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng, SZAAng, KN/m2. Rows 1335-1502.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng, SZAAng, KN/m2. Rows 1503-1670.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng, SZAAng, KN/m2. Rows 1671-1838.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng, SZAAng, KN/m2. Rows 1839-1998.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows: 563-564.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows: 564-565.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows: 566-567.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows: 567-568.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows: 569-570.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows: 571-572.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows: 572-573.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows: 574-575.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZ2Avg. Rows: 576-577.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXAng, SZAng. Rows 577-578.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXAng, SZAng. Rows 578-580.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXAng, SZAng. Rows 580-581.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXAng, SZAng. Rows 581-583.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXAng, SZAng. Rows 583-584.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXAng, SZAng. Rows 584-586.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXAng, SZAng. Rows 586-588.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXAng, SZAng. Rows 588-589.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXAng, SZAng. Rows 589-591.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows include elements 591-599 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows include elements 592-600 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows include elements 594-600 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows include elements 595-600 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows include elements 597-600 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows include elements 599-600 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows include elements 600-601 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows include elements 602-603 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows include elements 603-605 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows 605-606.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows 606-607.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows 608-609.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows 609-610.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows 611-612.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows 613-614.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows 614-615.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows 616-617.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STXang, STZang. Rows 617-618.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXang, STZang.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXang, STZang.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXang, STZang.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXang, STZang.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXang, STZang.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXang, STZang.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXang, STZang.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXang, STZang.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STXang, STZang.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STAng, SZAng, KN/m2. Rows 633-634.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STAng, SZAng, KN/m2. Rows 634-636.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STAng, SZAng, KN/m2. Rows 636-638.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STAng, SZAng, KN/m2. Rows 638-639.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STAng, SZAng, KN/m2. Rows 639-640.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STAng, SZAng, KN/m2. Rows 640-642.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STAng, SZAng, KN/m2. Rows 642-644.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STAng, SZAng, KN/m2. Rows 644-645.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STAng, SZAng, KN/m2. Rows 645-647.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Joint, OutputCase, STIAng, SZ2Ang. Rows: 647-649.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Joint, OutputCase, STIAng, SZ2Ang. Rows: 648-650.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Joint, OutputCase, STIAng, SZ2Ang. Rows: 650-652.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Joint, OutputCase, STIAng, SZ2Ang. Rows: 652-654.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Joint, OutputCase, STIAng, SZ2Ang. Rows: 654-656.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Joint, OutputCase, STIAng, SZ2Ang. Rows: 656-658.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Joint, OutputCase, STIAng, SZ2Ang. Rows: 658-660.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Joint, OutputCase, STIAng, SZ2Ang. Rows: 660-662.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Joint, OutputCase, STIAng, SZ2Ang. Rows: 662-664.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STSMax, STSMin. Rows 661-663.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STSMax, STSMin. Rows 663-665.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STSMax, STSMin. Rows 664-666.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STSMax, STSMin. Rows 666-668.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STSMax, STSMin. Rows 667-669.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STSMax, STSMin. Rows 669-671.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STSMax, STSMin. Rows 670-672.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STSMax, STSMin. Rows 672-674.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STSMax, STSMin. Rows 674-676.

Table with 6 columns: Area, Arealblm, Element, Stresses - Area Shells, Part 3 of 3, ST3Ang, ST3Ang. Rows include data for elements 675 to 677 across various stress categories like Torsion-SISSMO and SISMO X.

Table with 6 columns: Area, Arealblm, Element, Stresses - Area Shells, Part 3 of 3, ST3Ang, ST3Ang. Rows include data for elements 677 to 678 across various stress categories like Torsion-SISSMO and SISMO X.

Table with 6 columns: Area, Arealblm, Element, Stresses - Area Shells, Part 3 of 3, ST3Ang, ST3Ang. Rows include data for elements 678 to 680 across various stress categories like Torsion-SISSMO and SISMO X.

Table with 6 columns: Area, Arealblm, Element, Stresses - Area Shells, Part 3 of 3, ST3Ang, ST3Ang. Rows include data for elements 680 to 681 across various stress categories like Torsion-SISSMO and SISMO X.

Table with 6 columns: Area, Arealblm, Element, Stresses - Area Shells, Part 3 of 3, ST3Ang, ST3Ang. Rows include data for elements 681 to 683 across various stress categories like Torsion-SISSMO and SISMO X.

Table with 6 columns: Area, Arealblm, Element, Stresses - Area Shells, Part 3 of 3, ST3Ang, ST3Ang. Rows include data for elements 683 to 684 across various stress categories like Torsion-SISSMO and SISMO X.

Table with 6 columns: Area, Arealblm, Element, Stresses - Area Shells, Part 3 of 3, ST3Ang, ST3Ang. Rows include data for elements 684 to 686 across various stress categories like Torsion-SISSMO and SISMO X.

Table with 6 columns: Area, Arealblm, Element, Stresses - Area Shells, Part 3 of 3, ST3Ang, ST3Ang. Rows include data for elements 686 to 688 across various stress categories like Torsion-SISSMO and SISMO X.

Table with 6 columns: Area, Arealblm, Element, Stresses - Area Shells, Part 3 of 3, ST3Ang, ST3Ang. Rows include data for elements 688 to 689 across various stress categories like Torsion-SISSMO and SISMO X.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STSang, STZang. Rows include elements 689-699 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STSang, STZang. Rows include elements 691-701 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STSang, STZang. Rows include elements 692-702 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STSang, STZang. Rows include elements 694-704 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STSang, STZang. Rows include elements 695-705 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STSang, STZang. Rows include elements 697-707 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STSang, STZang. Rows include elements 699-709 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STSang, STZang. Rows include elements 700-710 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AesID, Element, Joint, OutputCase, STSang, STZang. Rows include elements 702-712 with various stress values.

Table with 5 columns: Area, AesIdem, Joint, OutputCase, STSang, STZang. Rows 703-704 showing stress analysis results for various joints and output cases.

Table with 5 columns: Area, AesIdem, Joint, OutputCase, STSang, STZang. Rows 705-706 showing stress analysis results for various joints and output cases.

Table with 5 columns: Area, AesIdem, Joint, OutputCase, STSang, STZang. Rows 707-708 showing stress analysis results for various joints and output cases.

Table with 5 columns: Area, AesIdem, Joint, OutputCase, STSang, STZang. Rows 709-710 showing stress analysis results for various joints and output cases.

Table with 5 columns: Area, AesIdem, Joint, OutputCase, STSang, STZang. Rows 711-712 showing stress analysis results for various joints and output cases.

Table with 5 columns: Area, AesIdem, Joint, OutputCase, STSang, STZang. Rows 713-714 showing stress analysis results for various joints and output cases.

Table with 5 columns: Area, AesIdem, Joint, OutputCase, STSang, STZang. Rows 715-716 showing stress analysis results for various joints and output cases.

Table with 5 columns: Area, AesIdem, Joint, OutputCase, STSang, STZang. Rows 717-718 showing stress analysis results for various joints and output cases.

Table with 5 columns: Area, AesIdem, Joint, OutputCase, STSang, STZang. Rows 719-720 showing stress analysis results for various joints and output cases.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAvg, S2ZAvg, KN/m2. Rows include elements 717-719 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAvg, S2ZAvg, KN/m2. Rows include elements 719-720 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAvg, S2ZAvg, KN/m2. Rows include elements 720-722 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAvg, S2ZAvg, KN/m2. Rows include elements 722-723 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAvg, S2ZAvg, KN/m2. Rows include elements 724-725 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAvg, S2ZAvg, KN/m2. Rows include elements 725-727 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAvg, S2ZAvg, KN/m2. Rows include elements 727-728 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAvg, S2ZAvg, KN/m2. Rows include elements 728-729 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAvg, S2ZAvg, KN/m2. Rows include elements 730-731 with various stress values.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng (KN/m2), S2ZAng (KN/m2). Rows 731-733 with various stress values and output cases like -Torsion/SISMO Y, DO, DL, LL, etc.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng (KN/m2), S2ZAng (KN/m2). Rows 733-734 with various stress values and output cases like SISMO X, SISMO Y, DO, DL, LL, etc.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng (KN/m2), S2ZAng (KN/m2). Rows 734-736 with various stress values and output cases like -Torsion/SISMO Y, DO, DL, LL, etc.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng (KN/m2), S2ZAng (KN/m2). Rows 736-738 with various stress values and output cases like SISMO Y, DO, DL, LL, etc.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng (KN/m2), S2ZAng (KN/m2). Rows 738-739 with various stress values and output cases like DO, DL, LL, etc.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng (KN/m2), S2ZAng (KN/m2). Rows 739-741 with various stress values and output cases like -Torsion/SISMO Y, DO, DL, LL, etc.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng (KN/m2), S2ZAng (KN/m2). Rows 741-742 with various stress values and output cases like DL, LL, etc.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng (KN/m2), S2ZAng (KN/m2). Rows 742-743 with various stress values and output cases like -Torsion/SISMO Y, DO, DL, LL, etc.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STIAng (KN/m2), S2ZAng (KN/m2). Rows 744-745 with various stress values and output cases like LL, DO, DL, LL, etc.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZAng. Rows 745-747.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZAng. Rows 747-749.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZAng. Rows 749-750.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZAng. Rows 750-752.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZAng. Rows 752-753.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZAng. Rows 753-755.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZAng. Rows 755-756.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZAng. Rows 756-757.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AreaElem, Joint, OutputCase, STXAng, SZAng. Rows 757-759.

Table with 6 columns: Area, Aesult, Element, Joint, OutputCase, STWang, STZang. Rows 759-1392.

Table with 6 columns: Area, Aesult, Element, Joint, OutputCase, STWang, STZang. Rows 761-1392.

Table with 6 columns: Area, Aesult, Element, Joint, OutputCase, STWang, STZang. Rows 763-1403.

Table with 6 columns: Area, Aesult, Element, Joint, OutputCase, STWang, STZang. Rows 764-1511.

Table with 6 columns: Area, Aesult, Element, Joint, OutputCase, STWang, STZang. Rows 766-1514.

Table with 6 columns: Area, Aesult, Element, Joint, OutputCase, STWang, STZang. Rows 767-1516.

Table with 6 columns: Area, Aesult, Element, Joint, OutputCase, STWang, STZang. Rows 769-1421.

Table with 6 columns: Area, Aesult, Element, Joint, OutputCase, STWang, STZang. Rows 770-1423.

Table with 6 columns: Area, Aesult, Element, Joint, OutputCase, STWang, STZang. Rows 772-1424.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AesID, Elem, Joint, OutputCase, STXang, STZang. Rows 774-775.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AesID, Elem, Joint, OutputCase, STXang, STZang. Rows 775-776.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AesID, Elem, Joint, OutputCase, STXang, STZang. Rows 777-778.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AesID, Elem, Joint, OutputCase, STXang, STZang. Rows 778-779.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AesID, Elem, Joint, OutputCase, STXang, STZang. Rows 780-781.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AesID, Elem, Joint, OutputCase, STXang, STZang. Rows 782-783.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AesID, Elem, Joint, OutputCase, STXang, STZang. Rows 784-785.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AesID, Elem, Joint, OutputCase, STXang, STZang. Rows 786-787.

Table 26: Element Stresses - Area Shells, Part 1 of 3. Columns: Area, AesID, Elem, Joint, OutputCase, STXang, STZang. Rows 788-789.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZAvg, KN/m2. Rows 802-903.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZAvg, KN/m2. Rows 803-905.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZAvg, KN/m2. Rows 805-906.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZAvg, KN/m2. Rows 806-907.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZAvg, KN/m2. Rows 808-909.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZAvg, KN/m2. Rows 809-911.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZAvg, KN/m2. Rows 811-913.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZAvg, KN/m2. Rows 813-914.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AreaElem, Joint, OutputCase, STDAvg, SZAvg, KN/m2. Rows 814-916.

Table 26: Element Stresses - Area Shells, Part 3 of 3. Columns: Area, AxialElem, Joint, OutputCase, STDAvg, SZ2Avg, KNm2. Rows: 816-817, 818-819, 820-821, 822-823, 824-825, 826-827, 828-829, 830-831, 832-833, 834-835, 836-837, 838-839, 840-841, 842-843, 844-845, 846-847, 848-849, 850-851, 852-853, 854-855, 856-857, 858-859, 860-861, 862-863, 864-865, 866-867, 868-869, 870-871, 872-873, 874-875, 876-877, 878-879, 880-881, 882-883, 884-885, 886-887, 888-889, 890-891, 892-893, 894-895, 896-897, 898-899, 900-901, 902-903, 904-905, 906-907, 908-909, 910-911, 912-913, 914-915, 916-917, 918-919, 920-921, 922-923, 924-925, 926-927, 928-929, 930-931, 932-933, 934-935, 936-937, 938-939, 940-941, 942-943, 944-945, 946-947, 948-949, 950-951, 952-953, 954-955, 956-957, 958-959, 960-961, 962-963, 964-965, 966-967, 968-969, 970-971, 972-973, 974-975, 976-977, 978-979, 980-981, 982-983, 984-985, 986-987, 988-989, 990-991, 992-993, 994-995, 996-997, 998-999, 1000-1001, 1002-1003, 1004-1005, 1006-1007, 1008-1009, 1010-1011, 1012-1013, 1014-1015, 1016-1017, 1018-1019, 1020-1021, 1022-1023, 1024-1025, 1026-1027, 1028-1029, 1030-1031, 1032-1033, 1034-1035, 1036-1037, 1038-1039, 1040-1041, 1042-1043, 1044-1045, 1046-1047, 1048-1049, 1050-1051, 1052-1053, 1054-1055, 1056-1057, 1058-1059, 1060-1061, 1062-1063, 1064-1065, 1066-1067, 1068-1069, 1070-1071, 1072-1073, 1074-1075, 1076-1077, 1078-1079, 1080-1081, 1082-1083, 1084-1085, 1086-1087, 1088-1089, 1090-1091, 1092-1093, 1094-1095, 1096-1097, 1098-1099, 1100-1101, 1102-1103, 1104-1105, 1106-1107, 1108-1109, 1110-1111, 1112-1113, 1114-1115, 1116-1117, 1118-1119, 1120-1121, 1122-1123, 1124-1125, 1126-1127, 1128-1129, 1130-1131, 1132-1133, 1134-1135, 1136-1137, 1138-1139, 1140-1141, 1142-1143, 1144-1145, 1146-1147, 1148-1149, 1150-1151, 1152-1153, 1154-1155, 1156-1157, 1158-1159, 1160-1161, 1162-1163, 1164-1165, 1166-1167, 1168-1169, 1170-1171, 1172-1173, 1174-1175, 1176-1177, 1178-1179, 1180-1181, 1182-1183, 1184-1185, 1186-1187, 1188-1189, 1190-1191, 1192-1193, 1194-1195, 1196-1197, 1198-1199, 1200-1201, 1202-1203, 1204-1205, 1206-1207, 1208-1209, 1210-1211, 1212-1213, 1214-1215, 1216-1217, 1218-1219, 1220-1221, 1222-1223, 1224-1225, 1226-1227, 1228-1229, 1230-1231, 1232-1233, 1234-1235, 1236-1237, 1238-1239, 1240-1241, 1242-1243, 1244-1245, 1246-1247, 1248-1249, 1250-1251, 1252-1253, 1254-1255, 1256-1257, 1258-1259, 1260-1261, 1262-1263, 1264-1265, 1266-1267, 1268-1269, 1270-1271, 1272-1273, 1274-1275, 1276-1277, 1278-1279, 1280-1281, 1282-1283, 1284-1285, 1286-1287, 1288-1289, 1290-1291, 1292-1293, 1294-1295, 1296-1297, 1298-1299, 1300-1301, 1302-1303, 1304-1305, 1306-1307, 1308-1309, 1310-1311, 1312-1313, 1314-1315, 1316-1317, 1318-1319, 1320-1321, 1322-1323, 1324-1325, 1326-1327, 1328-1329, 1330-1331, 1332-1333, 1334-1335, 1336-1337, 1338-1339, 1340-1341, 1342-1343, 1344-1345, 1346-1347, 1348-1349, 1350-1351, 1352-1353, 1354-1355, 1356-1357, 1358-1359, 1360-1361, 1362-1363, 1364-1365, 1366-1367, 1368-1369, 1370-1371, 1372-1373, 1374-1375, 1376-1377, 1378-1379, 1380-1381, 1382-1383, 1384-1385, 1386-1387, 1388-1389, 1390-1391, 1392-1393, 1394-1395, 1396-1397, 1398-1399, 1400-1401, 1402-1403, 1404-1405, 1406-1407, 1408-1409, 1410-1411, 1412-1413, 1414-1415, 1416-1417, 1418-1419, 1420-1421, 1422-1423, 1424-1425, 1426-1427, 1428-1429, 1430-1431, 1432-1433, 1434-1435, 1436-1437, 1438-1439, 1440-1441, 1442-1443, 1444-1445, 1446-1447, 1448-1449, 1450-1451, 1452-1453, 1454-1455, 1456-1457, 1458-1459, 1460-1461, 1462-1463, 1464-1465, 1466-1467, 1468-1469, 1470-1471, 1472-1473, 1474-1475, 1476-1477, 1478-1479, 1480-1481, 1482-1483, 1484-1485, 1486-1487, 1488-1489, 1490-1491, 1492-1493, 1494-1495, 1496-1497, 1498-1499, 1500-1501, 1502-1503, 1504-1505, 1506-1507, 1508-1509, 1510-1511, 1512-1513, 1514-1515, 1516-1517, 1518-1519, 1520-1521, 1522-1523, 1524-1525, 1526-1527, 1528-1529, 1530-1531, 1532-1533, 1534-1535, 1536-1537, 1538-1539, 1540-1541, 1542-1543, 1544-1545, 1546-1547, 1548-1549, 1550-1551, 1552-1553, 1554-1555, 1556-1557, 1558-1559, 1560-1561, 1562-1563, 1564-1565, 1566-1567, 1568-1569, 1570-1571, 1572-1573, 1574-1575, 1576-1577, 1578-1579, 1580-1581, 1582-1583, 1584-1585, 1586-1587, 1588-1589, 1590-1591, 1592-1593, 1594-1595, 1596-1597, 1598-1599, 1600-1601, 1602-1603, 1604-1605, 1606-1607, 1608-1609, 1610-1611, 1612-1613, 1614-1615, 1616-1617, 1618-1619, 1620-1621, 1622-1623, 1624-1625, 1626-1627, 1628-1629, 1630-1631, 1632-1633, 1634-1635, 1636-1637, 1638-1639, 1640-1641, 1642-1643, 1644-1645, 1646-1647, 1648-1649, 1650-1651, 1652-1653, 1654-1655, 1656-1657, 1658-1659, 1660-1661, 1662-1663, 1664-1665, 1666-1667, 1668-1669, 1670-1671, 1672-1673, 1674-1675, 1676-1677, 1678-1679, 1680-1681, 1682-1683, 1684-1685, 1686-1687, 1688-1689, 1690-1691, 1692-1693, 1694-1695, 1696-1697, 1698-1699, 1700-1701, 1702-1703, 1704-1705, 1706-1707, 1708-1709, 1710-1711, 1712-1713, 1714-1715, 1716-1717, 1718-1719, 1720-1721, 1722-1723, 1724-1725, 1726-1727, 1728-1729, 1730-1731, 1732-1733, 1734-1735, 1736-1737, 1738-1739, 1740-1741, 1742-1743, 1744-1745, 1746-1747, 1748-1749, 1750-1751, 1752-1753, 1754-1755, 1756-1757, 1758-1759, 1760-1761, 1762-1763, 1764-1765, 1766-1767, 1768-1769, 1770-1771, 1772-1773, 1774-1775, 1776-1777, 1778-1779, 1780-1781, 1782-1783, 1784-1785, 1786-1787, 1788-1789, 1790-1791, 1792-1793, 1794-1795, 1796-1797, 1798-1799, 1800-1801, 1802-1803, 1804-1805, 1806-1807, 1808-1809, 1810-1811, 1812-1813, 1814-1815, 1816-1817, 1818-1819, 1820-1821, 1822-1823, 1824-1825, 1826-1827, 1828-1829, 1830-1831, 1832-1833, 1834-1835, 1836-1837, 1838-1839, 1840-1841, 1842-1843, 1844-1845, 1846-1847, 1848-1849, 1850-1851, 1852-1853, 1854-1855, 1856-1857, 1858-1859, 1860-1861, 1862-1863, 1864-1865, 1866-1867, 1868-1869, 1870-1871, 1872-1873, 1874-1875, 1876-1877, 1878-1879, 1880-1881, 1882-1883, 1884-1885, 1886-1887, 1888-1889, 1890-1891, 1892-1893, 1894-1895, 1896-1897, 1898-1899, 1900-1901, 1902-1903, 1904-1905, 1906-1907, 1908-1909, 1910-1911, 1912-1913, 1914-1915, 1916-1917, 1918-1919, 1920-1921, 1922-1923, 1924-1925, 1926-1927, 1928-1929, 1930-1931, 1932-1933, 1934-1935, 1936-1937, 1938-1939, 1940-1941, 1942-1943, 1944-1945, 1946-1947, 1948-1949, 1950-1951, 1952-1953, 1954-1955, 1956-1957, 1958-1959, 1960-1961, 1962-1963, 1964-1965, 1966-1967, 1968-1969, 1970-1971, 1972-1973, 1974-1975, 1976-1977, 1978-1979, 1980-1981, 1982-1983, 1984-1985, 1986-1987, 1988-1989, 1990-1991, 1992-1993, 1994-1995, 1996-1997, 1998-1999, 2000-2001, 2002-2003, 2004-2005, 2006-2007, 2008-2009, 2010-2011, 2012-2013, 2014-2015, 2016-2017, 2018-2019, 2020-2021, 2022-2023, 2024-2025, 2026-2027, 2028-2029, 2030-2031, 2032-2033, 2034-2035, 2036-2037, 2038-2039, 2040-2041, 2042-2043, 2044-2045, 2046-2047, 2048-2049, 2050-2051, 2052-2053, 2054-2055, 2056-2057, 2058-2059, 2060-2061, 2062-2063, 2064-2065, 2066-2067, 2068-2069, 2070-2071, 2072-2073, 2074-2075, 2076-2077, 2078-2079, 2080-2081, 2082-2083, 2084-2085, 2086-2087, 2088-2089, 2090-2091, 2092-2093, 2094-2095, 2096-2097, 2098-2099, 2100-2101, 2102-2103, 2104-2105, 2106-2107, 2108-2109, 2110-2111, 2112-2113, 2114-2115, 2116-2117, 2118-2119, 2120-2121, 2122-2123, 2124-2125, 2126-2127, 2128-2129, 2130-2131, 2132-2133, 2134-2135, 2136-2137, 2138-2139, 2140-2141, 2142-2143, 2144-2145, 2146-2147, 2148-2149, 2150-2151, 2152-2153, 2154-2155, 2156-2157, 2158-2159, 2160-2161, 2162-2163, 2164-2165, 2166-2167, 2168-2169, 2170-2171, 2172-2173, 2174-2175, 2176-2177, 2178-2179, 2180-2181, 2182-2183, 2184-2185, 2186-2187, 2188-2189, 2190-2191, 2192-2193, 2194-2195, 2196-2197, 2198-2199, 2200-2201, 2202-2203, 2204-2205, 2206-2207, 2208-2209, 2210-2211, 2212-2213, 2214-2215, 2216-2217, 2218-2219, 2220-2221, 2222-2223, 2224-2225, 2226-2227, 2228-2229, 2230-2231, 2232-2233, 2234-2235, 2236-2237, 2238-2239, 2240-2241, 2242-2243, 2244-2245, 2246-2247, 2248-2249, 2250-2251, 2252-2253, 2254-2255, 2256-2257, 2258-2259, 2260-2261, 2262-2263, 2264-2265, 2266-2267, 2268-2269, 2270-2271, 2272-2273, 2274-2275, 2276-2277, 2278-2279, 2280-2281, 2282-2283, 2284-2285, 2286-2287, 2288-2289, 2290-2291, 2292-2293, 2294-2295, 2296-2297, 2298-2299, 2300-2301, 2302-2303, 2304-2305, 2306-2307, 2308-2309, 2310-2311, 2312-2313, 2314-2315, 2316-2317, 2318-2319, 2320-2321, 2322-2323, 2324-2325, 2326-2327, 2328-2329, 2330-2331, 2332-2333, 2334-2335, 2336-2337, 2338-2339, 2340-2341, 2342-2343, 2344-2345, 2346-2347, 2348-2349, 2350-2351, 2352-2353, 2354-2355, 2356-2357, 2358-2359, 2360-2361, 2362-2363, 2364-2365, 2366-2367, 2368-2369, 2370-2371, 2372-2373, 2374-2375, 2376-2377, 2378-2379, 2380-2381, 2382-2383, 2384-2385, 2386-2387, 2388-2389, 2390-2391, 2392-2393, 2394-2395, 2396-2397, 2398-2399, 2400-2401, 2402-2403, 2404-2405, 2406-2407, 2408-2409, 2410-2411, 2412-2413, 2414-2415, 2416-2417, 2418-2419, 2420-2421, 2422-2423, 2424-2425, 2426-2427, 2428-2429, 2430-2431, 2432-2433, 2434-2435, 2436-2437, 2438-2439, 2440-2441, 2442-2443, 2444-2445, 2446-2447, 2448-2449, 2450-2451, 2452-2453, 2454-2455, 2456-2457, 2458-2459, 2460-2461, 2462-2463, 2464-2465, 2466-2467, 2468-2469, 2470-2471, 2472-2473, 2474-2475, 2476-2477, 2478-2479, 2480-2481, 2482-2483, 2484-2485, 2486-2487, 2488-2489, 2490-2491, 2492-2493, 2494-2495, 2496-2497, 2498-2499, 2500-2501, 2502-2503, 2504-2505, 2506-2507, 2508-2509, 2510-2511, 2512-2513, 2514-2515, 2516-2517, 2518-2519, 2520-2521, 2522-2523, 2524-2525, 2526-2527, 2528-2529, 2530-2531, 2532-2533, 2534-2535, 2536-2537, 2538-2539, 2540-2541, 2542-2543, 2544-2545, 2546-2547, 2548-2549, 2550-2551, 2552-2553, 2554-2555, 2556-2557, 2558-2559, 2560-2561, 2562-2563, 2564-2565, 2566-2567, 2568-2569, 2570-2571, 2572-2573, 2574-2575, 2576-2577, 2578-2579, 2580-2581, 2582-2583, 2584-2585, 2586-2587, 2588-2589, 2590-2591, 2592-2593, 2594-2595, 2596-2597, 2598-2599, 2600-2601, 2602-2603, 2604-2605, 2606-2607, 2608-2609, 2610-2611, 2612-2613, 2614-2615, 2616-2617, 2618-2619, 2620-2621, 2622-2623, 2624-2625, 2626-2627, 2628-2629, 2630-2631, 2632-2633, 2634-2635, 2636-2637, 2638-2639, 2640-2641, 2642-2643, 2644-2645, 2646-2647, 2648-2649, 2650-2651, 2652-2653, 2654-2655, 2656-2657, 2658-2659, 2660-2661, 2662-2663, 2664-2665, 2666-2667, 2668-2669, 2670-2671, 2672-2673, 2674-2675, 2676-2677, 2678-2679, 2680-2681, 2682-2683, 2684-2685, 2686-2687, 2688-2689, 2690-2691, 2692-2693, 2694-2695, 2696-2697, 2698-2699, 2700-2701, 2702-2703, 2704-2705, 2706-2707, 2708-2709, 2710-2711, 2712-2713, 2714-2715, 2716-2717, 2718-2719, 2720-2721, 2722-2723, 2724-2725, 2726-2727, 2728-2729, 2730-2731, 2732-2733, 2734-2735, 2736-2737, 2738-2739, 2740-2741, 2742-2743, 2744-2745, 2746-2747, 2748-2749, 2750-2751, 2752-2753, 2754-2755, 2756-2757, 2758-2759, 2760-2761, 2762-2763, 2764-2765, 2766-2767, 2768-2769, 2770-2771, 2772-2773, 2774-2775, 2776-2777, 2778-2779, 2780-2781, 2782-2783, 2784-2785, 2786-2787, 2788-2789, 2790-2791, 2792-2793, 2794-2795, 2796-2797, 2798-2799, 2800-2801, 2802-2803, 2804-2805, 2806-2807, 2808-2809, 2810-2811, 2812-2813, 2814-2815, 2816-2817, 2818-2819, 2820-2821, 2822-2823, 2824-2825, 2826-2827, 2828-2829, 2830-2831, 2832-2833, 2834-2835, 2836-2837, 2838-2839, 2840-2841, 2842-2843, 2844-2845, 2846-2847, 2848-2849, 2850-2851, 2852-2853, 2854-2855, 2856-2857, 2858-2859, 2860-2861, 2862-2863, 2864-2865, 2866-2867, 2868-2869, 2870-2871, 2872-2873, 2874-2875, 2876-2877, 2878-2879, 2880-2881, 2882-2883, 2884-2885, 2886-2887, 2888-2889, 2890-2891, 2892-2893, 2894-2895, 2896-2897, 2898-2899, 2900-2901, 2902-2903, 2904-2905, 2906-2907, 2908-2909, 2910-2911, 2912-2913, 2914-2915, 2916-2917, 2918-2919, 2920-2921, 2922-2923, 2924-2925, 2926-2927, 2928-2929, 2930-2931, 2932-2933, 2934-2935, 2936-2937, 2938-2939, 2940-2941, 2942-2943, 2944-2945, 2946-2947, 2948-2949, 2950-2951, 2952-2953, 2954-2955, 2956-2957, 2958-2959, 2960-2961, 2962-2963, 2964-2965, 2966-2967, 2968-2969, 2970-2971, 2972-2973, 2974-2975, 2976-2977, 2978-2979, 2980-2981, 2982-2983, 2984-2985, 2986-2987, 2988-2989, 2990-2991, 2992-2993, 2994-2995, 2996-2997, 2998-2999, 3000-3001, 3002-3003, 3004-3005, 3006-3007, 3008-3009, 3010-3011, 3012-3013, 3014-3015, 3016-3017, 3018-3019, 3020-3021, 3022-3023, 3024-3025, 3026-3027, 3028-3029, 3030-3031, 3032-3033, 3034-3035, 3036-3037, 3038-3039, 3040-3041, 3042-3043, 3044-3045, 3046-3047, 3048-3049, 3050-3051, 3052-3053, 3054-3055, 3056-3057, 3058-3059, 3060-3061, 3062-3063, 3064-3065, 3066-3067, 3068-3069, 3070-3071

