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ING. JULIO PATERNINA

PROYECTO:

ESTACIÓN DE BOMBEROS BOCAGRANDE

MEMORIA JUSTIFICATIVA DEL CÁLCULO Y DISEÑO ESTRUCTURAL

WALBERTO RIVERA MARTÍNEZ
INGENIERO ESTRUCTURAL

Cartagena de Indias, D.T. y C., noviembre de 2023

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Cartagena, Colombia.

Código: F05-7	Versión: 1	Fecha: 30-07-2012	Proceso Ref: Calculo y Diseño	VoBo.
Proyecto:	**ESTACIÓN DE BOMBEROS BOCAGRANDE**			
Código:	**23-PAYE-014**			
Elaborado: **Sainer M. Beltrán Pinto** Asistente de proyectos			Aprobado: **Walberto Rivera Martínez** Jefe de proyectos	

Controlador de cambios:					
Versión	Fecha	Motivo del cambio	Generador del cambio	Revisado por:	Aprobado por:
0	**17-11-2023**	**Entrega inicial**			**WRM**
1	**3-07-2024**	**Rev. Curaduria**			**WRM**

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1. INTRODUCCIÓN

La presente memoria corresponde al **ANALISIS, CALCULO Y DISEÑO ESTRUCTURAL** para la construcción de la **ESTACIÓN DE BOMBEROS DE BOCAGRANDE**, localizada en la ciudad de **CARTAGENA DE INDIAS –** Capital del Departamento de **BOLÍVAR.**

La edificación esta conformada por cinco niveles o pisos, distribuidos de la siguiente manera:

- **Primer Piso:** Contiene el espacio para carros bomberos, áreas para la parte operativa de la estación.
- **Mezanine:** Contiene un salón de capacitaciones
- **Segundo Piso:** Contiene el área para hospedar a los brigadistas.
- **Tercero Piso:** Contiene un área para comedor y el área para la operación de la parte administrativa de la estación.
- **Cuarto Piso:** Contiene un área denominada sala de crisis.

2. DESCRIPCIÓN DE LAS ESTRUCTURAS

2.1. INFRAESTRUCTURAS

La cimentación se calcula de acuerdo a las recomendaciones geotecnicas presentadas por el ingeniero **MODESTO BARRIOS FONTALVO**, en su informe de julio de 2023, y consiste en dados apoyados sobre pilotes de 0.40 mts de diámetro y 12 mts de longitud, con capacidad de carga de **39.68 Ton/Pilote**. A nivel de dados una retícula de vigas ortogonales brindará la integridad ante asentamientos diferenciales o acciones sísmicas.

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2.2 SUPERESTRUCTURAS

La estructura la conforma un pórtico espacial en concreto reforzado, conformado por vigas, columnas, con nudos resistentes a momentos, el pórtico se considera empotrado a nivel de cimentación y será capaz de tomar las cargas gravitacionales, cargas sísmicas y de viento.

El primer piso se construirá sobre el suelo natural, adecuando el sitio como lo especifica el estudio de suelos, todos los pisos serán una placa maciza armada en una dirección de 50 cm de peralte, éstos serán monolíticos, actuando como diafragmas rígidos formando parte integral del pórtico espacial.

3. NORMAS DE CÁLCULO Y DISEÑO

3.1 ESTRUCTURA DE CONCRETO.

Reglamento Colombiano de Construcción Sismo Resistente NSR-10, Titulo C.

3.2 CIMENTACION.

Reglamento Colombiano de Construcción Sismo Resistente **NSR-10, Capitulo C.15**.

3.3 MÉTODOS DE ANÁLISIS

Modelo matemático espacial, analizado mediante el método matricial de los desplazamientos, que nos permite a partir de las hipótesis de cargas y sus combinaciones calcular la envolvente de fuerzas que ocurrirán en la estructura.

Para efectos del análisis sísmico se utiliza el método de análisis dinámico.

La modelación matemática de la geometría de los elementos estructurales para la obtención de la rigidez de la estructura se realizo teneniendo en cuenta las inercias y áreas brutas de los mismos.

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4. MÉTODOS DE DISEÑO

4.1 ESTRUCTURA EN CONCRETO REFORZADO

Método de la Resistencia última, de acuerdo los Titulos A, B y C de la NSR-10.

4.2 ELEMENTOS NO ESTRUCTURALES (muros divisorios y antepechos)

Se diseñan de acuerdo a las recomendaciones de la NSR-10:

Capítulo A.9, muros con grado de desempeño Bueno y

Capítulo D-10 muros en mampostería confinada.

4.3 COMBINACIONES DE CARGA PARA EL DISEÑO

En el anexo 2 de esta memoria se presentan las combinaciones de cargas utilizadas, de acuerdo con el Titulo B de la NSR-10

5. MATERIALES

5.1 CONCRETO REFORZADO

f'_c = 5.000 Psi (350 Kg/Cm^2) a los 28 días de edad para todo el sistema de resistencia estructural.

5.2 ACERO DE REFUERZO:

F_y = 60000 Psi (4200 Kg/Cm^2) para ϕ 3/8” a ϕ 1” PDR-60

6. REQUISITOS DE DURABILIDAD

Agresión del medio ambiente moderada. Concreto requerido por durabilidad Normal

Microclima atmósfera rural. Humedad Relativa del 60 a 98% actuando procesos de humedecimiento y secado.

CO_2 en el ambiente menor o igual al 0.3%

Cloruros en el ambiente menor de 500 mg/l

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Máximo Contenido de Ion Cloruro expresado en % del Peso del Cemento: 0.3.
Ver Tabla C.4-5 NSR-10.
Exposición a Sulfatos despreciable. Ver tabla C.4-4 NSR-10
Relación Agua – Cemento 0.50
Tipo de Cemento Pórtland Tipo I
Vigas de Amarre y de enlace: 5 cm.
Columnas, vigas: 4 cms
Escaleras, viguetas de entrepiso: 3 cms
Peso específico del concreto: $\gamma = 2400\ Kg/m^3$

7. REQUISITOS DE PROTECCION CONTRAINCENDIOS

La **NSR-10** en el **Titulo J** establece que: toda edificación deberá cumplir los requisitos mínimos de protección contra incendios establecidos en ese capitulo, correspondientes al uso de la edificación y su grupo de ocupación, de acuerdo con la clasificación dada en ítem J.1.1.2.
La estructura analizada se clasifica dentro de los grupos y subgrupos como **I-5 (Servicio público)**, según la tabla J.1.1-1 de la NSR-10.

La edificación cumple con los requisitos de Acceso, y constituye una edificación diseñada precisamente como estación de bomberos, con hidrantes con caudales superiores a 63 L/s

Clasificación del material según el índice de propagación de llama.

Tabla J.2.5-2
Clasificación del material según su característica de propagación de la llama [1]

Clase	Índice de propagación de la llama
1	0 a 25
2	26 a 75
3	76 a 225
4	Más de 225

NOTA: 1. Clasificación obtenida de acuerdo con la norma NTC 1691

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Tabla J.2.5-3
Clasificación de algunos materiales utilizados para acabados interiores según índice de propagación de la llama *

Clase	Materiales
1	• Pañetes de cemento • Cartón de Fibro - cemento • Fibro – asfalto • Placas planas de fibrocemento • Placas planas de fibrosilicato • Ladrillo • Baldosas de cerámica • Lana de vidrio sin aglutinantes ni aditivos • Vidrio • Algunos azulejos antiacústicos
2	• Hoja de aluminio sobre respaldo apropiado. • Cartón de fibra o yeso con revestimiento de papel. • Madera tratada mediante impregnación. • Algunos pañetes antisonoros. • Algunos azulejos antiacústicos.
3	• Madera de espesor nominal de 2,5 cm o más. • Planchas de fibra con revestimiento a prueba de fuego. • Azulejo antiacústicos, combustible, con revestimiento a prueba de fuego. • Cartón endurecido. • Algunos plásticos.
4	• Papel asfáltico • Tela • Viruta • Superficies cubiertas con aceite o parafina. • Papel • Plásticos, sin grado que permita asignarlos a otras clases • Algodón

Nota: (*) Clasificación obtenida siguiendo procedimiento de la "Prueba de Túnel" Norma NTC 1691, en su versión más reciente.

Tabla J.3.5-1
Espesor mínimo equivalente, e_E, de muros de mampostería de arcilla, en mm, en función de la resistencia al fuego en horas. Véase la Nota-1

Tipo de unidad	Resistencia al fuego en horas		
	1 Nota-2	2	3
Maciza	60	90	110
De perforación vertical	50	80	100
De perforación horizontal	45	65	90

Nota-1: Las unidades de mampostería de arcilla deben cumplir los requisitos dados en D.3.6 respecto a propiedades y normas técnicas.

Nota-2: La resistencia al fuego de 1 hora se considera que se cumple implícitamente en las siguientes unidades de arcilla:

(a) Para unidades macizas hasta con 25% de vacíos, 1 hora de resistencia al fuego se cumple con unidades de ancho nominal de 100 mm.

(b) Para unidades de perforación vertical hasta con 65% de vacíos (máximo porcentaje de vacíos permitido por D.3.6.4.1) y con sus celdas para alojar refuerzo vertical con o sin mortero de relleno, 1 hora de resistencia al fuego se cumple con unidades con ancho nominal de 120 mm.

(c) Para unidades de perforación horizontal que cumplan con los espesores mínimos de pared establecidos en la norma NTC 4205, 1 hora de resistencia al fuego se cumple con unidades con ancho nominal de 100 mm.