Table 26: Element Stresses - Area Shells, Part 3 of 3

| Area | AreaElem | Joint | OutputCase | F13Aveg KN/m2 | S23Aveg KN/m2 |
|------|----------|-------|------------------|------------------|------------------|
| 830 | 830 | 1591 | LL | | |
| 830 | 830 | 1596 | LL | | |
| 830 | 830 | 1527 | LL | | |
| 830 | 830 | 1528 | SISMO X | | |
| 830 | 830 | 1591 | SISMO X | | |
| 830 | 830 | 1589 | SISMO X | | |
| 830 | 830 | 1527 | SISMO Y | | |
| 830 | 830 | 1528 | SISMO Y | | |
| 830 | 830 | 1591 | SISMO Y | | |
| 830 | 830 | 1589 | SISMO Y | | |
| 830 | 830 | 1527 | SISMO Y | | |
| 830 | 830 | 1528 | -Torsion/SISMO X | | |
| 830 | 830 | 1591 | -Torsion/SISMO X | | |
| 830 | 830 | 1589 | -Torsion/SISMO X | | |
| 830 | 830 | 1527 | -Torsion/SISMO X | | |
| 830 | 830 | 1528 | -Torsion/SISMO Y | | |
| 830 | 830 | 1591 | -Torsion/SISMO Y | | |
| 830 | 830 | 1589 | -Torsion/SISMO Y | | |
| 830 | 830 | 1527 | -Torsion/SISMO Y | | |
| 831 | 831 | 1591 | DO | | |
| 831 | 831 | 1572 | DO | | |
| 831 | 831 | 1571 | DO | | |
| 831 | 831 | 1589 | DO | | |
| 831 | 831 | 1591 | DL | | |
| 831 | 831 | 1572 | DL | | |
| 831 | 831 | 1571 | DL | | |
| 831 | 831 | 1589 | DL | | |
| 831 | 831 | 1591 | LL | | |
| 831 | 831 | 1572 | LL | | |
| 831 | 831 | 1571 | LL | | |
| 831 | 831 | 1589 | LL | | |
| 831 | 831 | 1591 | SISMO X | | |
| 831 | 831 | 1572 | SISMO X | | |
| 831 | 831 | 1571 | SISMO X | | |
| 831 | 831 | 1589 | SISMO X | | |
| 831 | 831 | 1591 | SISMO Y | | |
| 831 | 831 | 1572 | SISMO Y | | |
| 831 | 831 | 1571 | SISMO Y | | |
| 831 | 831 | 1589 | SISMO Y | | |
| 831 | 831 | 1591 | -Torsion/SISMO X | | |
| 831 | 831 | 1572 | -Torsion/SISMO X | | |
| 831 | 831 | 1571 | -Torsion/SISMO X | | |
| 831 | 831 | 1589 | -Torsion/SISMO X | | |
| 831 | 831 | 1591 | -Torsion/SISMO Y | | |
| 831 | 831 | 1572 | -Torsion/SISMO Y | | |
| 831 | 831 | 1571 | -Torsion/SISMO Y | | |
| 831 | 831 | 1589 | -Torsion/SISMO Y | | |
| 831 | 831 | 1591 | -Torsion/SISMO X | | |

Table 26: Element Stresses - Area Shells, Part 3 of 3

| Area | AreaElem | Joint | OutputCase | F13Aveg KN/m2 | S23Aveg KN/m2 |
|------|----------|-------|------------------|------------------|------------------|
| 831 | 831 | 1572 | -Torsion/SISMO Y | | |
| 831 | 831 | 1571 | -Torsion/SISMO Y | | |
| 831 | 831 | 1589 | -Torsion/SISMO Y | | |
| 832 | 832 | 1590 | DO | | |
| 832 | 832 | 1593 | DO | | |
| 832 | 832 | 1574 | DO | | |
| 832 | 832 | 1591 | DO | | |
| 832 | 832 | 1590 | DL | | |
| 832 | 832 | 1593 | DL | | |
| 832 | 832 | 1574 | DL | | |
| 832 | 832 | 1591 | DL | | |
| 832 | 832 | 1590 | LL | | |
| 832 | 832 | 1593 | LL | | |
| 832 | 832 | 1574 | LL | | |
| 832 | 832 | 1591 | LL | | |
| 832 | 832 | 1590 | SISMO X | | |
| 832 | 832 | 1593 | SISMO X | | |
| 832 | 832 | 1574 | SISMO X | | |
| 832 | 832 | 1591 | SISMO X | | |
| 832 | 832 | 1590 | SISMO Y | | |
| 832 | 832 | 1593 | SISMO Y | | |
| 832 | 832 | 1574 | SISMO Y | | |
| 832 | 832 | 1591 | SISMO Y | | |
| 832 | 832 | 1590 | -Torsion/SISMO X | | |
| 832 | 832 | 1593 | -Torsion/SISMO X | | |
| 832 | 832 | 1574 | -Torsion/SISMO X | | |
| 832 | 832 | 1591 | -Torsion/SISMO X | | |
| 832 | 832 | 1590 | -Torsion/SISMO Y | | |
| 832 | 832 | 1593 | -Torsion/SISMO Y | | |
| 832 | 832 | 1574 | -Torsion/SISMO Y | | |
| 832 | 832 | 1591 | -Torsion/SISMO Y | | |

10. Material take-off

This section provides a material take-off.

Table 27: Material List 2 - By Section Property

| Section | ObjcType | NumPieces | TotalLength m | TotalWeight kN |
|-----------------------|----------|-----------|------------------|-------------------|
| MAMPUESTERA REFORZADA | Area | | 4770.831 | |

Table 27: Material List 2 - By Section Property

| Section | ObjcType | NumPieces | TotalLength m | TotalWeight kN |
|--------------|----------|-----------|------------------|-------------------|
| PLACA MACIZA | Area | | 2837.14 | |
| muonorecort1 | Area | | 654.867 | |

11. Design preferences

This section provides the design preferences for each type of design, which typically include material reduction factors, framing type, stress ratio limit, deflection limits, and other code specific items.

11.1. Steel design

Table 28: Preferences - Steel Design - AISC 360-10, Part 1 of 4

| THDesign | FrameType | PartLLF | SFactorLimit | MaxIter | SBC | SelfCode | SelfLoad | ImpFactor |
|-----------|-----------|---------|--------------|---------|-----|----------|----------|-----------|
| Envelopes | SMF | 0.75 | 0.95 | 1 | D | No | No | 1. |

Table 28: Preferences - Steel Design - AISC 360-10, Part 2 of 4

| SystemRho | SystemSds | SystemC1 | SystemC2 | Omega1 | Provision | AMethod | SOMethod | SRMethod |
|-----------|-----------|----------|----------|--------|-----------|---------|-----------------|-------------------|
| 1. | 0.5 | 8. | 5.5 | 3. | LRFD | | Direct Analysis | General 2nd Order |

Table 28: Preferences - Steel Design - AISC 360-10, Part 3 of 4

| NLCoeff | PhiB | PhiC | PhiTY | PhiTF | PhiV | PhiVRollod | PhiVT | PlugWeld |
|---------|------|------|-------|-------|------|------------|-------|----------|
| 0.002 | 0.9 | 0.9 | 0.9 | 0.75 | 0.9 | 1. | 0.9 | Yes |

Table 28: Preferences - Steel Design - AISC 360-10, Part 4 of 4

| HSSWelding | HSSReduce | CheckDefl | DLRat | SFLAndLLR | LLRat | TotalRat | NetRat |
|------------|-----------|-----------|-------|-----------|-------|----------|--------|
| ESW | No | No | 120. | 120. | 300. | 240. | 240. |

11.2. Concrete design

Table 29: Preferences - Concrete Design - ACI 318-14, Part 1 of 2

| THDesign | NumCurves | NumPoints | MinEConc | PartLLF | UPLimit | SelfCat | Rho | Sds |
|-----------|-----------|-----------|----------|---------|---------|---------|-----|-----|
| Envelopes | 24 | 11 | Yes | 0.75 | 0.95 | D | | 0.5 |

Table 29: Preferences - Concrete Design - ACI 318-14, Part 2 of 2

| PhiT | PhiCTot | PhiCSpiral | PhiV | PhiVReinfor | PhiVJoint |
|------|---------|------------|------|-------------|-----------|
| 0.9 | 0.65 | 0.75 | 0.75 | 0.6 | 0.85 |

11.3. Aluminum design

Table 30: Preferences - Aluminum Design - AA 2015, Part 1 of 2

| THDesign | SFactorLimit | Provision | LatFact | UseLatFact | Bridge | OmegaTy | OmegaTr | OmegaC |
|-----------|--------------|-----------|----------|------------|--------|---------|---------|--------|
| Envelopes | 1. | ASD | 1.333333 | No | No | 1.65 | 1.95 | 1.65 |

Table 30: Preferences - Aluminum Design - AA 2015, Part 2 of 2

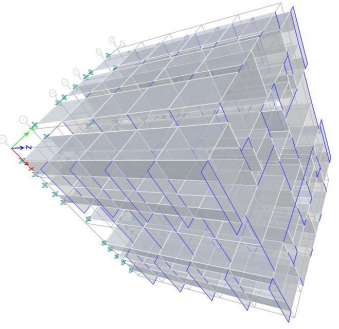
| OmegaSb0 | OmegaBr | OmegaVo | OmegaVt |
|----------|---------|---------|---------|
| 1.65 | 1.95 | 1.65 | 1.95 |

11.4. Cold formed design

Table 31: Preferences - Cold Formed Design - AISI-ASD96

| FrameType | SFactorLim | OmegaBS | OmegaBU | OmegaBL | OmegaVS | OmegaVN | OmegaT | OmegaC |
|--------------|------------|---------|---------|---------|---------|---------|--------|--------|
| Braced Frame | 1. | 1.67 | 1.67 | 1.67 | 1.67 | 1.5 | 1.67 | 1.8 |

ANEXO No 4
MEMORIAS DE CÁLCULO EDIFICIO SISTEMA EN MUROS DE
CARGA



Project Report

Model File: EDIFICIO VIKROS, Revision 0
16/09/2022

Structure Data

16/09/2022

1 Structure Data

This chapter provides model geometry information, including items such as story levels, point coordinates, and element connectivity.

1.1 Story Data

| Tower | Name | Height m | Master Story | Similar No | Splice Story | Color |
|-------|--------|-------------|-----------------|---------------|-----------------|-------|
| T1 | Story1 | 3 | No | None | No | Blue |
| T1 | Story2 | 3 | No | None | No | Blue |
| T1 | Story3 | 3 | No | None | No | Blue |
| T1 | Story4 | 3 | No | None | No | Blue |
| T1 | Story5 | 3 | No | None | No | Blue |

1.2 Grid Data

| Tower | Name | Type | UX m | UY m | RZ deg | Story Range | Radius mm | Visible Color |
|-------|------|------------|---------|---------|-----------|----------------|--------------|------------------|
| T1 | GI | Centerline | 0 | 0 | 0 | Default | 500 | Gray1 |

| Name | Grid Line Type | ID | Ordinate m | Balance Location | Visible |
|-------------------|-------------------|--------|---------------|---------------------|---------|
| GI X (Centerline) | A | D | 0 | End | Yes |
| GI X (Centerline) | B | 2.8 | 11.5 | End | Yes |
| GI X (Centerline) | C | 5.6 | 23 | End | Yes |
| GI X (Centerline) | E | 8.22 | 34.5 | End | Yes |
| GI X (Centerline) | F | 11.03 | 45.5 | End | Yes |
| GI X (Centerline) | G | 13.64 | 57 | End | Yes |
| GI X (Centerline) | H | 16.29 | 68.5 | End | Yes |
| GI X (Centerline) | I | 18.44 | 80 | End | Yes |
| GI X (Centerline) | J | 21.09 | 91.5 | End | Yes |
| GI X (Centerline) | K | 23.74 | 103 | End | Yes |
| GI X (Centerline) | L | 26.39 | 114.5 | End | Yes |
| GI X (Centerline) | M | 29.04 | 126 | End | Yes |
| GI X (Centerline) | N | 31.69 | 137.5 | End | Yes |
| GI X (Centerline) | O | 34.34 | 149 | End | Yes |
| GI X (Centerline) | P | 36.99 | 160.5 | End | Yes |
| GI X (Centerline) | Q | 39.64 | 172 | End | Yes |
| GI X (Centerline) | R | 42.29 | 183.5 | End | Yes |
| GI X (Centerline) | S | 44.94 | 195 | End | Yes |
| GI X (Centerline) | T | 47.59 | 206.5 | End | Yes |
| GI X (Centerline) | U | 50.24 | 218 | End | Yes |
| GI X (Centerline) | V | 52.89 | 229.5 | End | Yes |
| GI X (Centerline) | W | 55.54 | 241 | End | Yes |
| GI X (Centerline) | X | 58.19 | 252.5 | End | Yes |
| GI X (Centerline) | Y | 60.84 | 264 | End | Yes |
| GI X (Centerline) | Z | 63.49 | 275.5 | End | Yes |
| GI X (Centerline) | AA | 66.14 | 287 | End | Yes |
| GI X (Centerline) | AB | 68.79 | 298.5 | End | Yes |
| GI X (Centerline) | AC | 71.44 | 310 | End | Yes |
| GI X (Centerline) | AD | 74.09 | 321.5 | End | Yes |
| GI X (Centerline) | AE | 76.74 | 333 | End | Yes |
| GI X (Centerline) | AF | 79.39 | 344.5 | End | Yes |
| GI X (Centerline) | AG | 82.04 | 356 | End | Yes |
| GI X (Centerline) | AH | 84.69 | 367.5 | End | Yes |
| GI X (Centerline) | AI | 87.34 | 379 | End | Yes |
| GI X (Centerline) | AJ | 90 | 390.5 | End | Yes |
| GI X (Centerline) | AK | 92.64 | 402 | End | Yes |
| GI X (Centerline) | AL | 95 | 413.5 | End | Yes |
| GI X (Centerline) | AM | 97.34 | 425 | End | Yes |
| GI X (Centerline) | AN | 100 | 436.5 | End | Yes |
| GI X (Centerline) | AO | 102.64 | 448 | End | Yes |
| GI X (Centerline) | AP | 105.29 | 459.5 | End | Yes |
| GI X (Centerline) | AQ | 107.94 | 471 | End | Yes |
| GI X (Centerline) | AR | 110.59 | 482.5 | End | Yes |
| GI X (Centerline) | AS | 113.24 | 494 | End | Yes |
| GI X (Centerline) | AT | 115.89 | 505.5 | End | Yes |
| GI X (Centerline) | AU | 118.54 | 517 | End | Yes |
| GI X (Centerline) | AV | 121.19 | 528.5 | End | Yes |
| GI X (Centerline) | AW | 123.84 | 540 | End | Yes |
| GI X (Centerline) | AX | 126.49 | 551.5 | End | Yes |
| GI X (Centerline) | AY | 129.14 | 563 | End | Yes |
| GI X (Centerline) | AZ | 131.79 | 574.5 | End | Yes |
| GI X (Centerline) | BA | 134.44 | 586 | End | Yes |
| GI X (Centerline) | BB | 137.09 | 597.5 | End | Yes |
| GI X (Centerline) | BC | 139.74 | 609 | End | Yes |
| GI X (Centerline) | BD | 142.39 | 620.5 | End | Yes |
| GI X (Centerline) | BE | 145.04 | 632 | End | Yes |
| GI X (Centerline) | BF | 147.69 | 643.5 | End | Yes |
| GI X (Centerline) | BG | 150.34 | 655 | End | Yes |
| GI X (Centerline) | BH | 152.99 | 666.5 | End | Yes |
| GI X (Centerline) | BI | 155.64 | 678 | End | Yes |
| GI X (Centerline) | BJ | 158.29 | 689.5 | End | Yes |
| GI X (Centerline) | BK | 160.94 | 701 | End | Yes |
| GI X (Centerline) | BL | 163.59 | 712.5 | End | Yes |
| GI X (Centerline) | BM | 166.24 | 724 | End | Yes |
| GI X (Centerline) | BN | 168.89 | 735.5 | End | Yes |
| GI X (Centerline) | BO | 171.54 | 747 | End | Yes |
| GI X (Centerline) | BP | 174.19 | 758.5 | End | Yes |
| GI X (Centerline) | BQ | 176.84 | 770 | End | Yes |
| GI X (Centerline) | BR | 179.49 | 781.5 | End | Yes |
| GI X (Centerline) | BS | 182.14 | 793 | End | Yes |
| GI X (Centerline) | BT | 184.79 | 804.5 | End | Yes |
| GI X (Centerline) | BU | 187.44 | 816 | End | Yes |
| GI X (Centerline) | BV | 190.09 | 827.5 | End | Yes |
| GI X (Centerline) | BW | 192.74 | 839 | End | Yes |
| GI X (Centerline) | BX | 195.39 | 850.5 | End | Yes |
| GI X (Centerline) | BY | 198.04 | 862 | End | Yes |
| GI X (Centerline) | BZ | 200.69 | 873.5 | End | Yes |
| GI X (Centerline) | CA | 203.34 | 885 | End | Yes |
| GI X (Centerline) | CB | 205.99 | 896.5 | End | Yes |
| GI X (Centerline) | CC | 208.64 | 908 | End | Yes |
| GI X (Centerline) | CD | 211.29 | 919.5 | End | Yes |
| GI X (Centerline) | CE | 213.94 | 931 | End | Yes |
| GI X (Centerline) | CF | 216.59 | 942.5 | End | Yes |
| GI X (Centerline) | CG | 219.24 | 954 | End | Yes |
| GI X (Centerline) | CH | 221.89 | 965.5 | End | Yes |
| GI X (Centerline) | CI | 224.54 | 977 | End | Yes |
| GI X (Centerline) | CJ | 227.19 | 988.5 | End | Yes |
| GI X (Centerline) | CK | 229.84 | 1000 | End | Yes |
| GI X (Centerline) | CL | 232.49 | 1011.5 | End | Yes |
| GI X (Centerline) | CM | 235.14 | 1023 | End | Yes |
| GI X (Centerline) | CN | 237.79 | 1034.5 | End | Yes |
| GI X (Centerline) | CO | 240.44 | 1046 | End | Yes |
| GI X (Centerline) | CP | 243.09 | 1057.5 | End | Yes |
| GI X (Centerline) | CQ | 245.74 | 1069 | End | Yes |
| GI X (Centerline) | CR | 248.39 | 1080.5 | End | Yes |
| GI X (Centerline) | CS | 251.04 | 1092 | End | Yes |
| GI X (Centerline) | CT | 253.69 | 1103.5 | End | Yes |
| GI X (Centerline) | CU | 256.34 | 1115 | End | Yes |
| GI X (Centerline) | CV | 258.99 | 1126.5 | End | Yes |
| GI X (Centerline) | CU | 261.64 | 1138 | End | Yes |
| GI X (Centerline) | CV | 264.29 | 1149.5 | End | Yes |
| GI X (Centerline) | CU | 266.94 | 1161 | End | Yes |
| GI X (Centerline) | CV | 269.59 | 1172.5 | End | Yes |
| GI X (Centerline) | CU | 272.24 | 1184 | End | Yes |
| GI X (Centerline) | CV | 274.89 | 1195.5 | End | Yes |
| GI X (Centerline) | CU | 277.54 | 1207 | End | Yes |
| GI X (Centerline) | CV | 280.19 | 1218.5 | End | Yes |
| GI X (Centerline) | CU | 282.84 | 1230 | End | Yes |
| GI X (Centerline) | CV | 285.49 | 1241.5 | End | Yes |
| GI X (Centerline) | CU | 288.14 | 1253 | End | Yes |
| GI X (Centerline) | CV | 290.79 | 1264.5 | End | Yes |
| GI X (Centerline) | CU | 293.44 | 1276 | End | Yes |
| GI X (Centerline) | CV | 296.09 | 1287.5 | End | Yes |
| GI X (Centerline) | CU | 298.74 | 1299 | End | Yes |
| GI X (Centerline) | CV | 301.39 | 1310.5 | End | Yes |
| GI X (Centerline) | CU | 304.04 | 1322 | End | Yes |
| GI X (Centerline) | CV | 306.69 | 1333.5 | End | Yes |
| GI X (Centerline) | CU | 309.34 | 1345 | End | Yes |
| GI X (Centerline) | CV | 311.99 | 1356.5 | End | Yes |
| GI X (Centerline) | CU | 314.64 | 1368 | End | Yes |
| GI X (Centerline) | CV | 317.29 | 1379.5 | End | Yes |
| GI X (Centerline) | CU | 320 | 1391 | End | Yes |
| GI X (Centerline) | CV | 322.64 | 1402.5 | End | Yes |
| GI X (Centerline) | CV | 325.29 | 1414 | End | Yes |
| GI X (Centerline) | CV | 327.94 | 1425.5 | End | Yes |
| GI X (Centerline) | CV | 330.59 | 1437 | End | Yes |
| GI X (Centerline) | CV | 333.24 | 1448.5 | End | Yes |
| GI X (Centerline) | CV | 335.89 | 1460 | End | Yes |
| GI X (Centerline) | CV | 338.54 | 1471.5 | End | Yes |
| GI X (Centerline) | CV | 341.19 | 1483 | End | Yes |
| GI X (Centerline) | CV | 343.84 | 1494.5 | End | Yes |
| GI X (Centerline) | CV | 346.49 | 1506 | End | Yes |
| GI X (Centerline) | CV | 349.14 | 1517.5 | End | Yes |
| GI X (Centerline) | CV | 351.79 | 1529 | End | Yes |
| GI X (Centerline) | CV | 354.44 | 1540.5 | End | Yes |
| GI X (Centerline) | CV | 357.09 | 1552 | End | Yes |
| GI X (Centerline) | CV | 359.74 | 1563.5 | End | Yes |
| GI X (Centerline) | CV | 362.39 | 1575 | End | Yes |
| GI X (Centerline) | CV | 365.04 | 1586.5 | End | Yes |
| GI X (Centerline) | CV | 367.69 | 1598 | End | Yes |
| GI X (Centerline) | CV | 370.34 | 1609.5 | End | Yes |
| GI X (Centerline) | CV | 372.99 | 1621 | End | Yes |
| GI X (Centerline) | CV | 375.64 | 1632.5 | End | Yes |
| GI X (Centerline) | CV | 378.29 | 1644 | End | Yes |
| GI X (Centerline) | CV | 380.94 | 1655.5 | End | Yes |
| GI X (Centerline) | CV | 383.59 | 1667 | End | Yes |
| GI X (Centerline) | CV | 386.24 | 1678.5 | End | Yes |
| GI X (Centerline) | CV | 388.89 | 1690 | End | Yes |
| GI X (Centerline) | CV | 391.54 | 1701.5 | End | Yes |
| GI X (Centerline) | CV | 394.19 | 1713 | End | Yes |
| GI X (Centerline) | CV | 396.84 | 1724.5 | End | Yes |
| GI X (Centerline) | CV | 399.49 | 1736 | End | Yes |
| GI X (Centerline) | CV | 402.14 | 1747.5 | End | Yes |
| GI X (Centerline) | CV | 404.79 | 1759 | End | Yes |
| GI X (Centerline) | CV | 407.44 | 1770.5 | End | Yes |
| GI X (Centerline) | CV | 410.09 | 1782 | End | Yes |
| GI X (Centerline) | CV | 412.74 | 1793.5 | End | Yes |
| GI X (Centerline) | CV | 415.39 | 1805 | End | Yes |
| GI X (Centerline) | CV | 418.04 | 1816.5 | End | Yes |
| GI X (Centerline) | CV | 420.69 | 1828 | End | Yes |
| GI X (Centerline) | CV | 423.34 | 1839.5 | End | Yes |
| GI X (Centerline) | CV | 425.99 | 1851 | End | Yes |
| GI X (Centerline) | CV | 428.64 | 1862.5 | End | Yes |
| GI X (Centerline) | CV | 431.29 | 1874 | End | Yes |
| GI X (Centerline) | CV | 433.94 | 1885.5 | End | Yes |
| GI X (Centerline) | CV | 436.59 | 1897 | End | Yes |
| GI X (Centerline) | CV | 439.24 | 1908.5 | End | Yes |
| GI X (Centerline) | CV | 441.89 | 1920 | End | Yes |
| GI X (Centerline) | CV | 444.54 | 1931.5 | End | Yes |
| GI X (Centerline) | CV | 447.19 | 1943 | End | Yes |
| GI X (Centerline) | CV | 449.84 | 1954.5 | End | Yes |
| GI X (Centerline) | CV | 452.49 | 1966 | End | Yes |
| GI X (Centerline) | CV | 455.14 | 1977.5 | End | Yes |
| GI X (Centerline) | CV | 457.79 | 1989 | End | Yes |
| GI X (Centerline) | CV | 460.44 | 2000.5 | End | Yes |
| GI X (Centerline) | CV | 463.09 | 2012 | End | Yes |
| GI X (Centerline) | CV | 465.74 | 2023.5 | End | Yes |
| GI X (Centerline) | CV | 468.39 | 2035 | End | Yes |
| GI X (Centerline) | CV | 471.04 | 2046.5 | End | Yes |
| GI X (Centerline) | CV | 473.69 | 2058 | End | Yes |
| GI X (Centerline) | CV | 476.34 | 2069.5 | End | Yes |
| GI X (Centerline) | CV | 478.99 | 2081 | End | Yes |
| GI X (Centerline) | CV | 481.64 | | | |

Table 14 - Point Byte (continued)

| Label | Is Auto | X | Y | D&B | Row |
|-------|---------|--------|-------|-----|-----|
| Point | m | m | m | | |
| 81 | No | 5.20 | 0.39 | 0 | 0 |
| 82 | No | 11.47 | 14.41 | 0 | 0 |
| 83 | No | 12.301 | 6.225 | 0 | 0 |
| 84 | No | 12.89 | 10.6 | 0 | 0 |
| 85 | No | 10.39 | 10.5 | 0 | 0 |
| 86 | No | 13.65 | 10.5 | 0 | 0 |
| 87 | No | 13.65 | 10.5 | 0 | 0 |
| 88 | No | 12.89 | 10.6 | 0 | 0 |
| 89 | No | 8.32 | 8.32 | 0 | 0 |
| 90 | No | 8.32 | 8.32 | 0 | 0 |
| 91 | No | 1.19 | 0 | 0 | 0 |
| 92 | No | 2.61 | 0 | 0 | 0 |
| 93 | No | 3.08 | 0 | 0 | 0 |
| 94 | No | 3.08 | 0 | 0 | 0 |
| 95 | No | 15.44 | 0 | 0 | 0 |
| 96 | No | 15.44 | 0 | 0 | 0 |
| 97 | No | 14.13 | 0 | 0 | 0 |
| 98 | No | 13.06 | 0 | 0 | 0 |
| 99 | No | 11.84 | 0 | 0 | 0 |
| 100 | No | 11.04 | 0.68 | 0 | 0 |
| 101 | No | 11.04 | 0.68 | 0 | 0 |
| 102 | No | 11.04 | 0.68 | 0 | 0 |
| 103 | No | 11.04 | 0.68 | 0 | 0 |
| 104 | No | 11.04 | 0.68 | 0 | 0 |
| 105 | No | 5.6 | 0.48 | 0 | 0 |
| 106 | No | 5.6 | 0.48 | 0 | 0 |
| 107 | No | 5.6 | 0.48 | 0 | 0 |
| 108 | No | 5.6 | 0.48 | 0 | 0 |
| 109 | No | 6.72 | 0.39 | 0 | 0 |
| 110 | No | 6.72 | 0.39 | 0 | 0 |
| 111 | No | 6.72 | 0.39 | 0 | 0 |
| 112 | No | 6.72 | 0.39 | 0 | 0 |
| 113 | No | 4.07 | 8.32 | 0 | 0 |
| 114 | No | 4.07 | 8.32 | 0 | 0 |
| 115 | No | 16.64 | 8.32 | 0 | 0 |
| 116 | No | 16.64 | 8.32 | 0 | 0 |
| 117 | No | 8.32 | 0 | 0 | 0 |
| 118 | No | 8.32 | 0 | 0 | 0 |
| 119 | No | 11.67 | 8.32 | 0 | 0 |
| 120 | No | 9.28 | 0.39 | 0 | 0 |
| 121 | No | 9.28 | 0.39 | 0 | 0 |
| 122 | No | 9.28 | 0.39 | 0 | 0 |
| 123 | No | 9.28 | 0.39 | 0 | 0 |
| 124 | No | 1.19 | 14.14 | 0 | 0 |
| 125 | No | 2.61 | 14.14 | 0 | 0 |
| 126 | No | 3.08 | 14.14 | 0 | 0 |
| 127 | No | 3.08 | 14.14 | 0 | 0 |
| 128 | No | 4.65 | 14.14 | 0 | 0 |
| 129 | No | 4.65 | 14.14 | 0 | 0 |
| 130 | No | 15.44 | 14.14 | 0 | 0 |
| 131 | No | 15.44 | 14.14 | 0 | 0 |
| 132 | No | 13.06 | 14.14 | 0 | 0 |
| 133 | No | 11.84 | 14.14 | 0 | 0 |
| 134 | No | 11.84 | 14.14 | 0 | 0 |
| 135 | No | 11.84 | 14.14 | 0 | 0 |
| 136 | No | 11.84 | 14.14 | 0 | 0 |
| 137 | No | 11.84 | 14.14 | 0 | 0 |
| 138 | No | 11.84 | 14.14 | 0 | 0 |
| 139 | No | 11.84 | 14.14 | 0 | 0 |
| 140 | No | 11.84 | 14.14 | 0 | 0 |
| 141 | No | 1.19 | 2.61 | 0 | 0 |
| 142 | No | 1.19 | 2.61 | 0 | 0 |
| 143 | No | 3.08 | 2.61 | 0 | 0 |
| 144 | No | 3.08 | 2.61 | 0 | 0 |
| 145 | No | 4.65 | 2.61 | 0 | 0 |
| 146 | No | 4.65 | 2.61 | 0 | 0 |

Table 14 - Point Byte (continued)

| Label | Is Auto | X | Y | D&B | Row |
|-------|---------|--------|-------|-----|-----|
| Point | m | m | m | | |
| 147 | No | 15.44 | 2.61 | 0 | 0 |
| 148 | No | 15.44 | 2.61 | 0 | 0 |
| 149 | No | 16.64 | 2.61 | 0 | 0 |
| 150 | No | 16.64 | 2.61 | 0 | 0 |
| 151 | No | 13.2 | 2.61 | 0 | 0 |
| 152 | No | 13.2 | 2.61 | 0 | 0 |
| 153 | No | 0 | 11.63 | 0 | 0 |
| 154 | No | 1.19 | 11.63 | 0 | 0 |
| 155 | No | 1.19 | 11.63 | 0 | 0 |
| 156 | No | 3.28 | 11.63 | 0 | 0 |
| 157 | No | 3.28 | 11.63 | 0 | 0 |
| 158 | No | 4.44 | 11.63 | 0 | 0 |
| 159 | No | 4.44 | 11.63 | 0 | 0 |
| 160 | No | 16.64 | 11.63 | 0 | 0 |
| 161 | No | 16.64 | 11.63 | 0 | 0 |
| 162 | No | 13.02 | 11.63 | 0 | 0 |
| 163 | No | 13.02 | 11.63 | 0 | 0 |
| 164 | No | 13.2 | 11.63 | 0 | 0 |
| 165 | No | 13.2 | 11.63 | 0 | 0 |
| 166 | No | 5.6 | 8.32 | 0 | 0 |
| 167 | No | 5.6 | 8.32 | 0 | 0 |
| 168 | No | 8.32 | 8.32 | 0 | 0 |
| 169 | No | 8.32 | 8.32 | 0 | 0 |
| 170 | No | 4.31 | 8.32 | 0 | 0 |
| 171 | No | 4.31 | 8.32 | 0 | 0 |
| 172 | No | 13.061 | 8.32 | 0 | 0 |
| 173 | No | 13.061 | 8.32 | 0 | 0 |
| 174 | No | 3.75 | 3.54 | 0 | 0 |
| 175 | No | 4.31 | 3.54 | 0 | 0 |
| 176 | No | 4.31 | 3.54 | 0 | 0 |
| 177 | No | 12.89 | 3.54 | 0 | 0 |
| 178 | No | 12.89 | 3.54 | 0 | 0 |
| 179 | No | 1.19 | -0.72 | 0 | 0 |
| 180 | No | 1.19 | -0.72 | 0 | 0 |
| 181 | No | 1.19 | -0.72 | 0 | 0 |
| 182 | No | 1.19 | -0.72 | 0 | 0 |
| 183 | No | 5.6 | 14.65 | 0 | 0 |
| 184 | No | 5.6 | 14.65 | 0 | 0 |
| 185 | No | 15.44 | 14.65 | 0 | 0 |
| 186 | No | 15.44 | 14.65 | 0 | 0 |
| 187 | No | 2.99 | 2.61 | 0 | 0 |
| 188 | No | 2.99 | 2.61 | 0 | 0 |
| 189 | No | 2.99 | 2.61 | 0 | 0 |
| 190 | No | 2.99 | 2.61 | 0 | 0 |
| 191 | No | 2.99 | 2.61 | 0 | 0 |
| 192 | No | 2.99 | 2.61 | 0 | 0 |
| 193 | No | 5.6 | 5.79 | 0 | 0 |
| 194 | No | 5.6 | 5.79 | 0 | 0 |
| 195 | No | 6.33 | 5.79 | 0 | 0 |
| 196 | No | 6.33 | 5.79 | 0 | 0 |
| 197 | No | 4.44 | 5.79 | 0 | 0 |
| 198 | No | 4.44 | 5.79 | 0 | 0 |
| 199 | No | 13.061 | 2.61 | 0 | 0 |
| 200 | No | 13.061 | 2.61 | 0 | 0 |
| 201 | No | 11.04 | 11.63 | 0 | 0 |
| 202 | No | 11.04 | 11.63 | 0 | 0 |
| 203 | No | 11.04 | 11.63 | 0 | 0 |
| 204 | No | 11.04 | 11.63 | 0 | 0 |
| 205 | No | 11.04 | 11.63 | 0 | 0 |
| 206 | No | 11.04 | 11.63 | 0 | 0 |
| 207 | No | 11.04 | 11.63 | 0 | 0 |
| 208 | No | 11.04 | 11.63 | 0 | 0 |
| 209 | No | 11.04 | 11.63 | 0 | 0 |
| 210 | No | 11.04 | 11.63 | 0 | 0 |
| 211 | No | 11.04 | 11.63 | 0 | 0 |
| 212 | No | 11.04 | 11.63 | 0 | 0 |
| 213 | No | 11.04 | 11.63 | 0 | 0 |
| 214 | No | 6.72 | 5.79 | 0 | 0 |