De acuerdo a la clasificación de la estructura el espesor minimo equivalente, e_E, de muros de mampostería de arcilla en mm, en función de la resistencia al fuego

según la tabla J.3.5-1 para 1 hora es 50 mm, para mampostería de perforación vertical.

Tabla J.2.5-4
Clasificación requerida del índice de propagación de llama para acabados interiores de acuerdo con el grupo de ocupación de cada edificación

Grupo de Ocupación		Ubicación del acabado interior			
		Medios de Salida Normales	Corredores	Espacios con áreas < 170 m^2	Espacios con áreas > 170 m^2
ALMACENAMIENTO	(A-1)	1	1	2	3
	(A-2)	1	1	2	3
COMERCIAL	(C-1)	1	1	3	3
	(C-2)	1	1	2	3
ESPECIAL	(E)	1	1	2	2
FABRIL E INDUSTRIAL	(F-1)	1	2	2	2
	(F-2)	1	2	2	3
INSTITUCIONAL	(I-1)	1	1	2	2
	(I-2)	1	1	2	2
	(I-3)	1	1	2	3
	(I-4)	1	2	2	3
	(I-5)	1	2	3	3
LUGARES DE REUNIÓN	(L)	1	2	2	2
MIXTO Y OTROS	(M)	1	1	2	3
ALTA PELIGROSIDAD	(P)	1	1	2	2
RESIDENCIAL	(R-1)	2	2	4	4
	(R-2)	1	1	2	2
	(R-3)	1	1	2	2
TEMPORAL	(T)	1	2	3	3

De acuerdo a la clasificación de la es estructura que es **I-5**, los materiales que se utilicen para acabados interiores deben tener una caracterisca de propagación de llamas para la clase 1: entre 0 a 25 y para la clse 2: 26 a 75, Y para las áreas mayores a 170 m^2 se deben utilizar materiales clase 3: 76 a 225.

En cumplimiento de los requisitos de resistencia contra incendios, la edificación por su naturaleza contará con Proteccion Activa y Pasiva, y la clasificamos en **FUNCIÓN DEL RIESGO DE PÉRDIDAS DE VIDAS HUMANAS O AMENAZA DE COMBUSTION** en **Categoría I, Tabla J.3.3-1, para grupo de uso I5.**

La resistencia requerida al fuergo normalizado NTC 1480 (ISO 834). 2n horas, para los elementos estructurales de los materiales cubiertos porlos títulos C y G de la NSR-10, para categoría I según Tabla J.3.3.1, es de 2 horas, con las provisiones del numeral J.3.5. Los recubrimientos y el tamaño de los miembros y espesores cumplen para la resistencia requerida de 2 horas.

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Para la escalera auxiliar externa, que se contempla en estructuras metálicas, se propone utilizar un recubrimiento intumescente con protección certificada de hasta 3 horas.

8. MODULO DE ELASTICIDAD DEL CONCRETO (C.8.5 – NSR-10).

Concreto de 5000 psi = $4700\sqrt{35} = 27805.575\ MPa$

9. ANALISIS DE CARGAS.

9.1 CARGAS GRAVITACIONALES

9.1.1 Placa entrepiso

Losa de concreto h= 12.5 cm	=	300.00 Kg/m^2
Acabados	=	100.00 Kg/m^2
Posibles muros	=	250.00 Kg/m^2
Cielo raso	=	50.00 Kg/m^2
C. Muerta	=	700.00 Kg/m^2
C. Viva	=	200.00 Kg/m^2

9.1.2 Escaleras

		Peldaños	Descanso
Placa de concreto	=	360.00 Kg/m^2	360.00 Kg/m^2
Acabados S/NSR-10	=	150.00 Kg/m^2	150.00 Kg/m^2
Peso peldaños	=	216.00 Kg/m^2	------
C. Muerta	=	726.00Kg/m^2	510.00Kg/m^2
C. Viva	=	300.00Kg/m^2	300.00Kg/m^2
Q	=	1026.00Kg/m^2	810.00Kg/m^2

9.1.3 Placa Cubierta

Pendientado	=	150.00 Kg/m^2
Losa de concreto h= 12.5 cm	=	300.00 Kg/m^2
Cielo raso	=	50.00 Kg/m^2
C. Muerta	=	500.00 Kg/m^2
C. Viva	=	200.00 Kg/m^2

Cargas vivas minimas uniformemente distribuidas segun **Tabla B.4.2.1-1 – NSR-10**

Los balcones tendran una carga viva para el analisis de **500 Kg/m^2**

9.2 CARGAS SISMICAS

En el Anexo No. 2 se muestran los parámetros sísmicos y las cargas de diseño.

9.3 CARGAS DE VIENTO

En el Anexo No. 2 se muestra el análisis de viento de la estructura.

10. MODELO MATEMÁTICO

Para el análisis y diseño del proyecto utilizamos un modelo discreto consistente en un pórtico espacial con nudos resistentes a momentos, empotrados a nivel de cimentación, capaces de soportar las combinaciones de carga. Los programas utilizados para análisis y diseño de la estructura son Midas Gen y Set Licenciados a Paye Inegenieria S.A.S. (U001-02158 y U001-03044), DCCAD versión 2010, llaves 176 y 287.

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10.1 MODELO MATEMATICO

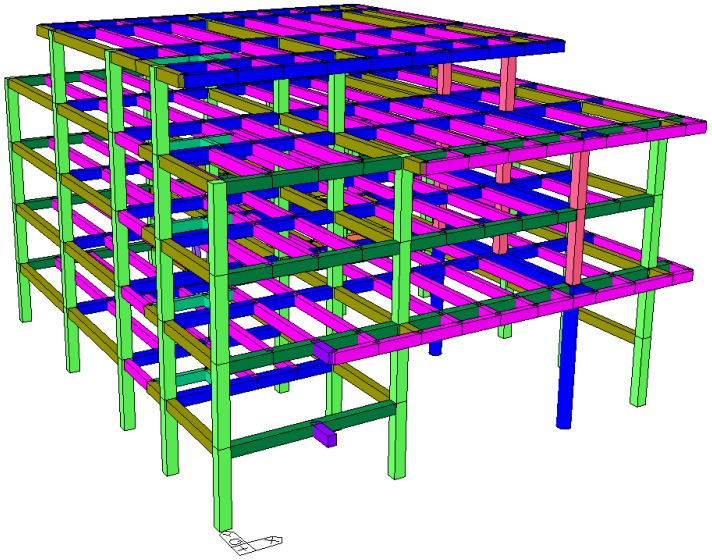


Figura 1: VISTA ISOMETRICA 1

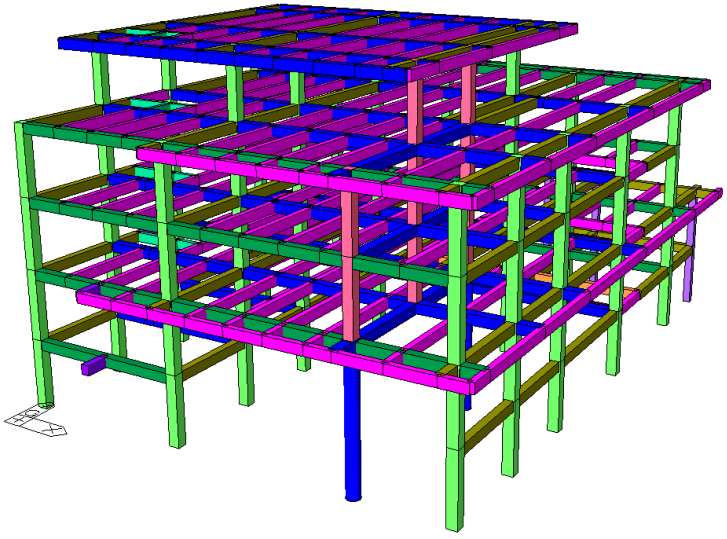


Figura 2: VISTA ISOMETRICA 2

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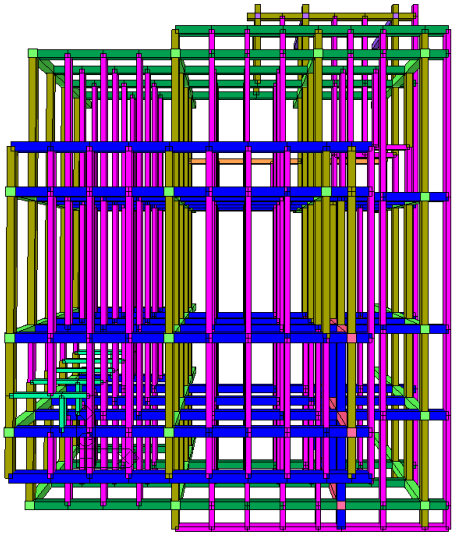