Table 14 - Point Byte (continued)

| Label | Is Auto | X | Y | D&B | Row |
|-------|---------|-------|------|-----|-----|
| Point | m | m | m | | |
| 215 | No | 11.07 | 5.79 | 0 | 0 |
| 216 | No | 11.07 | 5.79 | 0 | 0 |
| 217 | No | 8.32 | 5.79 | 0 | 0 |
| 218 | No | 8.32 | 5.79 | 0 | 0 |
| 219 | No | 4.31 | 5.79 | 0 | 0 |
| 220 | No | 4.31 | 5.79 | 0 | 0 |
| 221 | No | 2.99 | 5.79 | 0 | 0 |
| 222 | No | 2.99 | 5.79 | 0 | 0 |
| 223 | No | 4.31 | 10.6 | 0 | 0 |
| 224 | No | 4.31 | 10.6 | 0 | 0 |
| 225 | No | 3.75 | 10.6 | 0 | 0 |
| 226 | No | 3.75 | 10.6 | 0 | 0 |
| 227 | No | 12.89 | 10.6 | 0 | 0 |
| 228 | No | 12.89 | 10.6 | 0 | 0 |
| 229 | No | 5.6 | 10.6 | 0 | 0 |
| 230 | No | 5.6 | 10.6 | 0 | 0 |

1.4 Line Connectivity

Table 15 - Beam Byte

| Label | Point/Beam | Point/Beam | Point/Beam | Point/Beam |
|-------|------------|------------|------------|------------|
| 81 | 207 | 211 | 211 | 211 |
| 82 | 131 | 133 | 133 | 133 |
| 83 | 153 | 155 | 155 | 155 |
| 84 | 108 | 112 | 112 | 112 |
| 85 | 40 | 44 | 44 | 44 |
| 86 | 113 | 160 | 160 | 160 |
| 87 | 114 | 164 | 164 | 164 |
| 88 | 113 | 96 | 96 | 96 |
| 89 | 64 | 114 | 114 | 114 |
| 90 | 64 | 100 | 100 | 100 |
| 91 | 101 | 101 | 101 | 101 |
| 92 | 96 | 100 | 100 | 100 |
| 93 | 108 | 108 | 108 | 108 |
| 94 | 124 | 106 | 106 | 106 |
| 95 | 133 | 34 | 34 | 34 |
| 96 | 116 | 109 | 109 | 109 |
| 97 | 116 | 109 | 109 | 109 |
| 98 | 177 | 120 | 120 | 120 |
| 99 | 120 | 6 | 6 | 6 |
| 100 | 106 | 129 | 129 | 129 |
| 101 | 106 | 129 | 129 | 129 |
| 102 | 106 | 129 | 129 | 129 |
| 103 | 106 | 129 | 129 | 129 |
| 104 | 106 | 129 | 129 | 129 |
| 105 | 106 | 129 | 129 | 129 |
| 106 | 106 | 129 | 129 | 129 |
| 107 | 106 | 129 | 129 | 129 |
| 108 | 106 | 129 | 129 | 129 |
| 109 | 106 | 129 | 129 | 129 |
| 110 | 106 | 129 | 129 | 129 |
| 111 | 106 | 129 | 129 | 129 |
| 112 | 106 | 129 | 129 | 129 |
| 113 | 106 | 129 | 129 | 129 |
| 114 | 106 | 129 | 129 | 129 |
| 115 | 106 | 129 | 129 | 129 |
| 116 | 106 | 129 | 129 | 129 |
| 117 | 106 | 129 | 129 | 129 |
| 118 | 106 | 129 | 129 | 129 |
| 119 | 106 | 129 | 129 | 129 |
| 120 | 106 | 129 | 129 | 129 |
| 121 | 106 | 129 | 129 | 129 |
| 122 | 106 | 129 | 129 | 129 |
| 123 | 106 | 129 | 129 | 129 |
| 124 | 106 | 129 | 129 | 129 |
| 125 | 106 | 129 | 129 | 129 |
| 126 | 106 | 129 | 129 | 129 |
| 127 | 106 | 129 | 129 | 129 |
| 128 | 106 | 129 | 129 | 129 |
| 129 | 106 | 129 | 129 | 129 |
| 130 | 106 | 129 | 129 | 129 |
| 131 | 106 | 129 | 129 | 129 |
| 132 | 106 | 129 | 129 | 129 |
| 133 | 106 | 129 | 129 | 129 |
| 134 | 106 | 129 | 129 | 129 |
| 135 | 106 | 129 | 129 | 129 |
| 136 | 106 | 129 | 129 | 129 |
| 137 | 106 | 129 | 129 | 129 |
| 138 | 106 | 129 | 129 | 129 |
| 139 | 106 | 129 | 129 | 129 |
| 140 | 106 | 129 | 129 | 129 |
| 141 | 106 | 129 | 129 | 129 |
| 142 | 106 | 129 | 129 | 129 |
| 143 | 106 | 129 | 129 | 129 |
| 144 | 106 | 129 | 129 | 129 |
| 145 | 106 | 129 | 129 | 129 |
| 146 | 106 | 129 | 129 | 129 |
| 147 | 106 | 129 | 129 | 129 |
| 148 | 106 | 129 | 129 | 129 |
| 149 | 106 | 129 | 129 | 129 |
| 150 | 106 | 129 | 129 | 129 |
| 151 | 106 | 129 | 129 | 129 |
| 152 | 106 | 129 | 129 | 129 |
| 153 | 106 | 129 | 129 | 129 |
| 154 | 106 | 129 | 129 | 129 |
| 155 | 106 | 129 | 129 | 129 |
| 156 | 106 | 129 | 129 | 129 |
| 157 | 106 | 129 | 129 | 129 |
| 158 | 106 | 129 | 129 | 129 |
| 159 | 106 | 129 | 129 | 129 |
| 160 | 106 | 129 | 129 | 129 |
| 161 | 106 | 129 | 129 | 129 |
| 162 | 106 | 129 | 129 | 129 |
| 163 | 106 | 129 | 129 | 129 |
| 164 | 106 | 129 | 129 | 129 |
| 165 | 106 | 129 | 129 | 129 |
| 166 | 106 | 129 | 129 | 129 |
| 167 | 106 | 129 | 129 | 129 |
| | | | | |

Table 17 - Wall Bay (continued)

| Label | NumPoints | PointNumber | PointID | PointType |
|-------|-----------|-------------|---------|-----------|
| W02 | 2 | 223 | | Below |
| W02 | 3 | 44 | | Same |
| W02 | 4 | 109 | | Same |
| W02 | 4 | 142 | | Same |
| W03 | 2 | 46 | | Below |
| W03 | 3 | 229 | | Same |
| W03 | 4 | 45 | | Same |
| W04 | 1 | 63 | | Below |
| W04 | 2 | 62 | | Below |
| W04 | 4 | 63 | | Same |
| W04 | 4 | 64 | | Same |
| W05 | 4 | 64 | | Below |
| W05 | 4 | 65 | | Below |
| W06 | 2 | 225 | | Below |
| W06 | 3 | 47 | | Same |
| W06 | 4 | 130 | | Same |
| W07 | 4 | 1 | | Below |
| W07 | 2 | 147 | | Below |
| W07 | 4 | 148 | | Same |
| W07 | 4 | 52 | | Same |
| W08 | 4 | 107 | | Below |
| W08 | 2 | 105 | | Below |
| W08 | 4 | 52 | | Same |
| W08 | 4 | 53 | | Same |
| W09 | 2 | 61 | | Below |
| W09 | 3 | 126 | | Same |
| W09 | 4 | 60 | | Same |
| W10 | 4 | 56 | | Below |
| W10 | 2 | 109 | | Below |
| W10 | 4 | 57 | | Same |
| W10 | 4 | 58 | | Same |
| W11 | 4 | 91 | | Below |
| W11 | 2 | 92 | | Below |
| W11 | 3 | 128 | | Same |
| W11 | 4 | 129 | | Same |
| W12 | 2 | 119 | | Below |
| W12 | 3 | 69 | | Same |
| W12 | 4 | 205 | | Below |
| W13 | 4 | 1 | | Below |
| W13 | 2 | 70 | | Below |
| W13 | 3 | 221 | | Same |

Table 17 - Wall Bay (continued)

| Label | NumPoints | PointNumber | PointID | PointType |
|-------|-----------|-------------|---------|-----------|
| W13 | 4 | 71 | | Same |
| W14 | 1 | 50 | | Below |
| W14 | 2 | 49 | | Below |
| W14 | 4 | 165 | | Same |
| W14 | 4 | 166 | | Same |
| W15 | 4 | 72 | | Below |
| W15 | 2 | 150 | | Below |
| W15 | 3 | 73 | | Same |
| W15 | 4 | 72 | | Same |
| W16 | 2 | 18 | | Below |
| W16 | 3 | 191 | | Same |
| W16 | 4 | 114 | | Same |
| W17 | 4 | 1 | | Below |
| W17 | 2 | 136 | | Below |
| W17 | 4 | 78 | | Same |
| W18 | 4 | 160 | | Below |
| W18 | 2 | 160 | | Below |
| W19 | 4 | 79 | | Same |
| W19 | 3 | 76 | | Same |
| W20 | 4 | 1 | | Below |
| W20 | 2 | 163 | | Below |
| W20 | 4 | 162 | | Same |
| W20 | 4 | 83 | | Same |
| W21 | 4 | 84 | | Below |
| W21 | 2 | 140 | | Below |
| W21 | 3 | 85 | | Same |
| W21 | 4 | 84 | | Same |
| W22 | 2 | 147 | | Below |
| W22 | 3 | 51 | | Same |
| W22 | 4 | 85 | | Same |
| W23 | 4 | 216 | | Below |
| W23 | 2 | 215 | | Below |
| W23 | 4 | 88 | | Same |
| W23 | 4 | 88 | | Same |
| W24 | 4 | 217 | | Below |
| W24 | 2 | 127 | | Below |
| W24 | 3 | 89 | | Same |
| W24 | 4 | 90 | | Same |
| W25 | 4 | 4 | | Below |
| W25 | 3 | 59 | | Same |

Table 17 - Wall Bay (continued)

| Label | NumPoints | PointNumber | PointID | PointType |
|-------|-----------|-------------|---------|-----------|
| W06 | 4 | 2 | | Same |
| W07 | 2 | 67 | | Below |
| W07 | 2 | 66 | | Below |
| W07 | 4 | 180 | | Same |
| W07 | 4 | 180 | | Same |
| W08 | 4 | 71 | | Below |
| W08 | 2 | 70 | | Below |
| W08 | 3 | 221 | | Same |
| W08 | 4 | 187 | | Same |
| W09 | 2 | 87 | | Below |
| W09 | 3 | 215 | | Same |
| W09 | 4 | 216 | | Same |
| W10 | 4 | 90 | | Below |
| W10 | 2 | 69 | | Below |
| W10 | 4 | 117 | | Same |
| W10 | 4 | 217 | | Same |
| W11 | 4 | 100 | | Below |
| W11 | 2 | 99 | | Below |
| W11 | 3 | 218 | | Same |
| W11 | 4 | 100 | | Same |
| W12 | 4 | 44 | | Below |
| W12 | 2 | 223 | | Same |
| W12 | 4 | 169 | | Same |
| W13 | 4 | 45 | | Below |
| W13 | 2 | 46 | | Below |
| W13 | 4 | 224 | | Same |
| W14 | 4 | 46 | | Below |
| W14 | 2 | 47 | | Below |
| W14 | 3 | 225 | | Same |
| W14 | 4 | 139 | | Same |
| W14 | 4 | 140 | | Same |
| W15 | 2 | 226 | | Below |
| W15 | 4 | 173 | | Same |
| W15 | 3 | 226 | | Same |
| W16 | 4 | 96 | | Below |
| W16 | 2 | 95 | | Below |
| W16 | 4 | 213 | | Same |
| W17 | 4 | 96 | | Below |
| W17 | 2 | 97 | | Below |
| W17 | 4 | 228 | | Same |
| W18 | 4 | 110 | | Same |
| W18 | 1 | 110 | | Below |
| W18 | 2 | 2 | | Below |

Table 17 - Wall Bay (continued)

| Label | NumPoints | PointNumber | PointID | PointType |
|-------|-----------|-------------|---------|-----------|
| W05 | 2 | 158 | | Below |
| W05 | 3 | 92 | | Same |
| W05 | 4 | 91 | | Same |
| W05 | 2 | 69 | | Below |
| W05 | 3 | 115 | | Same |
| W05 | 4 | 205 | | Same |
| W07 | 4 | 93 | | Below |
| W07 | 2 | 228 | | Below |
| W07 | 4 | 173 | | Same |
| W08 | 4 | 96 | | Below |
| W08 | 2 | 227 | | Below |
| W08 | 3 | 95 | | Same |
| W08 | 4 | 213 | | Same |
| W09 | 4 | 16 | | Below |
| W09 | 2 | 220 | | Same |
| W09 | 3 | 168 | | Same |
| W10 | 4 | 2 | | Below |
| W10 | 2 | 102 | | Below |
| W10 | 4 | 104 | | Same |
| W11 | 4 | 21 | | Below |
| W11 | 2 | 20 | | Below |
| W11 | 3 | 219 | | Same |
| W11 | 4 | 115 | | Same |
| W12 | 2 | 229 | | Below |
| W12 | 3 | 97 | | Same |
| W12 | 4 | 110 | | Same |
| W13 | 4 | 37 | | Below |
| W13 | 2 | 38 | | Below |
| W13 | 4 | 188 | | Same |
| W14 | 4 | 53 | | Below |
| W14 | 2 | 52 | | Below |
| W14 | 3 | 106 | | Same |
| W14 | 4 | 107 | | Same |
| W15 | 2 | 99 | | Below |
| W15 | 3 | 123 | | Same |
| W15 | 4 | 214 | | Same |
| W16 | 4 | 2 | | Below |
| W16 | 1 | 1 | | Below |
| W16 | 2 | 1 | | Same |
| W16 | 3 | 59 | | Same |

Table 17 - Wall Bay (continued)

| Label | NumPoints | PointNumber | PointID | PointType |
|-------|-----------|-------------|---------|-----------|
| W18 | 2 | 3 | | Below |
| W18 | 3 | 3 | | Same |
| W18 | 4 | 2 | | Same |
| W18 | 4 | 2 | | Same |
| W19 | 2 | 6 | | Below |
| W19 | 3 | 7 | | Same |
| W19 | 4 | 6 | | Same |
| W20 | 4 | 1 | | Below |
| W20 | 2 | 18 | | Below |
| W20 | 4 | 19 | | Same |
| W20 | 4 | 19 | | Same |
| W21 | 4 | 21 | | Below |
| W21 | 2 | 20 | | Below |
| W21 | 3 | 219 | | Same |
| W21 | 4 | 21 | | Same |
| W22 | 4 | 21 | | Same |
| W22 | 2 | 22 | | Same |
| W22 | 3 | 22 | | Same |
| W23 | 4 | 23 | | Same |
| W23 | 4 | 26 | | Below |
| W23 | 2 | 27 | | Below |
| W23 | 4 | 27 | | Same |
| W23 | 4 | 28 | | Same |
| W24 | 4 | 27 | | Below |
| W24 | 2 | 28 | | Below |
| W24 | 3 | 28 | | Same |
| W24 | 4 | 26 | | Same |
| W24 | 4 | 26 | | Same |
| W25 | 4 | 29 | | Below |
| W25 | 2 | 29 | | Below |
| W25 | 3 | 29 | | Same |
| W26 | 4 | 27 | | Below |
| W26 | 2 | 26 | | Below |
| W26 | 4 | 132 | | Same |
| W26 | 4 | 131 | | Same |
| W27 | 4 | 32 | | Below |
| W27 | 1 | 32 | | Below |
| W27 | 2 | 33 | | Same |
| W27 | 3 | 33 | | Same |
| W27 | 4 | 32 | | Same |
| W28 | 4 | 34 | | Same |
| W28 | 2 | 34 | | Same |
| W28 | 4 | 34 | | Same |
| W29 | 4 | 35 | | Same |
| W29 | 3 | 35 | | Same |
| W29 | 4 | 36 | | Below |
| W29 | 2 | 36 | | Below |
| W29 | 3 | 36 | | Same |

Table 17 - Wall Bay (continued)

| Label | Number/Point | PointNumber | PointQty | PointQty |
|-------|--------------|-------------|----------|----------|
| WT01 | 3 | 54 | Below | |
| WT01 | 4 | 108 | Same | |
| WT02 | 2 | 54 | Below | |
| WT02 | 3 | 54 | Same | |
| WT02 | 4 | 149 | Below | |
| WT03 | 1 | 48 | Below | |
| WT03 | 2 | 47 | Below | |
| WT03 | 3 | 130 | Below | |
| WT04 | 4 | 86 | Below | |
| WT04 | 1 | 51 | Below | |
| WT04 | 2 | 152 | Same | |
| WT04 | 3 | 152 | Same | |
| WT05 | 4 | 51 | Below | |
| WT05 | 2 | 51 | Below | |
| WT05 | 3 | 52 | Below | |
| WT06 | 4 | 52 | Below | |
| WT06 | 1 | 53 | Below | |
| WT06 | 2 | 52 | Below | |
| WT06 | 3 | 53 | Below | |
| WT07 | 4 | 24 | Below | |
| WT07 | 1 | 153 | Below | |
| WT07 | 2 | 29 | Below | |
| WT08 | 4 | 29 | Below | |
| WT08 | 1 | 131 | Below | |
| WT08 | 2 | 131 | Below | |
| WT08 | 3 | 154 | Below | |
| WT09 | 4 | 26 | Below | |
| WT09 | 2 | 29 | Below | |
| WT09 | 3 | 152 | Below | |
| WT10 | 4 | 1 | Below | |
| WT10 | 1 | 31 | Below | |
| WT10 | 2 | 30 | Below | |
| WT10 | 3 | 133 | Below | |
| WT10 | 4 | 136 | Below | |
| WT11 | 4 | 2 | Below | |
| WT11 | 1 | 57 | Below | |
| WT11 | 2 | 57 | Below | |
| WT11 | 3 | 57 | Below | |
| WT12 | 4 | 4 | Below | |
| WT12 | 1 | 66 | Below | |
| WT12 | 2 | 69 | Below | |
| WT12 | 3 | 2 | Below | |

Table 17 - Wall Bay (continued)

| Label | Number/Point | PointNumber | PointQty | PointQty |
|-------|--------------|-------------|----------|----------|
| WT12 | 4 | 205 | Below | |
| WT13 | 4 | 75 | Below | |
| WT13 | 1 | 75 | Below | |
| WT13 | 2 | 76 | Below | |
| WT13 | 3 | 76 | Below | |
| WT14 | 4 | 76 | Below | |
| WT14 | 1 | 76 | Below | |
| WT14 | 2 | 77 | Below | |
| WT14 | 3 | 136 | Below | |
| WT14 | 4 | 139 | Below | |
| WT15 | 4 | 78 | Below | |
| WT15 | 1 | 160 | Below | |
| WT15 | 2 | 160 | Below | |
| WT15 | 3 | 161 | Below | |
| WT16 | 4 | 81 | Below | |
| WT16 | 1 | 80 | Below | |
| WT16 | 2 | 80 | Below | |
| WT16 | 3 | 162 | Below | |
| WT17 | 4 | 71 | Below | |
| WT17 | 1 | 71 | Below | |
| WT17 | 2 | 70 | Below | |
| WT17 | 3 | 221 | Below | |
| WT17 | 4 | 71 | Below | |
| WT18 | 4 | 72 | Below | |
| WT18 | 1 | 72 | Below | |
| WT18 | 2 | 73 | Below | |
| WT18 | 3 | 73 | Below | |
| WT19 | 4 | 76 | Below | |
| WT19 | 1 | 77 | Below | |
| WT19 | 2 | 76 | Below | |
| WT19 | 3 | 76 | Below | |
| WT20 | 4 | 78 | Below | |
| WT20 | 1 | 78 | Below | |
| WT20 | 2 | 77 | Below | |
| WT20 | 3 | 77 | Below | |
| WT20 | 4 | 78 | Below | |
| WT21 | 4 | 78 | Below | |
| WT21 | 1 | 78 | Below | |
| WT21 | 2 | 76 | Below | |
| WT21 | 3 | 76 | Below | |
| WT22 | 4 | 79 | Below | |
| WT22 | 1 | 83 | Below | |
| WT22 | 2 | 82 | Below | |
| WT22 | 3 | 82 | Below | |
| WT22 | 4 | 83 | Below | |
| WT23 | 4 | 84 | Below | |
| WT23 | 1 | 84 | Below | |
| WT23 | 2 | 85 | Below | |
| WT23 | 3 | 85 | Below | |
| WT23 | 4 | 84 | Below | |
| WT24 | 4 | 84 | Below | |
| WT24 | 1 | 84 | Below | |
| WT24 | 2 | 84 | Below | |
| WT24 | 3 | 84 | Below | |
| WT24 | 4 | 84 | Below | |

Table 17 - Wall Bay (continued)

| Label | Number/Point | PointNumber | PointQty | PointQty |
|-------|--------------|-------------|----------|----------|
| WT24 | 3 | 51 | Below | |
| WT24 | 4 | 88 | Below | |
| WT25 | 4 | 87 | Below | |
| WT25 | 2 | 87 | Below | |
| WT25 | 3 | 87 | Below | |
| WT25 | 4 | 88 | Below | |
| WT26 | 4 | 90 | Below | |
| WT26 | 1 | 89 | Below | |
| WT26 | 2 | 89 | Below | |
| WT26 | 3 | 90 | Below | |
| WT26 | 4 | 90 | Below | |
| WT27 | 4 | 91 | Below | |
| WT27 | 1 | 91 | Below | |
| WT27 | 2 | 92 | Below | |
| WT27 | 3 | 92 | Below | |
| WT27 | 4 | 91 | Below | |
| WT28 | 4 | 94 | Below | |
| WT28 | 1 | 94 | Below | |
| WT28 | 2 | 94 | Below | |
| WT28 | 3 | 94 | Below | |
| WT28 | 4 | 173 | Below | |
| WT29 | 4 | 96 | Below | |
| WT29 | 1 | 96 | Below | |
| WT29 | 2 | 96 | Below | |
| WT29 | 3 | 96 | Below | |
| WT29 | 4 | 213 | Below | |
| WT30 | 4 | 97 | Below | |
| WT30 | 1 | 97 | Below | |
| WT30 | 2 | 97 | Below | |
| WT30 | 3 | 97 | Below | |
| WT30 | 4 | 170 | Below | |