Figura 3: VISTA EN PLANTA

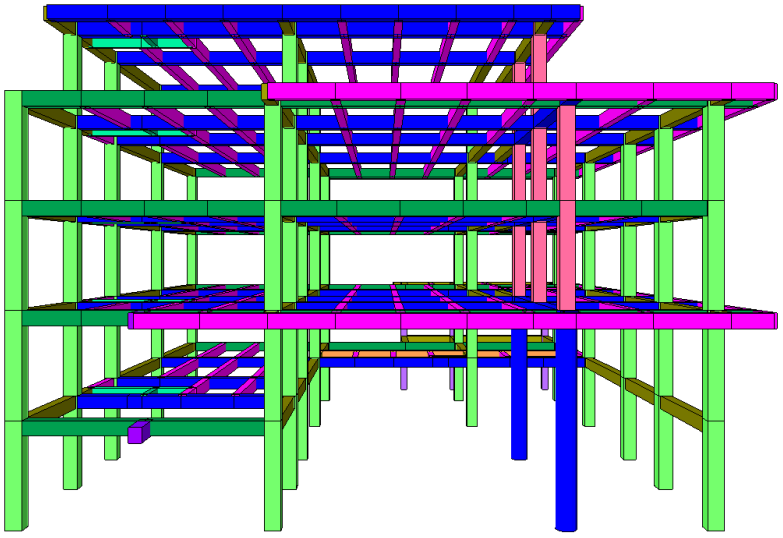


Figura 4: VISTA FRONTAL

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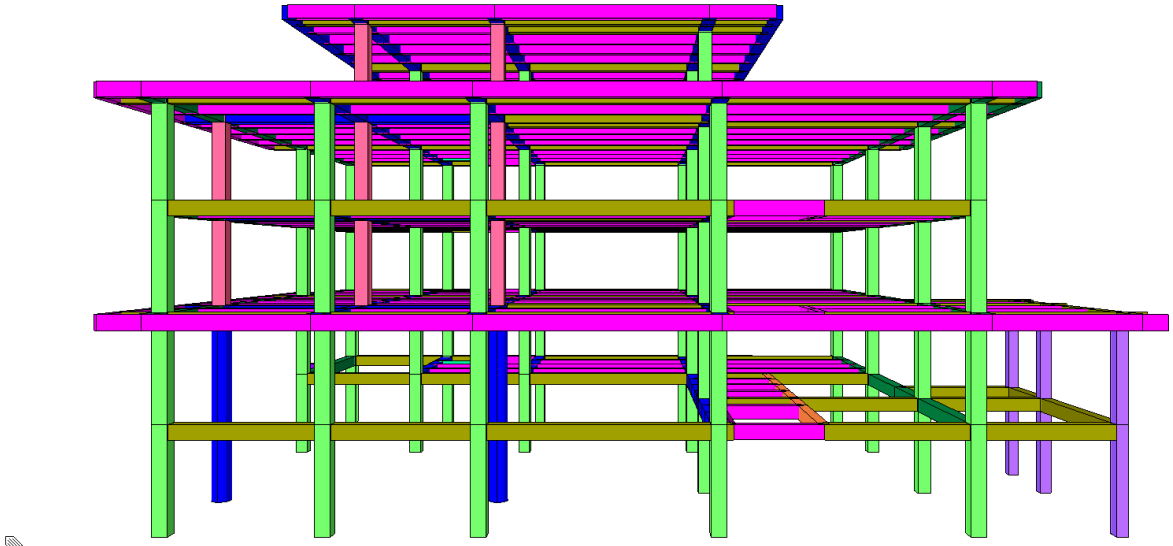


Figura 5: VISTA LATERAL

11. ANALISIS SISMICO

En el Anexo 1 se presentan los resultados del análisis sísmico del modelo matemático, aplicándole las cargas sísmicas halladas por el método de Análisis Dinamico.

12. CÁLCULO DE LA DERIVA.

En el Anexo 1 se presentan los resultados del análisis de la deriva y el índice de estabilidad del modelo matemático, aplicándole las cargas sísmicas halladas por el método de Análisis Dinámico.

13. CIMENTACIÓN

La cimentación se calcula de acuerdo a las recomendaciones geotecnicas presentadas por el ingeniero **MODESTO BARRIOS FONTALVO**, en su informe de julio de 2023, y consiste en dados apoyados sobre pilotes de 0.40 mts de diámetro y 12 mts de longitud, con capacidad de carga de **39.68 Ton/Pilote**.

A nivel de dados una retícula de vigas ortogonales brindará la integridad ante asentamientos diferenciales o acciones sísmicas.

14. ANÁLISIS Y DISEÑO DE LA PROPUESTA DE INTERVENCIÓN

En el Anexo 2. Se muestran los resultados del análisis y diseño de la propuesta de intervención de la estructura existente.

14. ANEXO 1
14.1 LOCAIZACION Y DATOS SISMICOS.

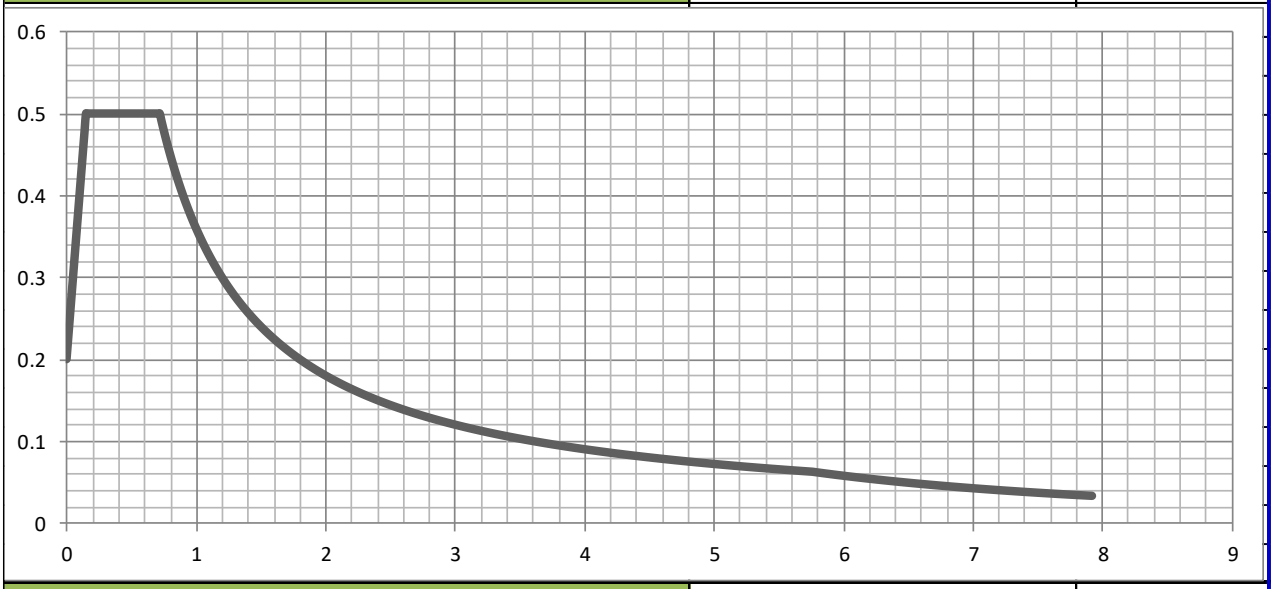
DATOS DE ENTRADA		REF. en la NSR-10
DEPARTAMENTO =	Bolívar	
LOCALIZACION GEOGRAFICA =	Cartagena	**CAP. A.2**
GRUPO DE USO =	III	**A.2.5.1.2**
TIPO DE SUELO =	D (Suelos rigidos)	**Tabla A.2.4-1**
SISTEMA ETRUCTURAL =	SISTEMA DE PÓRTICO RESISTENTE A MOMENTOS	**A.3.2.1.3**
MATERIAL =	CONCRETO ESTRUCTURAL	
NUMERO DE PISOS =	5	
ALTURA TOTAL =	18.00 m	
Capacidad de Disipación de Energía:	DMO	
Coeficiente de Capacidad de Disipación de Energía Básico (R0):	5.0	**Tab A.3-3**
Coeficiente de Reducción (ϕa):	0.9	**Tab A.3-7**
Coeficiente de Reducción (ϕp):	0.9	**Tab A.3-6**
Coeficiente de Reducción (ϕr):	1.0	**A.3.3.8**
Energía de Diseño (R = ϕa*ϕp*ϕr*R0):	4.1	**A.3.3-1**
METODO DE ANALISIS		
MÉTODO DE ANÁLISIS A UTILIZAR =	Método del análisis dinámico elástico	**A.3.4.2.2**
DEFINICION DE LOS MOVIMIENTOS SISMICOS		
COEFICIENTE DE IMPORTANCIA (I) =	1.25	**Tab A.2.5-1**
ZONA DE AMENAZA SISMICA =	Baja	**Fig A.2.3-1**
ACELERACION PICO EFECTIVA (Aa) =	0.1	**Fig A.2.3-2**
VELOCIDAD PICO EFECTIVA (Av) =	0.1	**Fig A.2.3-3**
COEFICIENTE DE AMPLIFICACION (Fa) =	1.6	**Tab A.2.4-3**
COEFICIENTE DE AMPLIFICACION (Fv) =	2.4	**Tab A.2.4-4**
PERIODOS DE VIBRACION		
Tc =	0.72 s	**A.2.6.1.1**
Tl =	5.76 s	**A.2.6.1.2**
To =	0.15 s	**A.2.6.1.3**

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Tabla 1: DATOS DEL PROYECTO

ESPECTRO DE DISEÑO		



PERIODO FUNDAMENTAL DE LA ETRUCTURA		
Cu =	1.462	**Ecu. A.4.2-2**
Ct =	0.047	**Tab A.2.4-1**
α =	0.9	**Tab A.2.4-1**
Ta =	0.634 s	**Ecu. A.4.2-3**
Cu*Ta =	0.926 s	**A.4.2.1**
k =	1.2	**A.4.3.2**
Sa =	0.389	**A.2.6**
WT =	3017.50 Tn	
CORTANTE SISMICO EN LA BASE		
V =	1172.63 Tn	**A.4.3-1**
FACTOR DE CORRECCION MODAL		fac d esc
Vdx =	950.52	**0.986934126**
Vdy =	1049.20	**0.894110394**

Tabla 2: ESPECTRO Y PERIODO DE LA ESTRUCTURA

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14.2 CORTANTE FUERZA HORIZONTAL EQUIVALENTE.