Table 1.3 - Mass Source Definition

| Name | Is Lateral Vertical Mass? | Include Lump Mass? | Source Mass? | Source Added Mass? | Source Pattern? | Source Mass? | Source Pattern? | More Load Pattern? | Load Multiplier |
|--------|---------------------------|--------------------|--------------|--------------------|-----------------|--------------|-----------------|--------------------|-----------------|
| MASCT | Yes | No | Yes | No | Yes | No | Yes | No | Multip |
| Shy1 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy2 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy3 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy4 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy5 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy6 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy7 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy8 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy9 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy10 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy11 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy12 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy13 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy14 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy15 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy16 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy17 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy18 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy19 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy20 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy21 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy22 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy23 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy24 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy25 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy26 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy27 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy28 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy29 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy30 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy31 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy32 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy33 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy34 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy35 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy36 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy37 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy38 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy39 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy40 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy41 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy42 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy43 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy44 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy45 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy46 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy47 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy48 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy49 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy50 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy51 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy52 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy53 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy54 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy55 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy56 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy57 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy58 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy59 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy60 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy61 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy62 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy63 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy64 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy65 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy66 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy67 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy68 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy69 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy70 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy71 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy72 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy73 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy74 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy75 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy76 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy77 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy78 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy79 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy80 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy81 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy82 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy83 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy84 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy85 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy86 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy87 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy88 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy89 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy90 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy91 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy92 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy93 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy94 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy95 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy96 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy97 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy98 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy99 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |
| Shy100 | Yes | No | Yes | No | Yes | No | Yes | No | 1 |

Table 1.3 - Mass Source Definition

Table 1.4 - Mass Summary by Story

| Story | UX | UY | UZ |
|-------|----------|----------|----|
| kg | kg | kg | kg |
| Shy1 | 15836.77 | 15836.77 | 0 |
| Shy2 | 21262.2 | | |

Table 24 - Reinforcing Bar Size (Continued)

| Name | Diameter mm | Area cm ² |
|------|----------------|-------------------------|
| #3 | 9.5 | 0.7 |
| #4 | 12.5 | 1.2 |
| #6 | 19.3 | 2.9 |
| #7 | 22.2 | 3.9 |
| #8 | 25.4 | 5.1 |
| #9 | 28.7 | 6.5 |
| #10 | 31.8 | 8.1 |
| #11 | 35.3 | 10.1 |
| #14 | 43 | 14.5 |
| #18 | 57.3 | 25.8 |

2.3.1 Links

Table 25 - Link Property Definitions - Summary

| Name | Type | Diameter mm | Mass kg | Weight kN | Defined m | Default m |
|-------|--------|----------------|------------|--------------|--------------|--------------|
| Link1 | Linker | L1 | 0 | 0 | 0.001 | 0 |

2.3.2 Tendon Sections

Table 26 - Tendon Section Properties

| Name | Material | Strand/cz | Color | Notes |
|---------|----------|-----------|-------|-------|
| Tendon1 | A416/270 | 1 | Gray | |

3 Assignments

This chapter provides a listing of the assignments applied to the model.

3.1 Joint Assignments

Table 31 - Joint Assignments - Summary

| Story | Label | Uniqueness | Diaphragm | Restraints |
|----------|-------|------------|-----------|------------|
| Story 1 | 077 | | From Mass | |
| Story 2 | 086 | | From Mass | |
| Story 3 | 786 | | From Mass | |
| Story 6 | 686 | | From Mass | |
| Story 7 | 771 | | From Mass | |
| Story 8 | 674 | | From Mass | |
| Story 10 | 072 | | From Mass | |
| Story 11 | 772 | | From Mass | |
| Story 13 | 773 | | From Mass | |
| Story 14 | 715 | | From Mass | |
| Story 15 | 729 | | From Mass | |
| Story 19 | 706 | | From Mass | |
| Story 21 | 770 | | From Mass | |
| Story 22 | 776 | | From Mass | |
| Story 23 | 784 | | From Mass | |
| Story 25 | 673 | | From Mass | |
| Story 26 | 689 | | From Mass | |
| Story 27 | 688 | | From Mass | |
| Story 28 | 931 | | From Mass | |
| Story 29 | 773 | | From Mass | |
| Story 30 | 723 | | From Mass | |
| Story 33 | 727 | | From Mass | |
| Story 34 | 689 | | From Mass | |
| Story 35 | 764 | | From Mass | |
| Story 36 | 782 | | From Mass | |
| Story 37 | 711 | | From Mass | |
| Story 38 | 711 | | From Mass | |
| Story 39 | 785 | | From Mass | |
| Story 40 | 786 | | From Mass | |
| Story 41 | 762 | | From Mass | |
| Story 42 | 718 | | From Mass | |
| Story 43 | 718 | | From Mass | |
| Story 45 | 726 | | From Mass | |
| Story 47 | 724 | | From Mass | |
| Story 49 | 683 | | From Mass | |
| Story 51 | 678 | | From Mass | |
| Story 52 | 697 | | From Mass | |
| Story 53 | 781 | | From Mass | |
| Story 56 | 686 | | From Mass | |
| Story 57 | 784 | | From Mass | |
| Story 58 | 732 | | From Mass | |

Table 31 - Joint Assignments - Summary (Continued)

| Story | Label | Uniqueness | Diaphragm | Restraints |
|-----------|-------|------------|-----------|------------|
| Story 60 | 733 | | From Mass | |
| Story 62 | 747 | | From Mass | |
| Story 63 | 786 | | From Mass | |
| Story 64 | 787 | | From Mass | |
| Story 66 | 787 | | From Mass | |
| Story 69 | 737 | | From Mass | |
| Story 71 | 803 | | From Mass | |
| Story 72 | 740 | | From Mass | |
| Story 73 | 770 | | From Mass | |
| Story 76 | 670 | | From Mass | |
| Story 78 | 701 | | From Mass | |
| Story 79 | 805 | | From Mass | |
| Story 82 | 754 | | From Mass | |
| Story 84 | 700 | | From Mass | |
| Story 85 | 868 | | From Mass | |
| Story 86 | 735 | | From Mass | |
| Story 87 | 744 | | From Mass | |
| Story 88 | 743 | | From Mass | |
| Story 90 | 810 | | From Mass | |
| Story 91 | 764 | | From Mass | |
| Story 92 | 749 | | From Mass | |
| Story 94 | 812 | | From Mass | |
| Story 95 | 757 | | From Mass | |
| Story 97 | 801 | | From Mass | |
| Story 100 | 681 | | From Mass | |
| Story 103 | 740 | | From Mass | |
| Story 108 | 791 | | From Mass | |
| Story 133 | 765 | | From Mass | |
| Story 138 | 766 | | From Mass | |
| Story 143 | 678 | | From Mass | |
| Story 148 | 679 | | From Mass | |
| Story 153 | 688 | | From Mass | |
| Story 156 | 722 | | From Mass | |
| Story 162 | 752 | | From Mass | |
| Story 171 | 665 | | From Mass | |
| Story 177 | 686 | | From Mass | |
| Story 180 | 689 | | From Mass | |
| Story 181 | 690 | | From Mass | |
| Story 182 | 691 | | From Mass | |

Table 31 - Joint Assignments - Summary (Continued)

| Story | Label | Uniqueness | Diaphragm | Restraints |
|-----------|-------|------------|-----------|------------|
| Story 184 | 693 | | From Mass | |
| Story 185 | 707 | | From Mass | |
| Story 186 | 726 | | From Mass | |
| Story 187 | 777 | | From Mass | |
| Story 189 | 710 | | From Mass | |
| Story 203 | 736 | | From Mass | |
| Story 204 | 756 | | From Mass | |
| Story 205 | 741 | | From Mass | |
| Story 207 | 742 | | From Mass | |
| Story 213 | 751 | | From Mass | |
| Story 111 | 682 | | From Mass | |
| Story 112 | 684 | | From Mass | |
| Story 113 | 688 | | From Mass | |
| Story 114 | 682 | | From Mass | |
| Story 120 | 687 | | From Mass | |
| Story 130 | 730 | | From Mass | |
| Story 138 | 730 | | From Mass | |
| Story 139 | 716 | | From Mass | |
| Story 165 | 719 | | From Mass | |
| Story 168 | 783 | | From Mass | |
| Story 170 | 747 | | From Mass | |
| Story 173 | 748 | | From Mass | |
| Story 188 | 785 | | From Mass | |
| Story 189 | 738 | | From Mass | |
| Story 218 | 712 | | From Mass | |
| Story 220 | 728 | | From Mass | |
| Story 221 | 745 | | From Mass | |
| Story 222 | 759 | | From Mass | |
| Story 229 | 720 | | From Mass | |
| Story 1 | 528 | | From Mass | |
| Story 2 | 529 | | From Mass | |
| Story 3 | 619 | | From Mass | |
| Story 4 | 770 | | From Mass | |
| Story 5 | 789 | | From Mass | |
| Story 6 | 646 | | From Mass | |
| Story 7 | 622 | | From Mass | |
| Story 8 | 722 | | From Mass | |
| Story 9 | 772 | | From Mass | |
| Story 10 | 526 | | From Mass | |
| Story 11 | 523 | | From Mass | |
| Story 12 | 625 | | From Mass | |
| Story 13 | 624 | | From Mass | |
| Story 14 | 580 | | From Mass | |

Table 31 - Joint Assignments - Summary (Continued)

| Story | Label | Uniqueness | Diaphragm | Restraints |
|----------|-------|------------|-----------|------------|
| Story 15 | 580 | | From Mass | |
| Story 16 | 776 | | From Mass | |
| Story 17 | 775 | | From Mass | |
| Story 18 | 527 | | From Mass | |
| Story 19 | 627 | | From Mass | |
| Story 20 | 778 | | From Mass | |
| Story 21 | 630 | | From Mass | |
| Story 22 | 599 | | From Mass | |
| Story 23 | 585 | | From Mass | |
| Story 24 | 524 | | From Mass | |
| Story 26 | 520 | | From Mass | |
| Story 27 | 549 | | From Mass | |
| Story 28 | 632 | | From Mass | |
| Story 29 | 572 | | From Mass | |
| Story 30 | 782 | | From Mass | |
| Story 31 | 782 | | From Mass | |
| Story 32 | 574 | | From Mass | |
| Story 33 | 578 | | From Mass | |
| Story 34 | 550 | | From Mass | |
| Story 35 | 625 | | From Mass | |
| Story 36 | 523 | | From Mass | |
| Story 37 | 565 | | From Mass | |
| Story 38 | 562 | | From Mass | |
| Story 39 | 636 | | From Mass | |
| Story 40 | 637 | | From Mass | |
| Story 41 | 613 | | From Mass | |
| Story 42 | 611 | | From Mass | |
| Story 43 | 787 | | From Mass | |
| Story 44 | 639 | | From Mass | |
| Story 45 | 577 | | From Mass | |
| Story 46 | 789 | | From Mass | |
| Story 47 | 575 | | From Mass | |
| Story 48 | 524 | | From Mass | |
| Story 49 | 524 | | From Mass | |
| Story 50 | 815 | | From Mass | |
| Story 51 | 548 | | From Mass | |
| Story 52 | 548 | | From Mass | |
| Story 53 | 642 | | From Mass | |
| Story 54 | 782 | | From Mass | |
| Story 55 | 782 | | From Mass | |
| Story 56 | 647 | | From Mass | |
| Story 57 | 645 | | From Mass | |
| Story 58 | 583 | | From Mass | |
| Story 59 | 795 | | From Mass | |
| Story 60 | 584 | | From Mass | |

Table 31 - Joint Assignments - Summary (Continued)

| Story | Label | Uniqueness | Diaphragm | Restraints |
|-----------|-------|------------|-----------|------------|
| Story 62 | 648 | | From Mass | |
| Story 63 | 649 | | From Mass | |
| Story 64 | 618 | | From Mass | |
| Story 66 | 800 | | From Mass | |
| Story 67 | 799 | | From Mass | |
| Story 68 | 801 | | From Mass | |
| Story 69 | 808 | | From Mass | |
| Story 70 | 654 | | From Mass | |
| Story 71 | 654 | | From Mass | |
| Story 72 | 591 | | From Mass | |
| Story 73 | 597 | | From Mass | |
| Story 74 | 604 | | From Mass | |
| Story 75 | 542 | | From Mass | |
| Story 76 | 542 | | From Mass | |
| Story 77 | 522 | | From Mass | |
| Story 78 | 666 | | From Mass | |
| Story 79 | 604 | | From Mass | |
| Story 80 | 607 | | From Mass | |
| Story 81 | 606 | | From Mass | |
| Story 82 | 609 | | From Mass | |
| Story 83 | 609 | | From Mass | |
| Story 84 | 551 | | From Mass | |
| Story 85 | 659 | | From Mass | |
| Story 86 | 586 | | From Mass | |
| Story 87 | 650 | | From Mass | |
| Story 88 | 660 | | From Mass | |
| Story 89 | 660 | | From Mass | |
| Story 90 | 661 | | From Mass | |
| Story 91 | 615 | | From Mass | |
| Story 92 | 600 | | From Mass | |
| Story 93 | 811 | | From Mass | |
| Story 94 | 811 | | From Mass | |
| Story 95 | 816 | | From Mass | |
| Story 96 | 816 | | From Mass | |
| Story 97 | 816 | | From Mass | |
| Story 98 | 612 | | From Mass | |
| Story 99 | 612 | | From Mass | |
| Story 100 | 611 | | From Mass | |
| Story 103 | 616 | | From Mass | |
| Story 133 | 617 | | From Mass | |
| Story 142 | 624 | | From Mass | |
| Story 143 | 627 | | From Mass | |

Table 31 - Joint Assignments - Summary (continued)

| Story | Label | UnblockName | Deployment | Restraints |
|-----------|-------|-------------|------------|------------|
| Story 148 | | 585 | From Main | |
| Story 149 | | 520 | From Main | |
| Story 153 | | 519 | From Main | |
| Story 157 | | 521 | From Main | |
| Story 159 | | 622 | From Main | |
| Story 162 | | 603 | From Main | |
| Story 171 | | 536 | From Main | |
| Story 177 | | 537 | From Main | |
| Story 180 | | 540 | From Main | |
| Story 182 | | 542 | From Main | |
| Story 184 | | 544 | From Main | |
| Story 185 | | 506 | From Main | |
| Story 186 | | 576 | From Main | |
| Story 191 | | 580 | From Main | |
| Story 192 | | 581 | From Main | |
| Story 200 | | 590 | From Main | |
| Story 204 | | 607 | From Main | |
| Story 205 | | 592 | From Main | |
| Story 207 | | 593 | From Main | |
| Story 211 | | 601 | From Main | |
| Story 212 | | 533 | From Main | |
| Story 112 | | 535 | From Main | |
| Story 113 | | 539 | From Main | |
| Story 114 | | 543 | From Main | |
| Story 119 | | 531 | From Main | |
| Story 120 | | 532 | From Main | |
| Story 128 | | 581 | From Main | |
| Story 130 | | 567 | From Main | |
| Story 145 | | 570 | From Main | |
| Story 160 | | 614 | From Main | |
| Story 169 | | 588 | From Main | |
| Story 172 | | 599 | From Main | |
| Story 188 | | 566 | From Main | |
| Story 189 | | 599 | From Main | |
| Story 218 | | 583 | From Main | |
| Story 219 | | 564 | From Main | |
| Story 221 | | 598 | From Main | |
| Story 222 | | 610 | From Main | |
| Story 229 | | 571 | From Main | |
| Story 1 | | 379 | From Main | |
| Story 2 | | 396 | From Main | |
| Story 3 | | 470 | From Main | |

Table 31 - Joint Assignments - Summary (continued)

| Story | Label | UnblockName | Deployment | Restraints |
|----------|-------|-------------|------------|------------|
| Story 4 | | 621 | From Main | |
| Story 5 | | 620 | From Main | |
| Story 6 | | 397 | From Main | |
| Story 7 | | 473 | From Main | |
| Story 8 | | 376 | From Main | |
| Story 9 | | 623 | From Main | |
| Story 10 | | 377 | From Main | |
| Story 11 | | 374 | From Main | |
| Story 12 | | 476 | From Main | |
| Story 13 | | 477 | From Main | |
| Story 14 | | 417 | From Main | |
| Story 15 | | 431 | From Main | |
| Story 16 | | 627 | From Main | |
| Story 17 | | 626 | From Main | |
| Story 18 | | 628 | From Main | |
| Story 19 | | 474 | From Main | |
| Story 20 | | 629 | From Main | |
| Story 21 | | 481 | From Main | |
| Story 22 | | 410 | From Main | |
| Story 23 | | 406 | From Main | |
| Story 24 | | 531 | From Main | |
| Story 25 | | 371 | From Main | |
| Story 27 | | 440 | From Main | |
| Story 28 | | 483 | From Main | |
| Story 29 | | 423 | From Main | |
| Story 30 | | 624 | From Main | |
| Story 31 | | 480 | From Main | |
| Story 32 | | 425 | From Main | |
| Story 33 | | 429 | From Main | |
| Story 34 | | 401 | From Main | |
| Story 35 | | 486 | From Main | |
| Story 36 | | 404 | From Main | |
| Story 37 | | 413 | From Main | |
| Story 38 | | 413 | From Main | |
| Story 39 | | 487 | From Main | |
| Story 40 | | 488 | From Main | |
| Story 41 | | 484 | From Main | |
| Story 42 | | 420 | From Main | |
| Story 43 | | 420 | From Main | |
| Story 44 | | 480 | From Main | |
| Story 45 | | 428 | From Main | |
| Story 46 | | 640 | From Main | |
| Story 47 | | 426 | From Main | |
| Story 48 | | 641 | From Main | |
| Story 49 | | 380 | From Main | |

Table 31 - Joint Assignments - Summary (continued)

| Story | Label | UnblockName | Deployment | Restraints |
|----------|-------|-------------|------------|------------|
| Story 50 | | 666 | From Main | |
| Story 51 | | 300 | From Main | |
| Story 52 | | 399 | From Main | |
| Story 53 | | 644 | From Main | |
| Story 54 | | 644 | From Main | |
| Story 55 | | 643 | From Main | |
| Story 56 | | 398 | From Main | |
| Story 57 | | 486 | From Main | |
| Story 58 | | 624 | From Main | |
| Story 59 | | 475 | From Main | |
| Story 60 | | 425 | From Main | |
| Story 61 | | 647 | From Main | |
| Story 62 | | 499 | From Main | |
| Story 63 | | 500 | From Main | |
| Story 64 | | 448 | From Main | |
| Story 65 | | 651 | From Main | |
| Story 66 | | 651 | From Main | |
| Story 67 | | 650 | From Main | |
| Story 68 | | 652 | From Main | |
| Story 69 | | 659 | From Main | |
| Story 70 | | 653 | From Main | |
| Story 71 | | 442 | From Main | |
| Story 72 | | 442 | From Main | |
| Story 73 | | 438 | From Main | |
| Story 74 | | 655 | From Main | |
| Story 75 | | 433 | From Main | |
| Story 76 | | 372 | From Main | |
| Story 77 | | 507 | From Main | |
| Story 78 | | 507 | From Main | |
| Story 79 | | 445 | From Main | |
| Story 80 | | 656 | From Main | |
| Story 81 | | 657 | From Main | |
| Story 82 | | 486 | From Main | |
| Story 83 | | 482 | From Main | |
| Story 84 | | 510 | From Main | |
| Story 85 | | 437 | From Main | |
| Story 86 | | 446 | From Main | |
| Story 87 | | 446 | From Main | |
| Story 88 | | 445 | From Main | |
| Story 89 | | 512 | From Main | |
| Story 90 | | 466 | From Main | |
| Story 91 | | 465 | From Main | |
| Story 92 | | 451 | From Main | |
| Story 93 | | 642 | From Main | |
| Story 94 | | 514 | From Main | |
| Story 95 | | 459 | From Main | |

Table 31 - Joint Assignments - Summary (continued)

| Story | Label | UnblockName | Deployment | Restraints |
|-----------|-------|-------------|------------|------------|
| Story 96 | | 664 | From Main | |
| Story 97 | | 447 | From Main | |
| Story 98 | | 665 | From Main | |
| Story 99 | | 665 | From Main | |
| Story 100 | | 383 | From Main | |
| Story 103 | | 462 | From Main | |
| Story 108 | | 463 | From Main | |
| Story 133 | | 467 | From Main | |
| Story 138 | | 468 | From Main | |
| Story 143 | | 378 | From Main | |
| Story 149 | | 381 | From Main | |
| Story 153 | | 370 | From Main | |
| Story 156 | | 424 | From Main | |
| Story 162 | | 454 | From Main | |
| Story 171 | | 387 | From Main | |
| Story 177 | | 388 | From Main | |
| Story 180 | | 391 | From Main | |
| Story 181 | | 392 | From Main | |
| Story 184 | | 395 | From Main | |
| Story 185 | | 469 | From Main | |
| Story 186 | | 427 | From Main | |
| Story 189 | | 411 | From Main | |
| Story 193 | | 412 | From Main | |
| Story 204 | | 458 | From Main | |
| Story 207 | | 444 | From Main | |
| Story 211 | | 452 | From Main | |
| Story 213 | | 453 | From Main | |
| Story 214 | | 394 | From Main | |
| Story 219 | | 382 | From Main | |
| Story 220 | | 389 | From Main | |
| Story 221 | | 416 | From Main | |
| Story 222 | | 418 | From Main | |
| Story 229 | | 465 | From Main | |
| Story 169 | | 419 | From Main | |
| Story 170 | | 449 | From Main | |
| Story 173 | | 450 | From Main | |

Table 3.3 Axis Assignments - Summary (Continued)

| Story | Label | Uniqueness | Section | Property |
|-----------|-------|------------|---------|----------|
| Story F86 | F86 | 98 | P/CA/12 | Slab |
| Story F87 | F87 | 99 | P/CA/12 | Slab |
| Story F88 | F88 | 100 | P/CA/12 | Slab |
| Story F89 | F89 | 101 | P/CA/12 | Slab |
| Story F90 | F90 | 102 | P/CA/12 | Slab |
| Story F91 | F91 | 103 | P/CA/12 | Slab |
| Story F92 | F92 | 104 | P/CA/12 | Slab |
| Story F93 | F93 | 105 | P/CA/12 | Slab |
| Story F94 | F94 | 106 | P/CA/12 | Slab |
| Story F95 | F95 | 107 | P/CA/12 | Slab |
| Story F96 | F96 | 108 | P/CA/12 | Slab |
| Story F97 | F97 | 109 | P/CA/12 | Slab |
| Story F98 | F98 | 110 | P/CA/12 | Slab |
| Story W6 | W6 | 7 | M/RO/12 | Wall |
| Story W7 | W7 | 8 | M/RO/12 | Wall |
| Story W8 | W8 | 9 | M/RO/12 | Wall |
| Story W9 | W9 | 10 | M/RO/12 | Wall |
| Story W10 | W10 | 11 | M/RO/12 | Wall |
| Story W11 | W11 | 12 | M/RO/12 | Wall |
| Story W12 | W12 | 13 | M/RO/12 | Wall |
| Story W13 | W13 | 14 | M/RO/12 | Wall |
| Story W14 | W14 | 15 | M/RO/12 | Wall |
| Story W15 | W15 | 16 | M/RO/12 | Wall |
| Story W16 | W16 | 17 | M/RO/12 | Wall |
| Story W17 | W17 | 18 | M/RO/12 | Wall |
| Story W18 | W18 | 19 | M/RO/12 | Wall |
| Story W19 | W19 | 20 | M/RO/12 | Wall |

4 Loads

This chapter provides loading information as applied to the model.