NIVEL SISMICOS	ALTURA, hx (m.)	PESO, W (Tn)	h^k (m)	W*h^k (Tn-m)	Cv (%)	Fuerza (Tn)	S Fuerza Cortante
5	18.00	310.736	33.3	10358.0	0.2	229.1	229.1
4	14.40	748.252	25.4	19026.7	0.4	420.8	649.9
3	10.80	720.017	17.937	12914.6775	0.24	285.624	935.5
2	7.20	779.695	10.968	8551.32008	0.16	189.123	1124.6
1	3.60	458.801	4.730	2170.32997	0.04	48.000	1172.6
Σ =		3017.5		53021.1	1.0	1172.6	

Tabla 3: CORTANTE FHE

14.3 EVALUACION DE LA DERIVA MAXIMA.

NIVEL	Desplazamiento		Delta		deriva		CHEKEO	
SISMICOS	x (m)	y (m)	Δx	Δy	δx	δy	EN X	EN Y
5	0.11000	0.0924	0.0135	0.0132	0.0038	0.0037	ok	ok
4	0.09650	0.0792	0.0153	0.0152	0.0043	0.0042	ok	ok
3	0.08120	0.064	0.0279	0.021	0.0078	0.0058	ok	ok
2	0.05330	0.043	0.0328	0.0243	0.0091	0.0068	ok	ok
1	0.02050	0.0187	0.0205	0.0187	0.0057	0.0052	ok	ok

Tabla 4: DERIVAS SISMICAS EN X, Y

14.4 CONTROL DATA

```
Panel Zone Effect :  Do not Calculate

Unit System       :  TONF, M

Definition of Frame

    - X Direction of Frame  :  Braced I Non-sway

    - Y Direction of Frame  :  Braced I Non-sway

    - Design Type           :  3-D

Design Code

    - Steel      :  AISC(14th)-LRFD10

    - Concrete   :  NSR-10

    - SRC        :  SSRC79
```

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14.5 LOAD CASE DATA

NO	NAME	TYPE	SELF WEIGHT FACTOR X	Y	Z	DESCRIPTION
1	PP	D	0.000	0.000	-1.000	Peso Propio
2	SCP	D	0.000	0.000	0.000	Sobre Carga Permanente
3	CV	L	0.000	0.000	0.000	Carga Viva
4	VX	W	0.000	0.000	0.000	Viento en X
5	VY	W	0.000	0.000	0.000	Viento en Y
6	SX	E	0.000	0.000	0.000	Sismo en X
7	SY	E	0.000	0.000	0.000	Sismo en Y

14.6 MATERIAL PROPERTY DATA

NO	NAME	TYPE	MODULUS OF ELASTICITY	SHEAR MODULUS	THERMAL COEFF.	POISSON RATIO	WEIGHT DENSITY
1	Grade C5000	CONC	2.865e+006	1.194e+006	5e-006	0.2	2.403

NO	NAME	TYPE	STRENGTH OF DESIGN MATERIAL STEEL	CONCRETE	MAIN REBAR	SUB REBAR
1	Grade C5000	CONC	-	3515	4.218e+004	4.218e+004

14.7 STORY DATA

NAME	LEVEL	HEIGHT	FLOOR DIAPHRAGM
Roof	18.00	0.000	Consider
5F	14.40	3.600	Consider
4F	10.80	3.600	Consider
3F	7.200	3.600	Consider
2F	3.600	3.600	Consider
1F	0.600	3.600	Do not consider

14.8 NODE DATA

NO	X	Y	Z	TEMPERATURE
1	4.282	0.4	7.2	0
2	4.282	28.02	7.2	0
3	6.347	0.4	7.2	0
4	6.347	28.02	7.2	0
5	8.462	0.4	7.2	0
6	8.462	28.02	7.2	0
7	10.57	0.4	7.2	0
8	10.57	28.02	7.2	0
9	12.64	0.4	7.2	0

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10	12.64	28.02	7.2	0
11	14.7	0.4	7.2	0
12	14.7	28.02	7.2	0
13	16.76	0.4	7.2	0
14	16.76	33.45	7.2	0
15	18.11	0.4	7.2	0
16	18.11	19.7	7.2	0
17	20.53	0.4	7.2	0
18	20.53	20.17	7.2	0
19	22.96	0.4	7.2	0
20	22.96	33.45	7.2	0
21	24.31	0.4	7.2	0
22	24.31	33.45	7.2	0
23	2.217	1.775	7.2	0
24	2.217	7	7.2	0
25	0	1.775	7.2	0
26	0.1839	28.02	7.2	0
27	24.31	1.775	7.2	0
28	0.03661	7	7.2	0
29	24.31	7	7.2	0
30	0.05008	8.924	7.2	0
31	4.282	8.924	7.2	0
32	2.791	7	7.2	0
33	2.791	8.924	7.2	0
34	0.1256	19.7	7.2	0
35	24.31	19.7	7.2	0
36	0.0716	11.99	7.2	0
37	24.31	11.99	7.2	0
38	24.31	28.02	7.2	0
39	13.46	28.02	7.2	0
40	13.46	33.45	7.2	0
41	15.16	28.02	7.2	0
42	15.16	32.65	7.2	0
43	12.76	32.65	7.2	0
44	24.31	32.65	7.2	0
45	18.76	19.7	7.2	0
46	18.76	32.65	7.2	0
47	20.83	23.1	7.2	0
48	20.83	32.65	7.2	0
49	18.76	23.1	7.2	0
50	22.96	23.1	7.2	0
51	18.76	20.17	7.2	0
52	22.96	20.17	7.2	0
53	14.7	20.5	7.2	0
54	16.76	20.5	7.2	0
55	15.51	19.7	7.2	0
56	15.51	20.5	7.2	0
57	2.217	11.99	7.2	0
58	2.217	28.02	7.2	0
59	4.282	1.775	7.2	0
60	4.282	7	7.2	0
61	4.282	11.99	7.2	0
62	4.282	19.7	7.2	0
63	6.347	1.775	7.2	0
64	6.347	7	7.2	0
65	6.347	11.99	7.2	0
66	6.347	19.7	7.2	0
67	8.462	1.775	7.2	0
68	8.462	7	7.2	0
69	8.462	11.99	7.2	0
70	8.462	19.7	7.2	0
71	10.57	1.775	7.2	0
72	10.57	7	7.2	0
73	10.57	11.99	7.2	0
74	10.57	19.7	7.2	0
75	12.64	1.775	7.2	0
76	12.64	7	7.2	0
77	12.64	11.99	7.2	0
78	12.64	19.7	7.2	0
79	14.7	1.775	7.2	0
80	14.7	7	7.2	0

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81	14.7	11.99	7.2	0
82	14.7	19.7	7.2	0
83	16.76	1.775	7.2	0
84	16.76	7	7.2	0
85	16.76	11.99	7.2	0
86	16.76	19.7	7.2	0
87	16.76	28.02	7.2	0
88	16.76	32.65	7.2	0
89	18.11	1.775	7.2	0
90	18.11	7	7.2	0
91	18.11	11.99	7.2	0
92	20.53	1.775	7.2	0
93	20.53	7	7.2	0
94	20.53	11.99	7.2	0
95	20.53	19.7	7.2	0
96	22.96	1.775	7.2	0
97	22.96	7	7.2	0
98	22.96	11.99	7.2	0
99	22.96	19.7	7.2	0
100	22.96	28.02	7.2	0
101	22.96	32.65	7.2	0
102	2.217	19.7	7.2	0
103	13.46	32.65	7.2	0
104	18.76	28.02	7.2	0
105	20.83	28.02	7.2	0
106	0	1.775	0	0
107	0.03661	7	0	0
108	0.0716	11.99	0	0
109	0.1256	19.7	0	0
110	0.1839	28.02	0	0
111	8.462	1.775	0	0
112	8.462	7	0	0
113	8.462	11.99	0	0
114	8.462	19.7	0	0
115	8.462	28.02	0	0
116	18.11	1.775	0	0
117	22.96	1.775	0	0
119	22.96	7	0	0
120	18.11	11.99	0	0
121	22.96	11.99	0	0
122	22.96	19.7	0	0
123	22.96	28.02	0	0
124	22.96	32.65	0	0
125	16.76	32.65	0	0
126	16.76	28.02	0	0
127	16.76	19.7	0	0
128	13.46	32.65	0	0
129	4.282	0.4	14.4	0
130	4.282	1.775	14.4	0
131	4.282	8.924	14.4	0
132	4.282	11.99	14.4	0
133	6.347	0.4	14.4	0
134	6.347	1.775	14.4	0
135	8.462	0.4	14.4	0
136	8.462	1.775	14.4	0
137	10.57	0.4	14.4	0
138	10.57	1.775	14.4	0
139	12.64	0.4	14.4	0
140	12.64	1.775	14.4	0
141	14.7	0.4	14.4	0
142	14.7	1.775	14.4	0
144	14.7	28.02	14.4	0
145	16.76	0.4	14.4	0
146	16.76	1.775	14.4	0
148	16.76	28.02	14.4	0
149	18.11	0.4	14.4	0
150	18.11	1.775	14.4	0
151	20.53	0.4	14.4	0
152	20.53	1.775	14.4	0
153	22.96	0.4	14.4	0
154	22.96	1.775	14.4	0

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157	22.96	28.02	14.4	0
158	24.31	0.4	14.4	0
159	24.31	1.775	14.4	0
160	24.31	7	14.4	0
161	24.31	11.99	14.4	0
162	24.31	19.7	14.4	0
163	24.31	28.02	14.4	0
166	2.217	1.775	14.4	0
167	2.217	7	14.4	0
168	0	1.775	14.4	0
169	0.03661	7	14.4	0
170	0.05008	8.924	14.4	0
171	0.0716	11.99	14.4	0
172	0.1256	19.7	14.4	0
173	0.1839	28.02	14.4	0
174	2.791	7	14.4	0
175	4.282	7	14.4	0
176	2.791	8.924	14.4	0
177	2.217	19.7	14.4	0
179	16.76	19.7	14.4	0
180	18.11	19.7	14.4	0
182	20.53	19.7	14.4	0
183	2.217	11.99	14.4	0
184	2.217	28.02	14.4	0
185	4.282	28.02	14.4	0
186	6.347	28.02	14.4	0
187	8.462	28.02	14.4	0
188	10.57	28.02	14.4	0
189	12.64	28.02	14.4	0
206	6.347	7	14.4	0
207	4.282	19.7	14.4	0
208	6.347	11.99	14.4	0
209	6.347	19.7	14.4	0
210	8.462	7	14.4	0
211	8.462	11.99	14.4	0
212	8.462	19.7	14.4	0
213	10.57	7	14.4	0
214	10.57	11.99	14.4	0
215	10.57	19.7	14.4	0
216	12.64	7	14.4	0
217	12.64	11.99	14.4	0
218	12.64	19.7	14.4	0
219	14.7	7	14.4	0
220	14.7	11.99	14.4	0
221	14.7	19.7	14.4	0
222	16.76	7	14.4	0
223	16.76	11.99	14.4	0
224	18.11	7	14.4	0
225	18.11	11.99	14.4	0
227	20.53	7	14.4	0
228	20.53	11.99	14.4	0
229	22.96	7	14.4	0
230	22.96	11.99	14.4	0
231	22.96	19.7	14.4	0
235	20.53	28.02	14.4	0
237	18.65	28.02	14.4	0
238	18.65	19.7	14.4	0
239	4.282	0.4	10.8	0
240	4.282	1.775	10.8	0
241	4.282	8.924	10.8	0
242	4.282	11.99	10.8	0
243	6.347	0.4	10.8	0
244	6.347	1.775	10.8	0
245	8.462	0.4	10.8	0
246	8.462	1.775	10.8	0
247	10.57	0.4	10.8	0
248	10.57	1.775	10.8	0
249	12.64	0.4	10.8	0
250	12.64	1.775	10.8	0
251	14.7	0.4	10.8	0
252	14.7	1.775	10.8	0

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253	14.7	20.5	10.8	0
254	14.7	28.02	10.8	0
255	16.76	0.4	10.8	0
256	16.76	1.775	10.8	0
257	16.76	20.5	10.8	0
258	16.76	28.02	10.8	0
259	18.11	0.4	10.8	0
260	18.11	1.775	10.8	0
261	20.53	0.4	10.8	0
262	20.53	1.775	10.8	0
263	22.96	0.4	10.8	0
264	22.96	1.775	10.8	0
265	22.96	20.17	10.8	0
266	22.96	23.1	10.8	0
267	22.96	28.02	10.8	0
268	24.31	0.4	10.8	0
269	24.31	1.775	10.8	0
270	24.31	7	10.8	0
271	24.31	11.99	10.8	0
272	24.31	19.7	10.8	0
273	24.31	28.02	10.8	0
276	2.217	1.775	10.8	0
277	2.217	7	10.8	0
278	0	1.775	10.8	0
279	0.03661	7	10.8	0
280	0.05008	8.924	10.8	0
281	0.0716	11.99	10.8	0
282	0.1256	19.7	10.8	0
283	0.1839	28.02	10.8	0
284	2.791	7	10.8	0
285	4.282	7	10.8	0
286	2.791	8.924	10.8	0
287	2.217	19.7	10.8	0
288	15.51	19.7	10.8	0
289	16.76	19.7	10.8	0
290	18.11	19.7	10.8	0
291	18.76	19.7	10.8	0
292	20.53	19.7	10.8	0
293	2.217	11.99	10.8	0
294	2.217	28.02	10.8	0
295	4.282	28.02	10.8	0
296	6.347	28.02	10.8	0
297	8.462	28.02	10.8	0
298	10.57	28.02	10.8	0
299	12.64	28.02	10.8	0
309	18.76	20.17	10.8	0
310	18.76	23.1	10.8	0
311	18.76	28.02	10.8	0
312	20.83	23.1	10.8	0
313	20.83	28.02	10.8	0
314	20.53	20.17	10.8	0
315	15.51	20.5	10.8	0
316	6.347	7	10.8	0
317	4.282	19.7	10.8	0
318	6.347	11.99	10.8	0
319	6.347	19.7	10.8	0
320	8.462	7	10.8	0
321	8.462	11.99	10.8	0
322	8.462	19.7	10.8	0
323	10.57	7	10.8	0
324	10.57	11.99	10.8	0
325	10.57	19.7	10.8	0
326	12.64	7	10.8	0
327	12.64	11.99	10.8	0
328	12.64	19.7	10.8	0
329	14.7	7	10.8	0
330	14.7	11.99	10.8	0
331	14.7	19.7	10.8	0
332	16.76	7	10.8	0
333	16.76	11.99	10.8	0
334	18.11	7	10.8	0

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335	18.11	11.99	10.8	0
337	20.53	7	10.8	0
338	20.53	11.99	10.8	0
339	22.96	7	10.8	0
340	22.96	11.99	10.8	0
341	22.96	19.7	10.8	0
345	4.282	11.99	18	0
377	2.217	7	18	0
379	0.03661	7	18	0
381	0.0716	11.99	18	0
382	0.1256	19.7	18	0
385	4.282	7	18	0
387	2.217	19.7	18	0
389	16.76	19.7	18	0
390	18.11	19.7	18	0
392	2.217	11.99	18	0
402	6.347	7	18	0
403	4.282	19.7	18	0
404	6.347	11.99	18	0
405	6.347	19.7	18	0
406	8.462	7	18	0
407	8.462	11.99	18	0
408	8.462	19.7	18	0
409	10.57	7	18	0
410	10.57	11.99	18	0
411	10.57	19.7	18	0
412	12.64	7	18	0
413	12.64	11.99	18	0
414	12.64	19.7	18	0
415	14.7	7	18	0
416	14.7	11.99	18	0
417	14.7	19.7	18	0
418	16.76	7	18	0
419	16.76	11.99	18	0
420	18.11	7	18	0
421	18.11	11.99	18	0
430	2.217	4.6	18	0
432	4.282	4.6	18	0
433	6.347	4.6	18	0
434	8.462	4.6	18	0
435	10.57	4.6	18	0
436	12.64	4.6	18	0
437	14.7	4.6	18	0
438	16.76	4.6	18	0
439	18.11	4.6	18	0
444	0.01979	4.6	18	0
446	2.217	22.1	18	0
447	0.1424	22.1	18	0
449	16.76	22.1	18	0
452	4.282	22.1	18	0
453	6.347	22.1	18	0
454	8.462	22.1	18	0
455	10.57	22.1	18	0
456	12.64	22.1	18	0
457	14.7	22.1	18	0
461	19.15	7	18	0
462	19.15	11.99	18	0
463	19.15	19.7	18	0
464	19.15	4.6	18	0
466	18.11	22.1	18	0
468	19.15	22.1	18	0
470	2.217	29.39	14.4	0
471	4.282	29.39	14.4	0
472	6.347	29.39	14.4	0
473	8.462	29.39	14.4	0
474	10.57	29.39	14.4	0
475	12.64	29.39	14.4	0
476	14.7	29.39	14.4	0
477	16.76	29.39	14.4	0
478	18.65	29.39	14.4	0
479	22.96	29.39	14.4	0