4.1 Load Patterns

Table 4.1 Load Pattern Definitions

| Name | Is Auto Load | Is Auto Type Multiplier | Slab Auto Load |
|-------------|--------------|-------------------------|----------------|
| -LRF | Yes | Other | 0 |
| -S/NOVECC | Yes | Other | 0 |
| -S/NOVECC | Yes | Other | 0 |
| Masses | No | Default | 0 |
| Response | No | Response | 0 |
| Shrink/Pile | No | Same | 0 |
| Shrink/Pile | No | Same | 0 |
| Wind | No | Law | 0 |

4.2 Auto Seismic Loading

User Coefficient Auto Seismic Load Calculation

This calculation presents the automatically generated lateral seismic loads for load pattern Shrink/Pile using the user input coefficients, as calculated by ETABS.

Direction and Eccentricity

Direction = X
 Factors and Coefficients
 Equivalent Lateral Forces
 Base Shear Coefficient, C
 Base Shear, V

Calculated Base Shear

| Direction | Period Load (sec) | C | W (kN) | V (kN) |
|-----------|-------------------|---|----------|-----------|
| X | 0 | 0 | 2802.005 | 2103.7645 |

Applied Story Forces

User Coefficient Auto Seismic Load Calculation

This calculation presents the automatically generated lateral seismic loads for load pattern Shrink/Pile using the user input coefficients, as calculated by ETABS.

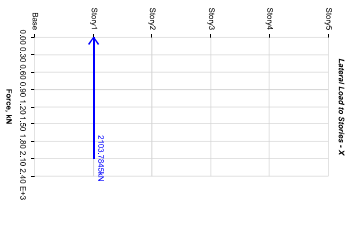
Direction and Eccentricity

Direction = Y
 Factors and Coefficients
 Equivalent Lateral Forces
 Base Shear Coefficient, C
 Base Shear, V

Calculated Base Shear

| Direction | Period Load (sec) | C | W (kN) | V (kN) |
|-----------|-------------------|---|----------|-----------|
| Y | 0 | 0 | 2802.005 | 2103.7645 |

Applied Story Forces



| Story | Elevation (m) | X-Dir (kN) | Y-Dir (kN) |
|--------|---------------|------------|------------|
| Story5 | 15 | 0 | 0 |
| Story4 | 12 | 0 | 0 |
| Story3 | 9 | 0 | 0 |
| Story2 | 6 | 0 | 0 |
| Story1 | 3 | 2103.7645 | 0 |
| Base | 0 | 0 | 0 |

Table 4.4 - Area Load Assignments - Uniform (Continued)

Table with columns: Story, Label, Uniqueness, Pattern, Load Direction, Load Area, Area, Group, Fx, Fy, Fz, Damping Ratio. Rows include Story F12 through Story F20.

Table 4.5 - Area Load Assignments - Uniform (Continued)

Table with columns: Story, Label, Uniqueness, Pattern, Load Direction, Load Area, Area, Group, Fx, Fy, Fz, Damping Ratio. Rows include Story F22 through Story F30.

Table 4.5 - Functions - Response Spectrum - Columbia NSR-10 (continued)

Table with columns: Name, Period, Value, Aa, Av, Ad, Group, Fx, Fy, Fz, Damping Ratio. Rows include ESPECTRO 0.1, 0.2, 0.3, 0.4.

Table 4.4 - Area Load Assignments - Uniform (Continued)

Table with columns: Story, Label, Uniqueness, Pattern, Load Direction, Load Area, Area, Group, Fx, Fy, Fz, Damping Ratio. Rows include Story F12 through Story F20.

Table 4.5 - Functions - Response Spectrum - Columbia NSR-10

Table with columns: Name, Period, Value, Aa, Av, Ad, Group, Fx, Fy, Fz, Damping Ratio. Rows include ESPECTRO 0.1, 0.2, 0.3, 0.4.

Table 4.5 - Functions - Time History - User Defined

Table with columns: Name, Time, Value. Rows include RUMBL, UPRFL, UPRFL.

Table 4.7 - Load Case Definitions - Summary

Table with columns: Name, Type, Description, Response Spectrum. Rows include Mical, Mical-Eigen, Mical-Side, etc.

Table 4.7 - Load Case Definitions - Summary

Table with columns: Name, Type, Description, Response Spectrum. Rows include Mical, Mical-Eigen, Mical-Side, etc.

Table 4.7 - Load Case Definitions - Summary

Table with columns: Name, Type, Description, Response Spectrum. Rows include Mical, Mical-Eigen, Mical-Side, etc.

4.6 Load Combinations

Table 4.8 - Load Combination Definitions

Table with columns: Name, Type, Is Auto, Load Name, SF, Norms. Rows include 1.0D+1.0L, 1.2D+1.0E+0.3E+1.0L, etc.

5 Analysis Results

This chapter provides analysis results.

5.1 Structure Results

Table 5.1 - Base Reactions (Part 2 of 2)

Table with columns: Output Case, Case Type, Ship, FR, FX, FY, FZ, MX, MY, MZ, U, V, W, L, S, M. Rows include 1.2D+1.0E+0.3E+1.0L, etc.

Table 5.1 - Base Reactions (Part 2 of 2)

Table with columns: Story, Output Case, Case Type, Type, Direction, Drift, Label, X, Y, Z. Rows include Story 5, Story 4, Story 3, etc.

Table 5.1 - Base Reactions (Part 2 of 2)

Table with columns: Story, Output Case, Case Type, Type, Direction, Drift, Label, X, Y, Z. Rows include Story 5, Story 4, Story 3, etc.

Table 5.2 - Story Drifts (continued)

Table with columns: Story, Output Case, Case Type, Shear Direction, Drift, Label, X, Y, Z. Rows include stories 1201-1205 and 1207-1210.

Table 5.2 - Story Drifts (continued)

Table with columns: Story, Output Case, Case Type, Shear Direction, Drift, Label, X, Y, Z. Rows include stories 1201-1205 and 1207-1210.

Table 5.2 - Story Drifts (continued)

Table with columns: Story, Output Case, Case Type, Shear Direction, Drift, Label, X, Y, Z. Rows include stories 1201-1205 and 1207-1210.

Table 5.2 - Story Drifts (continued)

Table with columns: Story, Output Case, Case Type, Shear Direction, Drift, Label, X, Y, Z. Rows include stories 1201-1205 and 1207-1210.

Table 5.2 - Story Drifts (continued)

Table with columns: Story, Output Case, Case Type, Shear Direction, Drift, Label, X, Y, Z. Rows include stories 1201-1205 and 1207-1210.

Table 5.2 - Story Drifts (continued)

Table with columns: Story, Output Case, Case Type, Shear Direction, Drift, Label, X, Y, Z. Rows include stories 1201-1205 and 1207-1210.

Table S3.1 - Story Force (Part 1 of 2 continued)

Table with columns: Story, Output Case, Case Type, Step, Location, P, M, Vx, Vy, Vz, T. Rows include EXPOSED, EY CORRECTED, META TOTAL, etc.

Table S4.1 - Story Force (Part 1 of 2 continued)

Table with columns: Story, Output Case, Case Type, Step, Location, P, M, Vx, Vy, Vz, T. Rows include EXPOSED, EY CORRECTED, META TOTAL, etc.

Table S3.1 - Story Force (Part 1 of 2 continued)

Table with columns: Story, Output Case, Case Type, Step, Location, P, M, Vx, Vy, Vz, T. Rows include EXPOSED, EY CORRECTED, META TOTAL, etc.

Table S4.1 - Story Force (Part 1 of 2 continued)

Table with columns: Story, Output Case, Case Type, Step, Location, P, M, Vx, Vy, Vz, T. Rows include EXPOSED, EY CORRECTED, META TOTAL, etc.

Table S3.1 - Story Force (Part 1 of 2 continued)

Table with columns: Story, Output Case, Case Type, Step, Location, P, M, Vx, Vy, Vz, T. Rows include EXPOSED, EY CORRECTED, META TOTAL, etc.

Table S4.1 - Story Force (Part 1 of 2 continued)

Table with columns: Story, Output Case, Case Type, Step, Location, P, M, Vx, Vy, Vz, T. Rows include EXPOSED, EY CORRECTED, META TOTAL, etc.

Table S4.4 - Story Forces (Part 1 of 2, continued)

Table with columns: Story, Output Case, Case Type, Step, Location, P, Vx, Vy, T. Rows include stories 1201-100 and 1201-101.

Table S4.4 - Story Forces (Part 2 of 2)

Summary table with columns: MX, MY, Min, Max. Rows for stories 1201-100 and 1201-101.

Table S4.4 - Story Forces (Part 2 of 2, continued)

Table with columns: MX, MY, Min, Max. Rows for stories 1201-102 through 1201-109.

Table S4.4 - Story Forces (Part 2 of 2, continued)

Table with columns: MX, MY, Min, Max. Rows for stories 1201-110 through 1201-117.

Table S4.4 - Story Forces (Part 2 of 2, continued)

Table with columns: MX, MY, Min, Max. Rows for stories 1201-118 through 1201-125.

Table S4.4 - Story Forces (Part 2 of 2, continued)

Table with columns: MX, MY, Min, Max. Rows for stories 1201-126 through 1201-133.

Table S4.4 - Story Forces (Part 2 of 2, continued)

Table with columns: MX, MY, Min, Max. Rows for stories 1201-134 through 1201-141.

Table S4.1 - Story Forces (Part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ, Min, Max. Rows include Story 1 through Story 7 with various output cases like Pseudo, MERTIA TOTAL, and EX CORRECCO.

S3 Point Results

Table S4.5 - Joint Reactions (Part 1 of 2)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ, Min, Max. Rows include Story 1 through Story 3 with various output cases like Pseudo, MERTIA TOTAL, and EX CORRECCO.

E/FMS YR1910

Table S4.5 - Joint Reactions (Part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ, Min, Max. Rows include Story 4 through Story 14 with various output cases like Pseudo, MERTIA TOTAL, and EX CORRECCO.

E/FMS YR1910

Table S4.5 - Joint Reactions (Part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ, Min, Max. Rows include Story 2 through Story 18 with various output cases like Pseudo, MERTIA TOTAL, and EX CORRECCO.

E/FMS YR1910

Table S4.5 - Joint Reactions (Part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ, Min, Max. Rows include Story 14 through Story 18 with various output cases like Pseudo, MERTIA TOTAL, and EX CORRECCO.

E/FMS YR1910

Table S4.5 - Joint Reactions (Part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ, Min, Max. Rows include Story 3 through Story 10 with various output cases like Pseudo, MERTIA TOTAL, and EX CORRECCO.

E/FMS YR1910

Table S4.5 - Joint Reactions (Part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ, Min, Max. Rows include Story 10 through Story 21 with various output cases like Pseudo, MERTIA TOTAL, and EX CORRECCO.

E/FMS YR1910

Table 53 - Joint Reactions (part 2 of 2 continued)

Table with 12 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include data for various stories and output cases like MERTIA TOTAL, SMOXY FHE, and various DERIV cases.

Table 54 - Joint Reactions (part 2 of 2 continued)

Table with 12 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include data for various stories and output cases like MERTIA TOTAL, SMOXY FHE, and various DERIV cases.

Table 55 - Joint Reactions (part 2 of 2 continued)

Table with 12 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include data for various stories and output cases like MERTIA TOTAL, SMOXY FHE, and various DERIV cases.

Table 56 - Joint Reactions (part 2 of 2 continued)

Table with 12 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include data for various stories and output cases like MERTIA TOTAL, SMOXY FHE, and various DERIV cases.

Table 57 - Joint Reactions (part 2 of 2 continued)

Table with 12 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include data for various stories and output cases like MERTIA TOTAL, SMOXY FHE, and various DERIV cases.

Table 58 - Joint Reactions (part 2 of 2 continued)

Table with 12 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include data for various stories and output cases like MERTIA TOTAL, SMOXY FHE, and various DERIV cases.

Table \$54 - Joint Reactions (part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 21-50 showing joint reaction data for various cases like 1201-10E+3-DE+1-DL, 1201-10E+3-DE+1-L, etc.

Table \$54 - Joint Reactions (part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 51-80 showing joint reaction data for various cases like 1201-10E+3-DE+1-DL, 1201-10E+3-DE+1-L, etc.

Table \$54 - Joint Reactions (part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 81-110 showing joint reaction data for various cases like 1201-10E+3-DE+1-DL, 1201-10E+3-DE+1-L, etc.

Table \$54 - Joint Reactions (part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 111-140 showing joint reaction data for various cases like 1201-10E+3-DE+1-DL, 1201-10E+3-DE+1-L, etc.

Table \$54 - Joint Reactions (part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 141-170 showing joint reaction data for various cases like 1201-10E+3-DE+1-DL, 1201-10E+3-DE+1-L, etc.

Table \$54 - Joint Reactions (part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 171-200 showing joint reaction data for various cases like 1201-10E+3-DE+1-DL, 1201-10E+3-DE+1-L, etc.

Table S5.1 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include data for stories 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

Table S5.1 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include data for stories 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

Table S5.1 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include data for stories 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

Table S5.1 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include data for stories 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

Table S5.1 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include data for stories 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

Table S5.1 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include data for stories 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

Table 53 - Joint Reactions (part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 47-91.

Table 54 - Joint Reactions (part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 92-136.

Table 55 - Joint Reactions (part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 137-181.

Table 56 - Joint Reactions (part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 182-226.

Table 57 - Joint Reactions (part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 227-271.

Table 58 - Joint Reactions (part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 272-316.

Table S5 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include various structural elements like BEAM 54, 55, 110, 111, etc., with their respective reaction values.

Table S5 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include various structural elements like BEAM 59, 118, 119, 120, etc., with their respective reaction values.

Table S5 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include various structural elements like BEAM 56, 113, 114, 115, etc., with their respective reaction values.

Table S5 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include various structural elements like BEAM 61, 122, 123, 124, etc., with their respective reaction values.

Table S5 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include various structural elements like BEAM 57, 114, 115, 116, etc., with their respective reaction values.

Table S5 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include various structural elements like BEAM 63, 126, 127, 128, etc., with their respective reaction values.

Table 53 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Contains data for stories 65-72, including cases like MARIYA TOTAL, EX CORRECCION, and SMOXY FHE.

Table 54 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Contains data for stories 70-76, including cases like SMOXY FHE, MARIYA TOTAL, and EX CORRECCION.

Table 55 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Contains data for stories 72-79, including cases like SMOXY FHE, MARIYA TOTAL, and EX CORRECCION.

Table 56 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Contains data for stories 74-81, including cases like SMOXY FHE, MARIYA TOTAL, and EX CORRECCION.

Table 57 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Contains data for stories 82-89, including cases like SMOXY FHE, MARIYA TOTAL, and EX CORRECCION.

Table 58 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Contains data for stories 90-97, including cases like SMOXY FHE, MARIYA TOTAL, and EX CORRECCION.

Table 53 - Joint Reactions (part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 150-185.

Table 53 - Joint Reactions (part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 186-221.

Table 53 - Joint Reactions (part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 222-257.

Table 53 - Joint Reactions (part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 258-293.

Table 53 - Joint Reactions (part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 294-329.

Table 53 - Joint Reactions (part 2 of 2 continued)

Table with 13 columns: Story, Label, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows 330-365.

Table S3 - Joint Reactions (Part 2 of 2 continued)

| Story | Label | Unique | Output Case | Case Type | Step | FX | FY | FZ | MX | MY | MZ |
|---------|-------|--------|-------------------|-------------|------|----------|--------|----------|--------|--------|--------|
| Beam 06 | 172 | 172 | EX/ISO | Combination | Max | -22.298 | -2.228 | -112.788 | -1.201 | -0.051 | -0.000 |
| Beam 06 | 172 | 172 | EX/ISO | Combination | Min | -42.702 | -0.229 | -98.220 | -0.066 | -0.000 | -0.000 |
| Beam 06 | 172 | 172 | EX/ISO | Combination | Max | 16.243 | 0.128 | 48.689 | 0.846 | 0.000 | 0.000 |
| Beam 06 | 172 | 172 | EX/ISO | Combination | Min | -6.243 | -0.128 | -48.689 | -0.846 | 0.000 | 0.000 |
| Beam 06 | 172 | 172 | 1201+18E+4-3E+1+D | Combination | Max | 94.18 | 0.000 | 198.184 | 0.079 | 0.000 | 0.000 |
| Beam 06 | 172 | 172 | 1201+18E+4-3E+1+D | Combination | Min | -143.899 | -0.000 | -304.104 | -0.114 | -0.000 | -0.000 |
| Beam 06 | 172 | 172 | 1201+18E+4-3E+1+D | Combination | Max | 3.264 | -0.176 | 4.883 | 0.016 | -0.000 | -0.000 |
| Beam 06 | 172 | 172 | 1201+18E+4-3E+1+D | Combination | Min | -3.264 | 0.176 | -4.883 | -0.016 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | Phragm | Combination | Max | 18.278 | -0.044 | 68.082 | -0.029 | -0.000 | -0.000 |
| Beam 07 | 175 | 175 | Phragm | Combination | Min | -15.843 | -0.064 | -70.383 | 0.073 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | Materia | Combination | Max | 12.968 | -0.047 | 14.104 | 0.026 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | Materia | Combination | Min | -14.413 | 0.047 | -14.104 | -0.026 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | Stavox | Combination | Max | 163.396 | 0.384 | 654.320 | 0.947 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | Stavox | Combination | Min | -163.396 | -0.384 | -654.320 | -0.947 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Max | 14.429 | 0.384 | 54.271 | 0.791 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Min | -14.429 | -0.384 | -54.271 | -0.791 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Max | 114.489 | 0.421 | 375.451 | 0.788 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Min | -114.489 | -0.421 | -375.451 | -0.788 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Max | 168.031 | 0.282 | 703.033 | 0.923 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Min | -168.031 | -0.282 | -703.033 | -0.923 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Max | 212.209 | -0.569 | -567.247 | -1.234 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Min | -212.209 | 0.569 | 567.247 | 1.234 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Max | 62.941 | 0.273 | 472.202 | 1.328 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Min | -62.941 | -0.273 | -472.202 | -1.328 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Max | 33.821 | 0.079 | 118.762 | 0.944 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Min | -33.821 | -0.079 | -118.762 | -0.944 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Max | 20.448 | 0.072 | 67.025 | 0.168 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | EX/ISO | Combination | Min | -20.448 | -0.072 | -67.025 | -0.168 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | 1201+18E+4-3E+1+D | Combination | Max | 44.200 | -0.288 | 238.867 | 0.200 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | 1201+18E+4-3E+1+D | Combination | Min | -44.200 | 0.288 | -238.867 | -0.200 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | 1201+18E+4-3E+1+D | Combination | Max | 4.894 | -0.072 | 217.441 | 0.333 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | 1201+18E+4-3E+1+D | Combination | Min | -4.894 | 0.072 | -217.441 | -0.333 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | 1201+18E+4-3E+1+D | Combination | Max | 22.448 | -0.288 | 12.078 | 0.148 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | 1201+18E+4-3E+1+D | Combination | Min | -22.448 | 0.288 | -12.078 | -0.148 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | 1201+18E+4-3E+1+D | Combination | Max | 14.511 | -0.048 | 69.759 | 0.036 | 0.000 | 0.000 |
| Beam 07 | 175 | 175 | 1201+18E+4-3E+1+D | Combination | Min | -14.511 | 0.048 | -69.759 | -0.036 | 0.000 | 0.000 |
| Beam 08 | 178 | 178 | Materia | Combination | Max | 2.844 | -0.207 | 12.504 | 0.248 | 0.000 | 0.000 |
| Beam 08 | 178 | 178 | Materia | Combination | Min | -2.844 | 0.207 | -12.504 | -0.248 | 0.000 | 0.000 |
| Beam 08 | 178 | 178 | Stavox | Combination | Max | -1.866 | 0.181 | -15.386 | 0.166 | 0.000 | 0.000 |
| Beam 08 | 178 | 178 | Stavox | Combination | Min | 1.866 | -0.181 | 15.386 | -0.166 | 0.000 | 0.000 |
| Beam 08 | 178 | 178 | EX/ISO | Combination | Max | 79.444 | 0.340 | 217.412 | 0.142 | 0.000 | 0.000 |
| Beam 08 | 178 | 178 | EX/ISO | Combination | Min | -79.444 | -0.340 | -217.412 | -0.142 | 0.000 | 0.000 |
| Beam 08 | 178 | 178 | EX/ISO | Combination | Max | 30.919 | 0.245 | 229.378 | 0.296 | 0.000 | 0.000 |
| Beam 08 | 178 | 178 | EX/ISO | Combination | Min | -30.919 | -0.245 | -229.378 | -0.296 | 0.000 | 0.000 |
| Beam 08 | 178 | 178 | Materia TOTAL | Combination | Max | 73.864 | -0.070 | 62.539 | 0.644 | 0.000 | 0.000 |
| Beam 08 | 178 | 178 | Materia TOTAL | Combination | Min | -73.864 | 0.070 | -62.539 | -0.644 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 46.344 | -0.273 | 288.174 | 0.244 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -46.344 | 0.273 | -288.174 | -0.244 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 48.994 | -0.072 | 217.441 | 0.333 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -48.994 | 0.072 | -217.441 | -0.333 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 22.448 | -0.288 | 12.078 | 0.148 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -22.448 | 0.288 | -12.078 | -0.148 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 14.511 | -0.048 | 69.759 | 0.036 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -14.511 | 0.048 | -69.759 | -0.036 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 62.941 | 0.273 | 472.202 | 1.328 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -62.941 | -0.273 | -472.202 | -1.328 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 33.821 | 0.079 | 118.762 | 0.944 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -33.821 | -0.079 | -118.762 | -0.944 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 20.448 | 0.072 | 67.025 | 0.168 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -20.448 | -0.072 | -67.025 | -0.168 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Max | 44.200 | -0.288 | 238.867 | 0.200 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Min | -44.200 | 0.288 | -238.867 | -0.200 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Max | 4.894 | -0.072 | 217.441 | 0.333 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Min | -4.894 | 0.072 | -217.441 | -0.333 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Max | 22.448 | -0.288 | 12.078 | 0.148 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Min | -22.448 | 0.288 | -12.078 | -0.148 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Max | 14.511 | -0.048 | 69.759 | 0.036 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Min | -14.511 | 0.048 | -69.759 | -0.036 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 62.941 | 0.273 | 472.202 | 1.328 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -62.941 | -0.273 | -472.202 | -1.328 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 33.821 | 0.079 | 118.762 | 0.944 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -33.821 | -0.079 | -118.762 | -0.944 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 20.448 | 0.072 | 67.025 | 0.168 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -20.448 | -0.072 | -67.025 | -0.168 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Max | 44.200 | -0.288 | 238.867 | 0.200 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Min | -44.200 | 0.288 | -238.867 | -0.200 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Max | 4.894 | -0.072 | 217.441 | 0.333 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Min | -4.894 | 0.072 | -217.441 | -0.333 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Max | 22.448 | -0.288 | 12.078 | 0.148 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Min | -22.448 | 0.288 | -12.078 | -0.148 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Max | 14.511 | -0.048 | 69.759 | 0.036 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Min | -14.511 | 0.048 | -69.759 | -0.036 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 62.941 | 0.273 | 472.202 | 1.328 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -62.941 | -0.273 | -472.202 | -1.328 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 33.821 | 0.079 | 118.762 | 0.944 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -33.821 | -0.079 | -118.762 | -0.944 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Max | 20.448 | 0.072 | 67.025 | 0.168 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | EX/ISO | Combination | Min | -20.448 | -0.072 | -67.025 | -0.168 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Max | 44.200 | -0.288 | 238.867 | 0.200 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Min | -44.200 | 0.288 | -238.867 | -0.200 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Max | 4.894 | -0.072 | 217.441 | 0.333 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Min | -4.894 | 0.072 | -217.441 | -0.333 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Max | 22.448 | -0.288 | 12.078 | 0.148 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Min | -22.448 | 0.288 | -12.078 | -0.148 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Max | 14.511 | -0.048 | 69.759 | 0.036 | 0.000 | 0.000 |
| Beam 09 | 179 | 179 | 1201+18E+4-3E+1+D | Combination | Min | -14.511 | 0.048 | -69.759 | -0.036 | 0.000 | 0.000 |