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480	24.31	29.39	14.4	0
481	20.53	29.39	14.4	0
484	0.1935	29.39	14.4	0
485	4.282	0.4	3.6	0
486	4.282	1.775	3.6	0
487	4.282	8.924	3.6	0
488	4.282	11.99	3.6	0
489	6.347	0.4	3.6	0
490	6.347	1.775	3.6	0
491	8.462	0.4	3.6	0
492	8.462	1.775	3.6	0
499	14.7	20.5	3.6	0
500	14.7	28.02	3.6	0
503	16.76	20.5	3.6	0
504	16.76	28.02	3.6	0
510	22.96	1.775	3.6	0
511	22.96	20.17	3.6	0
512	22.96	23.1	3.6	0
513	22.96	28.02	3.6	0
522	2.217	1.775	3.6	0
523	2.217	7	3.6	0
524	1.539e-009	1.775	3.6	0
525	0.03661	7	3.6	0
526	0.05008	8.924	3.6	0
527	0.0716	11.99	3.6	0
528	0.1256	19.7	3.6	0
529	0.1839	28.02	3.6	0
530	2.791	7	3.6	0
531	4.282	7	3.6	0
532	2.791	8.924	3.6	0
533	2.217	19.7	3.6	0
534	15.51	19.7	3.6	0
535	16.76	19.7	3.6	0
537	18.76	19.7	3.6	0
538	20.53	19.7	3.6	0
539	2.217	11.99	3.6	0
540	2.217	28.02	3.6	0
541	4.282	28.02	3.6	0
542	6.347	28.02	3.6	0
543	8.462	28.02	3.6	0
544	10.57	28.02	3.6	0
545	12.64	28.02	3.6	0
546	13.46	28.02	3.6	0
547	15.16	28.02	3.6	0
548	13.46	32.65	3.6	0
549	15.16	32.65	3.6	0
550	12.76	32.65	3.6	0
551	16.76	32.65	3.6	0
552	18.76	32.65	3.6	0
553	20.83	32.65	3.6	0
554	22.96	32.65	3.6	0
555	18.76	20.17	3.6	0
556	18.76	23.1	3.6	0
557	18.76	28.02	3.6	0
558	20.83	23.1	3.6	0
559	20.83	28.02	3.6	0
560	20.53	20.17	3.6	0
561	15.51	20.5	3.6	0
562	6.347	7	3.6	0
563	4.282	19.7	3.6	0
564	6.347	11.99	3.6	0
565	6.347	19.7	3.6	0
566	8.462	7	3.6	0
567	8.462	11.99	3.6	0
568	8.462	19.7	3.6	0
571	10.57	19.7	3.6	0
574	12.64	19.7	3.6	0
577	14.7	19.7	3.6	0
585	22.96	7	3.6	0
586	22.96	11.99	3.6	0
587	22.96	19.7	3.6	0

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589	13.46	33.45	3.6	0
591	16.76	23.1	3.6	0
592	8.462	23.1	3.6	0
593	10.57	23.1	3.6	0
594	12.64	23.1	3.6	0
595	14.7	23.1	3.6	0
596	0.05008	8.924	18	0
597	2.791	8.924	18	0
598	2.217	8.924	18	0
599	4.282	8.924	18	0
600	2.791	7	18	0

14.9 SUPPORT / SPECIFIED DISPLACEMENT / POINT SPRING SUPPORT

** SUPPORT / SPECIFIED DISPLACEMENT

NODE	SUPPORT	SPECIFIED DISPLACEMENT					
	DDDRRR	Dx	Dy	Dz	Rx	Ry	Rz
106	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
107	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
108	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
109	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
110	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
111	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
112	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
113	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
114	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
115	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
116	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
117	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
119	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
120	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
121	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
122	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
123	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
124	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
125	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
126	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
127	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
128	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

14.10 FLOOR DIAPHRAGM / RIGID LINK DATA

MASTER	DDDRRR	NODES OF SAME DISPLACEMENT
Roof Floor Diaphragm		345 377to389by4 379 382 387 390 392 402to421 430 432to439 444 446 447 449 452to457 461to464 466 468 596to600
5F Floor Diaphragm		129to142 144to146 148to154 157to163 166to177 179 180 182to189 206to225 227to231 235 237 238 470to481 484
4F Floor Diaphragm		239to273 276to299 309to335 337to341
3F Floor Diaphragm		1to105
2F Floor Diaphragm		485to492 499 500 503 504 510to513 522to535 537to568 571 574 577 585to587 589 591to595

14.11 SECTION PROPERTY DATA

NO	NAME	SHAPE	H	B	tw	tf1	r1

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1	C70	SR	0.7	0	0	0	0
2	C50X55	SB	0.55	0.5	0	0	0
3	C50X50	SB	0.5	0.5	0	0	0
4	C40X40	SB	0.4	0.4	0	0	0
5	V15X50	SB	0.5	0.15	0	0	0
6	V20X50	SB	0.5	0.2	0	0	0
7	V25X50	SB	0.5	0.25	0	0	0
8	V30X50	SB	0.5	0.3	0	0	0
9	V35X50	SB	0.5	0.35	0	0	0
10	V40X50	SB	0.5	0.4	0	0	0
11	V42X50	SB	0.5	0.42	0	0	0
12	V45X50	SB	0.5	0.45	0	0	0
13	V50X50	SB	0.5	0.5	0	0	0

NO	NAME	STIFFNESS SCALE FACTOR							
		A	Asy	Asz	Ix	Iy	Iz	W	Boundary Group
1	C70								
2	C50X55								
3	C50X50								
4	C40X40								
5	V15X50								
6	V20X50								
7	V25X50								
8	V30X50								
9	V35X50								
10	V40X50								
11	V42X50								
12	V45X50								
13	V50X50								

NO	NAME	AREA	MOMENT OF INERTIA			SHAPE FACTOR	
		[SRC:EQIV.]	Ix	Iy	Iz	k-Y	k-Z
1	C70	0.3848	0.02357	0.01179	0.01179	0.9	0.9
2	C50X55	0.275	0.01054	0.006932	0.005729	0.8333	0.8333
3	C50X50	0.25	0.008789	0.005208	0.005208	0.8333	0.8333
4	C40X40	0.16	0.0036	0.002133	0.002133	0.8333	0.8333
5	V15X50	0.075	0.0004563	0.001562	0.0001406	0.8333	0.8333
6	V20X50	0.1	0.0009981	0.002083	0.0003333	0.8333	0.8333
7	V25X50	0.125	0.001788	0.002604	0.000651	0.8333	0.8333
8	V30X50	0.15	0.002817	0.003125	0.001125	0.8333	0.8333
9	V35X50	0.175	0.004058	0.003646	0.001786	0.8333	0.8333
10	V40X50	0.2	0.005474	0.004167	0.002667	0.8333	0.8333
11	V42X50	0.21	0.006085	0.004375	0.003087	0.8333	0.8333
12	V45X50	0.225	0.007047	0.004687	0.003797	0.8333	0.8333
13	V50X50	0.25	0.008789	0.005208	0.005208	0.8333	0.8333

NO	NAME	SECTION MODULUS Sy		SECTION MODULUS Sz	
		I or CONC.	J or STEEL	I or CONC.	J or STEEL
1	C70	0.03367	0.03367	0.03367	0.03367
2	C50X55	0.02521	0.02521	0.02292	0.02292
3	C50X50	0.02083	0.02083	0.02083	0.02083
4	C40X40	0.01067	0.01067	0.01067	0.01067
5	V15X50	0.00625	0.00625	0.001875	0.001875
6	V20X50	0.008333	0.008333	0.003333	0.003333
7	V25X50	0.01042	0.01042	0.005208	0.005208

8	V30X50	0.0125	0.0125	0.0075	0.0075
9	V35X50	0.01458	0.01458	0.01021	0.01021
10	V40X50	0.01667	0.01667	0.01333	0.01333
11	V42X50	0.0175	0.0175	0.0147	0.0147
12	V45X50	0.01875	0.01875	0.01688	0.01688
13	V50X50	0.02083	0.02083	0.02083	0.02083

14.12 BEAM MEMBER DATA

NO	NODAL CONNECTIVITY		BEAM END RELEASE		MATERIAL	SECTION	LENGTH
	I	J	I	J			
1	1	59	-	-	Grade C5000	V42X50	1.375
2	31	61	-	-	Grade C5000	V30X50	3.071
3	3	63	-	-	Grade C5000	V30X50	1.375
4	5	67	-	-	Grade C5000	V40X50	1.375
5	7	71	-	-	Grade C5000	V30X50	1.375
6	9	75	-	-	Grade C5000	V30X50	1.375
7	11	79	-	-	Grade C5000	V30X50	1.375
8	53	12	-	-	Grade C5000	V30X50	7.524
9	13	83	-	-	Grade C5000	V30X50	1.375
10	54	87	-	-	Grade C5000	V40X50	7.524
11	15	89	-	-	Grade C5000	V50X50	1.375
12	17	92	-	-	Grade C5000	V30X50	1.375
13	19	96	-	-	Grade C5000	V40X50	1.375
14	52	50	-	-	Grade C5000	V30X50	2.925
15	50	100	-	-	Grade C5000	V40X50	4.924
16	21	27	-	-	Grade C5000	V30X50	1.375
17	27	29	-	-	Grade C5000	V30X50	5.225
18	29	37	-	-	Grade C5000	V30X50	4.995
19	37	35	-	-	Grade C5000	V30X50	7.705
20	35	38	-	-	Grade C5000	V30X50	8.324
21	38	44	-	-	Grade C5000	V30X50	4.625
22	44	22	-	-	Grade C5000	V30X50	0.8
23	23	24	-	-	Grade C5000	V30X50	5.225
24	25	28	-	-	Grade C5000	V40X50	5.225
25	28	30	-	-	Grade C5000	V40X50	1.924
26	30	36	-	-	Grade C5000	V30X50	3.071
27	36	34	-	-	Grade C5000	V40X50	7.706
28	34	26	-	-	Grade C5000	V40X50	8.324
29	25	23	-	-	Grade C5000	V45X50	2.217
30	23	59	-	-	Grade C5000	V45X50	2.065
31	1	3	-	-	Grade C5000	V30X50	2.065
32	3	5	-	-	Grade C5000	V30X50	2.115
33	5	7	-	-	Grade C5000	V30X50	2.112
34	7	9	-	-	Grade C5000	V30X50	2.063
35	9	11	-	-	Grade C5000	V30X50	2.063
36	11	13	-	-	Grade C5000	V30X50	2.063
37	13	15	-	-	Grade C5000	V30X50	1.348
38	15	17	-	-	Grade C5000	V30X50	2.424
39	17	19	-	-	Grade C5000	V30X50	2.424
40	19	21	-	-	Grade C5000	V30X50	1.35
41	28	24	-	-	Grade C5000	V50X50	2.18
42	24	32	-	-	Grade C5000	V50X50	0.5739
43	32	60	-	-	Grade C5000	V50X50	1.491
44	30	33	-	-	Grade C5000	V25X50	2.741
45	33	31	-	-	Grade C5000	V25X50	1.491
46	32	33	-	-	Grade C5000	V25X50	1.924
47	34	102	-	-	Grade C5000	V50X50	2.091
48	55	86	-	-	Grade C5000	V50X50	1.25
49	16	45	-	-	Grade C5000	V50X50	0.6477
50	45	95	-	-	Grade C5000	V50X50	1.776
51	36	57	-	-	Grade C5000	V50X50	2.145
52	57	61	-	-	Grade C5000	V50X50	2.065
53	26	58	-	-	Grade C5000	V45X50	2.033
54	58	2	-	-	Grade C5000	V45X50	2.065
55	2	4	-	-	Grade C5000	V45X50	2.065