Table S3 - Joint Reactions (Part 2 of 2 continued)

| Story | Label | Unique | Output Case | Case Type | Step | FX | FY | FZ | MX | MY | MZ |
|---------|-------|--------|-------------|-------------|------|---------|--------|----------|--------|--------|--------|
| Beam 02 | 134 | 134 | Phragm | Combination | Max | -46.134 | 0.041 | 167.714 | -0.222 | -0.000 | -0.000 |
| Beam 02 | 134 | 134 | Phragm | Combination | Min | 46.134 | -0.041 | -167.714 | 0.222 | 0.000 | 0.000 |
| Beam 02 | 134 | 134 | Materia | Combination | Max | -3.841 | 0.039 | -17.328 | -0.035 | 0.000 | 0.000 |
| Beam 02 | 134 | 134 | Materia | Combination | Min | 3.841 | -0.039 | 17.328 | 0.035 | 0.000 | 0.000 |
| Beam 02 | 134 | 134 | Stavox | Combination | Max | -2.713 | 0.198 | 10.804 | 0.244 | 0.000 | 0.0 |

Table 53 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label Name, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include various joint reactions for stories 96-99.

Table 53 - Joint Reactions (Part 2 of 2 continued)

Table with columns: MY, MZ, KX, KY, KZ. Rows include various joint reactions for stories 96-99.

Table 53 - Joint Reactions (Part 2 of 2 continued)

Table with columns: Story, Label Name, Unique, Output Case, Case Type, Step, FX, FY, FZ, MX, MY, MZ. Rows include various joint reactions for stories 100-102.

Table 53 - Joint Reactions (Part 2 of 2 continued)

Table with columns: MY, MZ, KX, KY, KZ. Rows include various joint reactions for stories 100-102.

Table 53 - Joint Reactions (Part 2 of 2)

Table with columns: MY, MZ, KX, KY, KZ. Rows include various joint reactions for stories 103-105.

Table 53 - Joint Reactions (Part 2 of 2 continued)

Table with columns: MY, MZ, KX, KY, KZ. Rows include various joint reactions for stories 103-105.

Table S5+ Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|----------|---------|
| KNm | KNm |
| 7.676 | 0.037 |
| -1.213 | -0.009 |
| 0.8122 | 0.034 |
| -0.0127 | -0.0364 |
| 8.1982 | -0.0156 |
| -6.6972 | -0.0473 |
| -4.366 | 0.01 |
| 0.0028 | -0.0029 |
| 1.0868 | -0.0029 |
| -0.0621 | -0.0319 |
| 0.1884 | -0.0045 |
| 0.322 | -0.0548 |
| -0.0694 | 0.0299 |
| 0.3407 | 0.0399 |
| 0.8441 | -0.0267 |
| 38.8441 | 0.0772 |
| 4.0127 | -1.1883 |
| -6.3717 | -0.0928 |
| 0.0007 | 0.0007 |
| 4.7232 | 0.0814 |
| -4.65163 | -1.1238 |
| 1.3262 | 0.1271 |
| 0.3697 | -0.1896 |
| -4.2907 | -0.0165 |
| 0.0844 | 0.0283 |
| -0.0844 | -0.0283 |
| 9.2823 | -0.0115 |
| -2.3197 | -0.0818 |
| -1.354 | -0.0888 |
| 0.854 | -0.0312 |
| -0.0025 | 0.0018 |
| -0.0022 | 0.0095 |
| -0.0023 | 0.0025 |
| -0.0023 | 0.0025 |
| -0.1726 | 0.0133 |
| -4.848 | 0.3851 |
| 0.0003 | 0.023 |
| -0.0048 | 0.0024 |
| 5.2793 | 0.4621 |
| -0.3783 | -0.4821 |

Table S5+ Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|---------|
| KNm | KNm |
| -1.0922 | -0.0843 |
| 0.1584 | -0.0261 |
| 0.0269 | 0.0015 |
| 0.0991 | 0.0016 |
| -0.0406 | -0.1022 |
| -0.0801 | 0.0092 |
| 0.0097 | 0.0291 |
| 0.2844 | -0.0006 |
| 3.8772 | 0.3857 |
| -3.8772 | -0.3857 |
| 0.0797 | 0.0096 |
| 4.0916 | 0.3793 |
| -4.2968 | -0.3868 |
| 1.357 | 0.0615 |
| -0.0024 | -0.0567 |
| 0.0991 | 0.0798 |
| 0.1726 | 0.0133 |
| 0.175 | 0.0188 |
| -0.115 | -0.0188 |
| 1.1428 | 0.0749 |
| -0.2714 | -0.0733 |
| 0.1318 | -0.0004 |
| 0.1444 | -0.0004 |
| -0.0452 | 0.0004 |
| 0.2369 | -0.003 |
| 0.2006 | 0.0137 |
| 0.3399 | -0.0034 |
| 2.114 | 0.3898 |
| -2.7794 | -0.3899 |
| -2.7794 | -0.3899 |
| -0.2927 | -0.0166 |
| 3.808 | 0.4532 |
| -2.33 | -0.4607 |
| 0.7981 | 0.0729 |
| 0.2626 | -0.0001 |
| 0.962 | 0.0816 |

Table S5+ Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|-----------|-----------|
| KNm | KNm |
| 1.000 | 0.007 |
| -1.000 | -0.007 |
| 5.8713 | 0.4649 |
| -4.8682 | -0.4662 |
| 1.0633 | 0.0235 |
| -1.1072 | -0.0278 |
| 0.9891 | 0.029 |
| -0.9891 | -0.029 |
| 0.1986 | 0.0055 |
| -0.1986 | -0.0055 |
| 1.0472 | 0.0975 |
| -1.063 | -0.0068 |
| 0.6474 | 0.0298 |
| 4.007 | 0.0029 |
| 0.0019 | -0.0007 |
| 1.199E-06 | -3.19E-05 |
| 1.279E-06 | -3.34E-05 |
| -0.8223 | 0.024 |
| 0.8223 | -0.024 |
| 0.2977 | 0.0051 |
| 0.3019 | -0.0008 |
| 4.3573 | 0.4442 |
| -4.3573 | -0.4442 |
| 4.18573 | -0.4442 |
| -4.1857 | 0.4442 |
| 4.3692 | 0.4447 |
| -4.3692 | -0.4447 |
| 0.7008 | 0.0054 |
| -0.6971 | -0.007 |
| 0.6971 | 0.007 |
| 0.1248 | 0.0011 |
| -0.1248 | -0.0011 |
| 0.8178 | 0.0791 |
| -0.8133 | -0.081 |
| 4.396 | -0.026 |
| -4.396 | 0.026 |
| -0.0072 | -0.0008 |
| 0.0072 | 0.0008 |
| 0.0097 | -0.0051 |
| 0.0097 | -0.0051 |
| 7.1298 | -0.004 |

Table S5+ Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|----------|---------|
| KNm | KNm |
| -0.9262 | -0.0916 |
| -0.0433 | -0.003 |
| 1.1134 | 0.0781 |
| 0.0991 | -0.0899 |
| 0.7384 | 0.223 |
| 0.2421 | -0.019 |
| 0.2421 | -0.019 |
| 0.3708 | -0.0003 |
| 0.1144 | -0.0071 |
| 0.1177 | -0.0078 |
| -1.173 | 0.0444 |
| 1.006 | -0.0033 |
| 3.8002 | 0.1806 |
| 0.4646 | -0.0478 |
| 38.6092 | 0.7384 |
| -38.6092 | -0.7384 |
| 4.2697 | 0.303 |
| -4.2697 | -0.303 |
| 4.0741 | 0.2015 |
| -4.0741 | -0.2015 |
| 4.9008 | 0.1434 |
| -4.9008 | -0.1434 |
| 7.0731 | 0.1951 |
| -7.0731 | -0.1951 |
| 3.8002 | 0.0718 |
| -3.8002 | -0.0718 |
| 0.8007 | 0.0813 |
| -0.8007 | -0.0813 |
| 0.7072 | 0.0068 |
| -0.7072 | -0.0068 |
| 8.007 | 0.0813 |
| -8.007 | -0.0813 |
| 0.2641 | 0.0267 |
| -0.2641 | -0.0267 |
| 0.0899 | 0.0847 |
| -0.0899 | -0.0847 |
| 0.0899 | 0.0847 |
| -0.0899 | -0.0847 |
| 22.9298 | 0.1225 |
| -22.9298 | -0.1225 |
| 3.883 | 0.1884 |
| -3.883 | -0.1884 |
| 26.4345 | 0.147 |
| -26.4345 | -0.147 |
| 3.8724 | 0.0712 |

Table S5+ Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|----------|---------|
| KNm | KNm |
| 0.009 | 0.0172 |
| -0.009 | -0.0172 |
| 2.8331 | 0.1438 |
| -2.8331 | -0.1438 |
| -0.0011 | -0.0029 |
| 2.97141 | 0.6971 |
| -2.97141 | -0.6971 |
| 2.868 | 0.177 |
| -2.868 | -0.177 |
| 23.0188 | 0.6121 |
| -23.0188 | -0.6121 |
| 2.864 | 0.139 |
| -2.864 | -0.139 |
| 4.1097 | 0.1191 |
| -4.1097 | -0.1191 |
| 0.5107 | 0.0116 |
| -0.5107 | -0.0116 |
| 4.2173 | 0.081 |
| -4.2173 | -0.081 |
| 1.748 | 0.0278 |
| -1.748 | -0.0278 |
| 0.0627 | -0.008 |
| -0.0627 | 0.008 |
| -0.0102 | -0.0062 |
| 0.0102 | 0.0062 |
| -0.0108 | -0.0062 |
| 0.0108 | 0.0062 |
| -7.1422 | 0.0083 |
| 7.1422 | -0.0083 |
| 1.7108 | 0.112 |
| -1.7108 | -0.112 |
| 2.1782 | 0.1275 |
| -2.1782 | -0.1275 |
| 2.10191 | 0.1344 |
| -2.10191 | -0.1344 |
| 2.1832 | -0.1484 |
| -2.1832 | 0.1484 |
| 20.3868 | 0.0621 |
| -20.3868 | -0.0621 |
| 2.17107 | -0.1797 |
| -2.17107 | 0.1797 |
| 2.8464 | 0.112 |
| -2.8464 | -0.112 |
| -2.7148 | -0.1656 |
| 2.7148 | 0.1656 |
| -1.7634 | -0.1054 |
| 1.7634 | 0.1054 |
| -0.0071 | -0.0075 |
| 0.0071 | 0.0075 |
| -3.9794 | -0.0173 |
| 3.9794 | 0.0173 |
| 1.899 | -0.0188 |

Table S5+ Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|----------|---------|
| KNm | KNm |
| -3.8724 | -0.1712 |
| 3.8724 | 0.1712 |
| -38.064 | -1.113 |
| 38.064 | 1.113 |
| -4.343 | 0.163 |
| 4.343 | -0.163 |
| -3.8019 | -0.0894 |
| 3.8019 | 0.0894 |
| -4.2264 | -0.083 |
| 4.2264 | 0.083 |
| -4.2264 | -0.083 |
| 4.2264 | 0.083 |
| -0.7095 | -0.0264 |
| 0.7095 | 0.0264 |
| -5.3618 | -0.0795 |
| 5.3618 | 0.0795 |
| -2.8541 | 0.0868 |
| 2.8541 | -0.0868 |
| -1.0971 | 0.0699 |
| 1.0971 | -0.0699 |
| 0.146 | 0.0295 |
| -0.146 | -0.0295 |
| 0.0003 | 0.0067 |
| -0.0003 | -0.0067 |
| 0.0644 | 0.006 |
| -0.0644 | -0.006 |
| -8.0098 | 0.0195 |
| 8.0098 | -0.0195 |
| -0.8698 | -0.0188 |
| 0.8698 | 0.0188 |
| 3.8724 | 0.1725 |
| -3.8724 | -0.1725 |
| 24.8688 | 0.0532 |
| -24.8688 | -0.0532 |
| 3.8414 | 0.2099 |
| -3.8414 | -0.2099 |
| 24.8655 | 0.056 |
| -24.8655 | -0.056 |
| -26.4416 | 0.09 |
| 26.4416 | -0.09 |
| 4.2111 | 0.2322 |
| -4.2111 | -0.2322 |
| -3.8718 | -0.1877 |
| 3.8718 | 0.1877 |
| 4.802 | 0.0699 |
| -4.802 | -0.0699 |
| 0.708 | 0.0795 |
| -0.708 | -0.0795 |
| -4.939 | 0.0677 |
| 4.939 | -0.0677 |
| 0.3987 | 0.022 |
| -0.3987 | -0.022 |
| 0.086 | -0.0061 |
| -0.086 | 0.0061 |
| -11.5269 | 0.0723 |
| 11.5269 | -0.0723 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|---------|
| KNm | KNm |
| -0.013 | -0.002 |
| -0.659 | -0.073 |
| 0.184 | 0.026 |
| -0.133 | -0.002 |
| -0.007 | -0.002 |
| -0.029 | -0.001 |
| -0.001 | -0.002 |
| -0.041 | 0.05 |
| -0.078 | -0.003 |
| 2.113 | 0.364 |
| 0.007 | 0.023 |
| 0.007 | 0.023 |
| 2.331 | 0.415 |
| -2.306 | -0.4815 |
| 0.037 | 0.032 |
| -0.037 | -0.032 |
| 2.333 | 0.482 |
| 0.044 | 0.022 |
| 0.044 | 0.022 |
| -0.042 | -0.024 |
| 0.096 | 0.05 |
| -0.042 | -0.024 |
| 0.133 | 0.032 |
| 0.416 | 0.034 |
| -0.448 | -0.035 |
| -0.007 | -0.003 |
| 0.008 | -0.004 |
| 0.001 | -0.0047 |
| -17.612 | -0.022 |
| -0.028 | 0.041 |
| 63.838 | 0.233 |
| 0.008 | 0.008 |
| -0.114 | -0.023 |
| 78.026 | 0.148 |
| 5.7715 | 0.034 |
| -5.7715 | -0.034 |
| 75.928 | 0.133 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|----------|---------|
| KNm | KNm |
| 0.194 | 0.047 |
| -0.007 | -0.007 |
| -12.007 | -0.007 |
| -0.014 | -0.03 |
| 38.228 | 0.0714 |
| 0.481 | 0.1558 |
| 0.979 | 0.272 |
| 45.871 | -0.088 |
| 0.809 | -0.1643 |
| 46.724 | 0.179 |
| -0.009 | -0.053 |
| 8.1627 | 0.015 |
| -8.1627 | -0.015 |
| 0.1037 | 0.033 |
| -0.007 | -0.003 |
| -2.2177 | 0.012 |
| 3.5877 | 0.0718 |
| -1.954 | 0.003 |
| 0.2704 | 0.023 |
| -1.954 | 0.003 |
| 0.2704 | 0.023 |
| 35.4398 | 0.012 |
| 3.0103 | 0.1277 |
| 42.9278 | 0.075 |
| -42.9278 | -0.075 |
| 4.8213 | 0.1627 |
| -4.8213 | -0.1627 |
| 43.112 | 0.082 |
| 4.8213 | 0.1627 |
| 5.7107 | 0.1854 |
| 7.2943 | 0.007 |
| -7.2943 | -0.007 |
| 0.024 | 0.028 |
| -0.024 | -0.028 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|----------|---------|
| KNm | KNm |
| -26.104 | -0.1798 |
| -5.854 | -0.1401 |
| -13.5779 | 0.0584 |
| 1.0308 | 0.0194 |
| -1.0308 | -0.0194 |
| -14.024 | -0.0884 |
| -4.8473 | -0.069 |
| -5.241 | -0.0614 |
| -0.1139 | -0.0147 |
| 0.072 | -0.0133 |
| 0.1791 | -0.0208 |
| -18.7979 | -0.077 |
| 1.534 | -0.028 |
| 72.8748 | 0.025 |
| 11.1068 | 0.039 |
| 88.2278 | 0.028 |
| -13.5048 | 0.225 |
| -13.5048 | -0.225 |
| 67.2084 | -0.1111 |
| 87.2084 | 0.1111 |
| 11.1068 | 0.039 |
| 88.2278 | 0.028 |
| 13.5048 | 0.225 |
| 14.525 | 0.243 |
| -12.4681 | -0.2408 |
| 15.8714 | 0.0188 |
| -15.8714 | -0.0188 |
| 2.2119 | 0.0297 |
| 17.4889 | 0.0133 |
| -15.1074 | -0.032 |
| 8.2731 | 0.0243 |
| -5.8948 | -0.0871 |
| 13.9184 | -0.0182 |
| -0.0019 | -0.0068 |
| -0.0019 | -0.0068 |
| -0.7297 | 0.0497 |
| 0.072 | 0.0074 |
| 4.8622 | 0.002 |
| 0.839 | 0.0233 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|----------|---------|
| KNm | KNm |
| 0.066 | 0.012 |
| 4.388 | 0.054 |
| -1.8487 | 0.0018 |
| 1.9884 | 0.0287 |
| -0.0635 | 0.0035 |
| -0.066 | 0.008 |
| 0.0001 | 0.0001 |
| -0.2271 | -0.0871 |
| 4.8389 | 0.339 |
| 0.224 | 0.036 |
| -0.1374 | 0.004 |
| 0.0001 | 0.0001 |
| -5.007 | -0.468 |
| 0.6297 | 0.0046 |
| -0.6297 | -0.0046 |
| 5.3127 | 0.412 |
| -0.8897 | -0.4916 |
| -0.8897 | -0.4916 |
| 0.03177 | -0.0006 |
| -0.03177 | -0.0006 |
| 0.8633 | 0.0726 |
| -0.8633 | -0.0726 |
| 0.1128 | 0.001 |
| -0.1128 | -0.001 |
| -1.2315 | -0.0089 |
| 0.1817 | 0.0289 |
| -0.1817 | -0.0289 |
| -0.0773 | 0.0058 |
| -0.0773 | 0.0058 |
| -0.1852 | 0.0012 |
| -0.1852 | 0.0012 |
| -0.0214 | 0.0255 |
| 0.081 | 0.0057 |
| 0.081 | 0.0057 |
| -4.3884 | -0.3786 |
| 0.888 | 0.002 |
| -0.888 | -0.002 |
| 4.2171 | 0.4225 |
| -4.2171 | -0.4225 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|---------|
| KNm | KNm |
| -0.027 | -0.029 |
| -5.0186 | -0.463 |
| 1.311 | 0.0282 |
| -1.011 | -0.0282 |
| 5.8141 | 0.4528 |
| -5.8141 | -0.4528 |
| -1.0105 | -0.027 |
| -1.0105 | -0.027 |
| -0.1908 | -0.005 |
| 0.2706 | 0.0284 |
| -1.0025 | -0.0281 |
| -0.0468 | -0.0038 |
| -0.0468 | -0.0038 |
| 0.028 | 0.0087 |
| 0.028 | 0.0087 |
| -0.028 | -0.0087 |
| -0.028 | -0.0087 |
| 0.0457 | 0.0088 |
| 3.6443 | 0.2653 |
| 0.3288 | 0.0058 |
| 4.3716 | 0.4384 |
| -4.3716 | -0.4384 |
| 0.6411 | 0.007 |
| -0.6411 | -0.007 |
| 4.3732 | 0.382 |
| 0.6446 | 0.0078 |
| -0.6446 | -0.0078 |
| -0.7897 | 0.0078 |
| 0.1148 | 0.0013 |
| 0.1148 | 0.0013 |
| 0.1832 | 0.0098 |
| -0.1819 | -0.0077 |
| 0.3288 | 0.027 |
| -0.3288 | -0.027 |
| 0.0052 | 0.0008 |
| 0.0052 | 0.0008 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|---------|
| KNm | KNm |
| 0.697 | 0.0281 |
| 0.7351 | 0.103 |
| -0.7351 | -0.103 |
| 0.105 | 0.0036 |
| -0.105 | -0.0036 |
| 0.9113 | 0.1199 |
| 0.9113 | 0.1199 |
| 0.1352 | 0.014 |
| -0.1352 | -0.014 |
| -0.1738 | 0.0099 |
| 0.4448 | 0.002 |
| -0.4448 | -0.002 |
| -1.5424 | -0.0818 |
| 0.6487 | -0.012 |
| 7.1181 | 0.3393 |
| 0.0389 | 0.0026 |
| 0.0483 | 0.0031 |
| -0.0483 | -0.0031 |
| 8.6241 | 0.4073 |
| -8.6241 | -0.4073 |
| 0.0461 | -0.0029 |
| -1.5232 | -0.0727 |
| 1.5232 | 0.0727 |
| -0.008 | -0.0004 |
| -0.008 | -0.0004 |
| -1.1413 | -0.0728 |
| 0.374 | 0.0226 |
| -0.374 | -0.0221 |
| 0.0448 | -0.0008 |
| 0.0448 | -0.0008 |
| -1.8588 | -0.0884 |
| 0.008 | -0.002 |
| 9.8441 | 0.597 |
| 0.002 | 0.002 |
| 0.002 | 0.002 |