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56	4	6	-	-	Grade C5000	V45X50	2.115
57	6	8	-	-	Grade C5000	V45X50	2.112
58	8	10	-	-	Grade C5000	V45X50	2.063
59	10	39	-	-	Grade C5000	V45X50	0.825
60	39	12	-	-	Grade C5000	V45X50	1.238
61	12	41	-	-	Grade C5000	V45X50	0.4602
62	41	87	-	-	Grade C5000	V45X50	1.602
63	39	103	-	-	Grade C5000	V40X50	4.625
64	41	42	-	-	Grade C5000	V30X50	4.625
65	43	103	-	-	Grade C5000	V40X50	0.7
66	42	88	-	-	Grade C5000	V40X50	1.602
67	46	48	-	-	Grade C5000	V40X50	2.075
68	48	101	-	-	Grade C5000	V40X50	2.125
69	45	51	-	-	Grade C5000	V30X50	0.475
70	51	49	-	-	Grade C5000	V30X50	2.925
71	49	104	-	-	Grade C5000	V30X50	4.924
72	47	105	-	-	Grade C5000	V30X50	4.924
73	49	47	-	-	Grade C5000	V30X50	2.075
74	47	50	-	-	Grade C5000	V30X50	2.125
75	51	18	-	-	Grade C5000	V15X50	1.776
76	18	52	-	-	Grade C5000	V15X50	2.424
77	53	56	-	-	Grade C5000	V20X50	0.8125
78	56	54	-	-	Grade C5000	V20X50	1.25
79	55	56	-	-	Grade C5000	V20X50	0.8
80	57	102	-	-	Grade C5000	V30X50	7.705
81	59	60	-	-	Grade C5000	V30X50	5.225
82	60	31	-	-	Grade C5000	V30X50	1.924
83	59	63	-	-	Grade C5000	V45X50	2.065
84	60	64	-	-	Grade C5000	V50X50	2.065
85	61	62	-	-	Grade C5000	V30X50	7.705
86	62	2	-	-	Grade C5000	V30X50	8.324
87	61	65	-	-	Grade C5000	V50X50	2.065
88	62	66	-	-	Grade C5000	V50X50	2.065
89	63	64	-	-	Grade C5000	V30X50	5.225
90	64	65	-	-	Grade C5000	V30X50	4.995
91	65	66	-	-	Grade C5000	V30X50	7.705
92	66	4	-	-	Grade C5000	V30X50	8.324
93	63	67	-	-	Grade C5000	V45X50	2.115
94	64	68	-	-	Grade C5000	V50X50	2.115
95	65	69	-	-	Grade C5000	V50X50	2.115
96	66	70	-	-	Grade C5000	V50X50	2.115
97	67	68	-	-	Grade C5000	V40X50	5.225
98	68	69	-	-	Grade C5000	V40X50	4.995
99	69	70	-	-	Grade C5000	V40X50	7.705
100	70	6	-	-	Grade C5000	V40X50	8.324
101	67	71	-	-	Grade C5000	V45X50	2.112
102	68	72	-	-	Grade C5000	V50X50	2.112
103	69	73	-	-	Grade C5000	V50X50	2.112
104	70	74	-	-	Grade C5000	V50X50	2.112
105	71	72	-	-	Grade C5000	V30X50	5.225
106	72	73	-	-	Grade C5000	V30X50	4.995
107	73	74	-	-	Grade C5000	V30X50	7.705
108	74	8	-	-	Grade C5000	V30X50	8.324
109	71	75	-	-	Grade C5000	V45X50	2.063
110	72	76	-	-	Grade C5000	V50X50	2.063
111	73	77	-	-	Grade C5000	V50X50	2.063
112	74	78	-	-	Grade C5000	V50X50	2.063
113	75	76	-	-	Grade C5000	V30X50	5.225
114	76	77	-	-	Grade C5000	V30X50	4.995
115	77	78	-	-	Grade C5000	V30X50	7.705
116	78	10	-	-	Grade C5000	V30X50	8.324
117	75	79	-	-	Grade C5000	V45X50	2.063
118	76	80	-	-	Grade C5000	V50X50	2.063
119	77	81	-	-	Grade C5000	V50X50	2.063
120	78	82	-	-	Grade C5000	V50X50	2.063
121	79	80	-	-	Grade C5000	V30X50	5.225
122	80	81	-	-	Grade C5000	V30X50	4.995
123	81	82	-	-	Grade C5000	V30X50	7.705
124	82	53	-	-	Grade C5000	V30X50	0.8
125	79	83	-	-	Grade C5000	V45X50	2.063
126	80	84	-	-	Grade C5000	V50X50	2.063

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127	81	85	-	-	Grade C5000	V50X50	2.063
128	82	55	-	-	Grade C5000	V50X50	0.8125
129	83	84	-	-	Grade C5000	V30X50	5.225
130	84	85	-	-	Grade C5000	V30X50	4.995
131	85	86	-	-	Grade C5000	V40X50	7.705
132	86	54	-	-	Grade C5000	V40X50	0.8
133	83	89	-	-	Grade C5000	V45X50	1.348
134	84	90	-	-	Grade C5000	V50X50	1.348
135	85	91	-	-	Grade C5000	V50X50	1.348
136	86	16	-	-	Grade C5000	V50X50	1.348
137	87	88	-	-	Grade C5000	V40X50	4.625
138	88	14	-	-	Grade C5000	V40X50	0.8
139	87	104	-	-	Grade C5000	V45X50	1.995
140	88	46	-	-	Grade C5000	V40X50	1.995
141	89	90	-	-	Grade C5000	V50X50	5.225
142	90	91	-	-	Grade C5000	V50X50	4.995
143	91	16	-	-	Grade C5000	V40X50	7.705
144	89	92	-	-	Grade C5000	V45X50	2.424
145	90	93	-	-	Grade C5000	V50X50	2.424
146	91	94	-	-	Grade C5000	V50X50	2.424
147	92	93	-	-	Grade C5000	V30X50	5.225
148	93	94	-	-	Grade C5000	V30X50	4.995
149	94	95	-	-	Grade C5000	V30X50	7.705
150	95	18	-	-	Grade C5000	V30X50	0.475
151	92	96	-	-	Grade C5000	V45X50	2.424
152	93	97	-	-	Grade C5000	V50X50	2.424
153	94	98	-	-	Grade C5000	V50X50	2.424
154	95	99	-	-	Grade C5000	V50X50	2.424
155	96	97	-	-	Grade C5000	V40X50	5.225
156	97	98	-	-	Grade C5000	V40X50	4.995
157	98	99	-	-	Grade C5000	V40X50	7.705
158	99	52	-	-	Grade C5000	V40X50	0.475
159	96	27	-	-	Grade C5000	V45X50	1.35
160	97	29	-	-	Grade C5000	V50X50	1.35
161	98	37	-	-	Grade C5000	V50X50	1.35
162	99	35	-	-	Grade C5000	V50X50	1.35
163	100	101	-	-	Grade C5000	V40X50	4.625
164	101	20	-	-	Grade C5000	V40X50	0.8
165	100	38	-	-	Grade C5000	V45X50	1.35
166	101	44	-	-	Grade C5000	V40X50	1.35
167	102	62	-	-	Grade C5000	V50X50	2.065
168	102	58	-	-	Grade C5000	V30X50	8.324
169	103	40	-	-	Grade C5000	V40X50	0.8
170	103	42	-	-	Grade C5000	V40X50	1.698
171	104	46	-	-	Grade C5000	V30X50	4.625
172	104	105	-	-	Grade C5000	V45X50	2.075
173	105	48	-	-	Grade C5000	V30X50	4.625
174	105	100	-	-	Grade C5000	V45X50	2.125
175	106	524	-	-	Grade C5000	C50X55	3.6
176	107	525	-	-	Grade C5000	C50X55	3.6
177	108	527	-	-	Grade C5000	C50X55	3.6
178	109	528	-	-	Grade C5000	C50X55	3.6
179	110	529	-	-	Grade C5000	C50X55	3.6
180	111	492	-	-	Grade C5000	C50X55	3.6
181	112	566	-	-	Grade C5000	C50X55	3.6
182	113	567	-	-	Grade C5000	C50X55	3.6
183	114	568	-	-	Grade C5000	C50X55	3.6
184	115	543	-	-	Grade C5000	C50X55	3.6
185	116	89	-	-	Grade C5000	C70	7.2
186	117	510	-	-	Grade C5000	C50X55	3.6
188	119	585	-	-	Grade C5000	C50X55	3.6
189	120	91	-	-	Grade C5000	C70	7.2
190	121	586	-	-	Grade C5000	C50X55	3.6
191	122	587	-	-	Grade C5000	C50X55	3.6
192	123	513	-	-	Grade C5000	C50X55	3.6
193	124	554	-	-	Grade C5000	C40X40	3.6
194	125	551	-	-	Grade C5000	C40X40	3.6
195	126	504	-	-	Grade C5000	C50X55	3.6
196	127	535	-	-	Grade C5000	C50X55	3.6
197	128	548	-	-	Grade C5000	C40X40	3.6
198	129	130	-	-	Grade C5000	V42X50	1.375