Table S5+ Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|---------|
| KNm | KNm |
| 11.620 | 0.0716 |
| 0.033 | 0.0024 |
| -0.033 | -0.0024 |
| 12.928 | 0.0696 |
| -11.842 | -0.0726 |
| 0.192 | 0.004 |
| -2.300 | -0.1169 |
| 0.003 | 0.0004 |
| -0.003 | -0.0004 |
| 2.873 | 0.1719 |
| 0.261 | 0.0141 |
| -0.641 | -0.0387 |
| 0.090 | -0.002 |
| -0.070 | -0.0408 |
| -11.995 | -0.0827 |
| 0.048 | 0.0039 |
| 33.318 | 0.2699 |
| 3.702 | 0.1637 |
| -0.899 | -0.0484 |
| -30.981 | -0.7023 |
| 4.472 | 0.1981 |
| -4.472 | -0.1981 |
| 30.402 | 0.6897 |
| -0.034 | -0.0079 |
| -1.074 | -0.2937 |
| 7.142 | 0.1343 |
| -0.798 | -0.0254 |
| -4.705 | -0.2702 |
| -0.609 | -0.141 |
| -0.092 | -0.0056 |
| -0.071 | -0.0226 |
| -0.034 | 0.0044 |

Table S5+ Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|---------|
| KNm | KNm |
| -0.099 | -0.006 |
| -1.344 | -0.1 |
| 0.043 | 0.001 |
| -0.003 | -0.001 |
| 1.328 | 0.0595 |
| -1.364 | -0.1012 |
| -0.002 | -0.0013 |
| -0.027 | -0.0048 |
| -0.097 | -0.0151 |
| -0.014 | -0.014 |
| 0.076 | -0.0008 |
| 12.943 | 0.069 |
| 2.201 | 0.043 |
| -0.03 | -0.0787 |
| 14.943 | 0.0443 |
| 2.862 | 0.048 |
| -2.862 | -0.048 |
| 14.068 | -0.0478 |
| -14.063 | -0.1361 |
| 2.813 | -0.0451 |
| 2.811 | 0.0709 |
| -2.811 | -0.0709 |
| 0.275 | 0.0037 |
| -0.475 | -0.0097 |
| 2.862 | -0.0971 |
| -1.304 | -0.1187 |
| -0.048 | -0.0018 |
| 0.047 | -0.0057 |
| -0.047 | -0.0057 |
| 10.346 | 0.013 |
| 1.978 | 0.2094 |
| 0.099 | -0.0022 |
| 12.299 | 0.0702 |

Table S5+ Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|---------|
| KNm | KNm |
| 0.001 | 0.0047 |
| -0.002 | -0.0055 |
| 22.771 | 0.1346 |
| 3.014 | 0.1641 |
| -0.394 | 0.0272 |
| 27.23 | 0.1616 |
| -2.862 | -0.1361 |
| 5.603 | 0.259 |
| -3.607 | -0.1569 |
| 26.944 | 0.1932 |
| -27.081 | -0.13 |
| 3.901 | 0.1975 |
| 4.076 | 0.208 |
| -4.076 | -0.208 |
| 0.651 | 0.0225 |
| -0.651 | -0.0225 |
| 4.833 | 0.0726 |
| -4.833 | -0.0726 |
| 0.051 | 0.0056 |
| -0.051 | -0.0056 |
| 4.705 | -0.119 |
| -4.705 | -0.119 |
| -0.032 | 0.016 |
| 3.016 | 0.1702 |
| -0.118 | 0.0082 |
| 3.016 | 0.1702 |
| 3.046 | 0.269 |
| -2.391 | -0.1361 |
| -2.322 | -0.131 |
| 1.311 | -0.164 |
| -4.868 | 0.0042 |
| -4.868 | -0.0042 |
| 0.618 | 0.0086 |
| -0.618 | -0.0086 |
| 4.931 | 0.0943 |

Table S5+ Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|---------|
| KNm | KNm |
| -12.298 | -0.0702 |
| -2.272 | -0.2534 |
| 12.946 | -0.0448 |
| -12.251 | -0.0771 |
| 2.708 | 0.1925 |
| -2.729 | -0.1143 |
| -2.197 | -0.0023 |
| -0.008 | 0.0443 |
| -2.701 | -0.0540 |
| -2.864 | -0.0979 |
| -1.019 | -0.1174 |
| 0.048 | -0.0069 |
| -0.259 | -0.0031 |
| -0.131 | -0.0004 |
| -0.146 | -0.0004 |
| -0.010 | -0.0022 |
| 2.868 | 0.3897 |
| 2.868 | 0.0688 |
| 0.184 | 0.0142 |
| -0.184 | -0.0142 |
| 0.007 | 0.0016 |
| -0.007 | -0.0016 |
| 0.039 | 0.0031 |
| -0.039 | -0.0031 |
| -0.068 | 0.0078 |
| -0.068 | -0.0078 |
| -0.142 | 0.0229 |
| -0.142 | -0.0229 |
| -0.004 | -0.0003 |
| -0.186 | -0.0022 |
| -0.004 | 0.0015 |
| -0.099 | 0.0016 |

Table S5+ Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|--------|---------|
| KNm | KNm |
| -0.001 | 0.0038 |
| -2.843 | 0.011 |
| -0.019 | -0.003 |
| -0.005 | -0.0008 |
| -0.003 | -0.0004 |
| -0.003 | -0.0002 |
| 6.846 | 0.3792 |
| -0.017 | -0.0039 |
| 7.808 | 0.4051 |
| -0.079 | -0.0166 |
| 0.079 | 0.0166 |
| 7.803 | 0.4044 |
| -7.808 | -0.4058 |
| 0.046 | 0.012 |
| -0.046 | -0.012 |
| 1.412 | 0.0813 |
| -1.412 | -0.0813 |
| 0.071 | 0.003 |
| -0.071 | -0.003 |
| 1.981 | 0.0977 |
| -1.981 | -0.0977 |
| -0.022 | -0.0047 |
| -0.041 | -0.0028 |
| -0.009 | -0.0006 |
| -0.009 | -0.0001 |
| 0.006 | 0.0019 |
| -1.097 | 0.0796 |
| 0.042 | -0.0031 |
| 6.259 | 0.4489 |
| 0.042 | 0.0042 |
| -0.017 | -0.0007 |
| -7.319 | -0.4603 |
| 0.023 | 0.0056 |
| -0.023 | -0.0056 |
| 7.484 | 0.5595 |
| -7.528 | -0.561 |
| 0.046 | 0.0031 |

Table S5+ Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|--------|---------|
| KNm | KNm |
| -0.001 | 0.004 |
| 3.351 | 0.2113 |
| 0.747 | 0.0444 |
| -0.282 | -0.0006 |
| 3.782 | 0.4096 |
| -3.992 | -0.4096 |
| -0.007 | -0.0002 |
| 4.178 | 0.4105 |
| 0.679 | 0.0571 |
| -1.917 | -0.0031 |
| 0.077 | -0.0031 |
| -0.074 | -0.01 |
| 0.297 | 0.077 |
| -1.044 | -0.0783 |
| -0.005 | -0.0012 |
| -0.005 | -0.0012 |
| -0.005 | -0.0009 |
| -0.005 | -0.0001 |
| -0.005 | -0.0001 |
| 2.842 | 0.261 |
| 0.003 | 0.0006 |
| -0.003 | -0.0006 |
| 0.041 | 0.0037 |
| -0.029 | -0.0001 |
| 3.699 | 0.033 |
| 0.041 | 0.0037 |
| -0.041 | -0.0037 |
| 0.003 | 0.0006 |
| -0.003 | -0.0006 |
| 3.525 | 0.4033 |
| -3.589 | -0.4034 |
| 0.041 | 0.0037 |
| 0.041 | 0.0037 |
| -0.041 | -0.0037 |
| -0.041 | -0.0037 |
| 0.003 | 0.0006 |
| -0.003 | -0.0006 |
| 0.003 | 0.0006 |
| -0.003 | -0.0006 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|--------|
| KNm | KNm |
| 0.042 | -0.028 |
| 0.028 | -0.007 |
| -7.248 | -0.003 |
| 0.828 | -0.009 |
| 17.218 | 0.144 |
| 2.197 | 0.066 |
| 20.859 | 0.172 |
| -20.659 | -0.172 |
| -2.545 | -0.155 |
| 20.962 | 0.192 |
| -2.048 | -0.202 |
| 3.882 | 0.096 |
| -3.882 | -0.096 |
| 0.648 | 0.078 |
| 3.888 | -0.028 |
| -3.764 | -0.083 |
| 1.821 | -0.020 |
| -1.508 | -0.086 |
| 0.697 | -0.047 |
| -0.107 | -0.009 |
| -7.434 | -0.059 |
| 0.879 | -0.044 |
| 18.428 | 0.023 |
| -4.101 | -0.072 |
| 22.818 | 0.056 |
| -20.178 | -0.056 |
| -2.000 | -0.108 |
| 4.938 | 0.117 |
| -4.938 | -0.117 |
| 0.883 | 0.079 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|--------|
| KNm | KNm |
| -0.032 | -0.027 |
| 0.027 | 0.007 |
| -61.853 | -1.158 |
| 10.768 | 0.289 |
| -10.778 | -0.289 |
| 61.289 | 0.196 |
| -62.949 | -0.187 |
| 11.428 | 0.082 |
| -11.428 | -0.082 |
| -11.048 | -0.078 |
| 1.928 | 0.044 |
| -1.928 | -0.044 |
| 3.481 | 0.089 |
| -4.487 | 0.018 |
| -10.373 | -0.078 |
| -5.888 | -0.091 |
| 0.648 | -0.034 |
| 0.624 | -0.024 |
| 0.838 | -0.062 |
| 0.028 | -0.006 |
| -14.674 | 0.086 |
| 0.838 | -0.062 |
| 46.443 | 0.187 |
| 3.481 | 0.089 |
| 56.748 | 1.122 |
| -56.748 | -1.122 |
| 4.238 | 0.083 |
| -4.238 | -0.083 |
| 4.302 | 0.084 |
| -4.363 | -0.103 |
| 9.842 | 0.022 |
| -9.894 | -0.022 |
| 0.782 | 0.019 |
| -0.782 | -0.019 |
| 3.823 | -0.081 |
| -3.861 | -0.081 |
| 0.888 | -0.033 |
| 0.929 | 0.046 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|--------|
| KNm | KNm |
| -0.433 | -0.029 |
| -4.288 | -0.176 |
| -1.818 | 0.016 |
| -1.778 | -0.115 |
| -0.046 | -0.043 |
| -0.037 | 0.047 |
| -0.014 | 0.038 |
| -0.043 | 0.038 |
| -0.887 | -0.044 |
| 11.886 | 0.281 |
| 2.296 | 0.037 |
| 14.476 | 0.013 |
| -14.576 | -0.013 |
| 2.892 | 0.049 |
| -2.892 | -0.049 |
| 14.987 | 0.027 |
| 2.892 | 0.049 |
| -2.892 | -0.049 |
| 2.821 | 0.056 |
| -2.821 | -0.056 |
| 0.648 | 0.016 |
| 2.892 | 0.049 |
| -2.772 | 0.081 |
| 1.178 | 0.134 |
| -1.537 | 0.089 |
| -0.613 | 0.091 |
| 0.016 | 0.088 |
| 0.016 | 0.086 |
| -5.674 | 0.421 |
| -0.892 | -0.083 |
| 10.153 | 0.074 |
| 0.192 | 0.033 |
| 12.224 | 0.057 |
| -12.224 | -0.057 |
| 2.303 | 0.293 |
| -2.303 | -0.293 |
| 12.297 | 0.078 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|--------|--------|
| KNm | KNm |
| 0.024 | 0.017 |
| -0.083 | -0.054 |
| 0.024 | -0.012 |
| 2.118 | 0.36 |
| 0.071 | 0.077 |
| 0.03 | 0.036 |
| -2.248 | -0.38 |
| -0.008 | 0.003 |
| 2.647 | 0.446 |
| -2.644 | -0.444 |
| -0.001 | -0.002 |
| 0.643 | 0.072 |
| -0.643 | -0.072 |
| 0.015 | 0.017 |
| -0.019 | -0.017 |
| -0.007 | -0.011 |
| 0.148 | 0.029 |
| 0.024 | 0.006 |
| 0.034 | 0.005 |
| 0.034 | 0.005 |
| 0.007 | 0.008 |
| -0.073 | 0.06 |
| 0.006 | -0.003 |
| 2.199 | 0.394 |
| 0.047 | 0.075 |
| 0.047 | 0.075 |
| 2.318 | 0.413 |
| -2.318 | -0.413 |
| 0.192 | 0.091 |
| 2.388 | 0.483 |
| 0.087 | 0.142 |
| -0.072 | -0.04 |
| 0.421 | 0.77 |
| -0.421 | -0.77 |
| 0.075 | 0.076 |
| -0.075 | -0.076 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|--------|
| KNm | KNm |
| -12.191 | 0.056 |
| -2.277 | -0.132 |
| 2.168 | 0.046 |
| -2.168 | -0.046 |
| 0.419 | 0.043 |
| -0.419 | -0.043 |
| 2.295 | 0.043 |
| -2.295 | -0.043 |
| 1.108 | 0.136 |
| -1.028 | 0.051 |
| 0.046 | 0.021 |
| -0.046 | -0.021 |
| -0.944 | -0.066 |
| -11.486 | -0.112 |
| 0.884 | 0.012 |
| 32.187 | 0.14 |
| 4.152 | 0.119 |
| 14.987 | 0.074 |
| 38.152 | 0.122 |
| -5.024 | -0.154 |
| 5.024 | -0.154 |
| 4.088 | 0.084 |
| -4.088 | -0.084 |
| 6.887 | 0.032 |
| -6.887 | -0.032 |
| 0.892 | 0.042 |
| 6.843 | -0.077 |
| -7.079 | -0.068 |
| 2.428 | -0.019 |
| -3.598 | -0.084 |
| -0.688 | -0.047 |
| -0.107 | -0.043 |
| -0.117 | -0.046 |
| -18.287 | 0.019 |
| 1.94 | -0.064 |
| 51.543 | 0.299 |
| 6.919 | 0.248 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

| MY | MZ |
|---------|--------|
| KNm | KNm |
| 0.698 | 0.034 |
| 0.142 | 0.027 |
| -0.193 | -0.018 |
| 0.047 | 0.061 |
| 0.265 | 0.022 |
| 0.048 | 0.04 |
| -0.048 | -0.04 |
| -17.767 | -0.164 |
| 0.702 | -0.022 |
| 63.194 | 0.112 |
| 4.881 | 0.063 |
| 0.341 | 0.028 |
| -2.633 | -0.138 |
| 5.644 | 0.119 |
| -5.644 | -0.119 |
| 76.222 | 0.165 |
| -76.222 | -0.165 |
| 4.25 | -0.088 |
| -13.549 | -0.043 |
| 1.098 | 0.021 |
| -1.098 | -0.021 |
| -11.376 | 0.035 |
| 5.586 | 0.027 |
| -4.601 | 0.006 |
| 0.384 | 0.029 |
| -0.384 | -0.029 |
| 0.718 | 0.034 |
| -0.718 | -0.034 |
| 1.341 | 0.083 |
| -1.341 | -0.083 |
| 1.098 | 0.021 |
| -1.098 | -0.021 |
| 1.341 | 0.083 |
| -1.341 | -0.083 |
| 1.341 | 0.083 |
| -1.341 | -0.083 |
| 1.341 | 0.083 |
| -1.341 | -0.083 |
| 1.341 | 0.083 |
| -1.341 | -0.083 |
| 1.341 | 0.083 |
| -1.341 | -0.083 |

Table S5 - Joint Reactions (Part 2 of 2 continued)

Table with 4 columns: MY (kNm), MZ (kNm), kNm, kNm. Rows include reaction values for various models.

Table S5 - Joint Reactions (Part 2 of 2 continued)

Table with 4 columns: MY (kNm), MZ (kNm), kNm, kNm. Rows include reaction values for various models.

Table S5 - Joint Reactions (Part 2 of 2 continued)

Table with 4 columns: MY (kNm), MZ (kNm), kNm, kNm. Rows include reaction values for various models.

Table S5 - Joint Reactions (Part 2 of 2 continued)

Table with 4 columns: MY (kNm), MZ (kNm), kNm, kNm. Rows include reaction values for various models.

Table S5 - Joint Reactions (Part 2 of 2 continued)

Table with 4 columns: MY (kNm), MZ (kNm), kNm, kNm. Rows include reaction values for various models.

Table S5 - Modal Periods And Frequencies (continued)

Table with 6 columns: Case, Mode, sec, Cyclics, rads/sec, Eigenmode. Rows include modal data for cases 0-12.

Table S7 - Modal Participating Mass Ratios (Part 1 of 2)

Table with 12 columns: Case, Mode, Period, UX, UV, UZ, SumUX, SumUV, SumUZ, RX, RY, RZ. Rows include mass ratio data for cases 0-12.

Table S8 - Modal Participating Mass Ratios (Part 2 of 2)

Table with 4 columns: Case, Mode, Period, SumUX, SumUV, SumUZ. Rows include mass ratio data for cases 0-12.

S4 Modal Results

Table S3 - Modal Periods And Frequencies

Table with 6 columns: Case, Mode, Period, Cyclics, rads/sec, Eigenmode. Rows include modal data for cases 0-5.

Table S3 - Modal Load Participation Ratios

Table with 4 columns: Case, IdentType, Ratio, Static Dynamic. Rows include load participation data for cases 0-5.

Table S.9 - Model Direction Factors

| Case | Model | Period sec | IX | UY | UZ | RZ |
|-------|-------|---------------|-------|-------|----|-------|
| Model | 1 | 0.248 | 1 | 0 | 0 | 0 |
| Model | 2 | 0.15 | 0 | 1 | 0 | 0 |
| Model | 3 | 0.15 | 0 | 1 | 0 | 0 |
| Model | 4 | 0.046 | 1 | 0 | 0 | 0 |
| Model | 5 | 0.046 | 0 | 0 | 0 | 1 |
| Model | 6 | 0.036 | 0 | 1 | 0 | 0 |
| Model | 7 | 0.029 | 0.989 | 0 | 0 | 0.001 |
| Model | 8 | 0.029 | 0.989 | 0 | 0 | 0.001 |
| Model | 9 | 0.025 | 0.002 | 0.001 | 0 | 0.997 |
| Model | 10 | 0.024 | 0.002 | 0 | 0 | 0.998 |
| Model | 11 | 0.023 | 0.001 | 0.002 | 0 | 0.997 |
| Model | 12 | 0.022 | 0 | 0.046 | 0 | 0.964 |