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199	131	132	-	-	Grade C5000	V30X50	3.071
200	133	134	-	-	Grade C5000	V30X50	1.375
201	135	136	-	-	Grade C5000	V40X50	1.375
202	137	138	-	-	Grade C5000	V30X50	1.375
203	139	140	-	-	Grade C5000	V30X50	1.375
204	141	142	-	-	Grade C5000	V30X50	1.375
205	221	144	-	-	Grade C5000	V30X50	8.324
206	145	146	-	-	Grade C5000	V30X50	1.375
207	179	148	-	-	Grade C5000	V40X50	8.324
208	149	150	-	-	Grade C5000	V50X50	1.375
209	151	152	-	-	Grade C5000	V30X50	1.375
210	153	154	-	-	Grade C5000	V40X50	1.375
211	231	157	-	-	Grade C5000	V40X50	8.324
213	158	159	-	-	Grade C5000	V30X50	1.375
214	159	160	-	-	Grade C5000	V30X50	5.225
215	160	161	-	-	Grade C5000	V30X50	4.995
216	161	162	-	-	Grade C5000	V30X50	7.705
217	162	163	-	-	Grade C5000	V30X50	8.324
220	166	167	-	-	Grade C5000	V30X50	5.225
221	168	169	-	-	Grade C5000	V40X50	5.225
222	169	170	-	-	Grade C5000	V40X50	1.924
223	170	171	-	-	Grade C5000	V30X50	3.071
224	171	172	-	-	Grade C5000	V40X50	7.706
225	172	173	-	-	Grade C5000	V40X50	8.324
226	168	166	-	-	Grade C5000	V45X50	2.217
227	166	130	-	-	Grade C5000	V45X50	2.065
228	129	133	-	-	Grade C5000	V30X50	2.065
229	133	135	-	-	Grade C5000	V30X50	2.115
230	135	137	-	-	Grade C5000	V30X50	2.112
231	137	139	-	-	Grade C5000	V30X50	2.063
232	139	141	-	-	Grade C5000	V30X50	2.063
233	141	145	-	-	Grade C5000	V30X50	2.063
234	145	149	-	-	Grade C5000	V30X50	1.348
235	149	151	-	-	Grade C5000	V30X50	2.424
236	151	153	-	-	Grade C5000	V30X50	2.424
237	153	158	-	-	Grade C5000	V30X50	1.35
238	169	167	-	-	Grade C5000	V50X50	2.18
239	167	174	-	-	Grade C5000	V50X50	0.5739
240	174	175	-	-	Grade C5000	V50X50	1.491
241	170	176	-	-	Grade C5000	V25X50	2.741
242	176	131	-	-	Grade C5000	V25X50	1.491
243	174	176	-	-	Grade C5000	V25X50	1.924
244	172	177	-	-	Grade C5000	V50X50	2.091
245	221	179	-	-	Grade C5000	V50X50	2.063
246	180	238	-	-	Grade C5000	V50X50	0.5381
248	171	183	-	-	Grade C5000	V50X50	2.145
249	183	132	-	-	Grade C5000	V50X50	2.065
250	173	184	-	-	Grade C5000	V45X50	2.033
251	184	185	-	-	Grade C5000	V45X50	2.065
252	185	186	-	-	Grade C5000	V45X50	2.065
253	186	187	-	-	Grade C5000	V45X50	2.115
254	187	188	-	-	Grade C5000	V45X50	2.112
255	188	189	-	-	Grade C5000	V45X50	2.063
256	189	144	-	-	Grade C5000	V45X50	2.063
258	144	148	-	-	Grade C5000	V45X50	2.063
277	183	177	-	-	Grade C5000	V30X50	7.705
278	130	175	-	-	Grade C5000	V30X50	5.225
279	175	131	-	-	Grade C5000	V30X50	1.924
280	130	134	-	-	Grade C5000	V45X50	2.065
281	175	206	-	-	Grade C5000	V50X50	2.065
282	132	207	-	-	Grade C5000	V30X50	7.705
283	207	185	-	-	Grade C5000	V30X50	8.324
284	132	208	-	-	Grade C5000	V50X50	2.065
285	207	209	-	-	Grade C5000	V50X50	2.065
286	134	206	-	-	Grade C5000	V30X50	5.225
287	206	208	-	-	Grade C5000	V30X50	4.995
288	208	209	-	-	Grade C5000	V30X50	7.705
289	209	186	-	-	Grade C5000	V30X50	8.324
290	134	136	-	-	Grade C5000	V45X50	2.115
291	206	210	-	-	Grade C5000	V50X50	2.115
292	208	211	-	-	Grade C5000	V50X50	2.115

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293	209	212	-	-	Grade C5000	V50X50	2.115
294	136	210	-	-	Grade C5000	V40X50	5.225
295	210	211	-	-	Grade C5000	V40X50	4.995
296	211	212	-	-	Grade C5000	V40X50	7.705
297	212	187	-	-	Grade C5000	V40X50	8.324
298	136	138	-	-	Grade C5000	V45X50	2.112
299	210	213	-	-	Grade C5000	V50X50	2.112
300	211	214	-	-	Grade C5000	V50X50	2.112
301	212	215	-	-	Grade C5000	V50X50	2.112
302	138	213	-	-	Grade C5000	V30X50	5.225
303	213	214	-	-	Grade C5000	V30X50	4.995
304	214	215	-	-	Grade C5000	V30X50	7.705
305	215	188	-	-	Grade C5000	V30X50	8.324
306	138	140	-	-	Grade C5000	V45X50	2.063
307	213	216	-	-	Grade C5000	V50X50	2.063
308	214	217	-	-	Grade C5000	V50X50	2.063
309	215	218	-	-	Grade C5000	V50X50	2.063
310	140	216	-	-	Grade C5000	V30X50	5.225
311	216	217	-	-	Grade C5000	V30X50	4.995
312	217	218	-	-	Grade C5000	V30X50	7.705
313	218	189	-	-	Grade C5000	V30X50	8.324
314	140	142	-	-	Grade C5000	V45X50	2.063
315	216	219	-	-	Grade C5000	V50X50	2.063
316	217	220	-	-	Grade C5000	V50X50	2.063
317	218	221	-	-	Grade C5000	V50X50	2.063
318	142	219	-	-	Grade C5000	V30X50	5.225
319	219	220	-	-	Grade C5000	V30X50	4.995
320	220	221	-	-	Grade C5000	V30X50	7.705
322	142	146	-	-	Grade C5000	V45X50	2.063
323	219	222	-	-	Grade C5000	V50X50	2.063
324	220	223	-	-	Grade C5000	V50X50	2.063
326	146	222	-	-	Grade C5000	V30X50	5.225
327	222	223	-	-	Grade C5000	V30X50	4.995
328	223	179	-	-	Grade C5000	V40X50	7.705
330	146	150	-	-	Grade C5000	V45X50	1.348
331	222	224	-	-	Grade C5000	V50X50	1.348
332	223	225	-	-	Grade C5000	V50X50	1.348
333	179	180	-	-	Grade C5000	V50X50	1.348
336	148	237	-	-	Grade C5000	V45X50	1.886
338	150	224	-	-	Grade C5000	V50X50	5.225
339	224	225	-	-	Grade C5000	V50X50	4.995
340	225	180	-	-	Grade C5000	V40X50	7.705
341	150	152	-	-	Grade C5000	V45X50	2.424
342	224	227	-	-	Grade C5000	V50X50	2.424
343	225	228	-	-	Grade C5000	V50X50	2.424
344	152	227	-	-	Grade C5000	V30X50	5.225
345	227	228	-	-	Grade C5000	V30X50	4.995
346	228	182	-	-	Grade C5000	V30X50	7.705
348	152	154	-	-	Grade C5000	V45X50	2.424
349	227	229	-	-	Grade C5000	V50X50	2.424
350	228	230	-	-	Grade C5000	V50X50	2.424
351	182	231	-	-	Grade C5000	V50X50	2.424
352	154	229	-	-	Grade C5000	V40X50	5.225
353	229	230	-	-	Grade C5000	V40X50	4.995
354	230	231	-	-	Grade C5000	V40X50	7.705
356	154	159	-	-	Grade C5000	V45X50	1.35
357	229	160	-	-	Grade C5000	V50X50	1.35
358	230	161	-	-	Grade C5000	V50X50	1.35
359	231	162	-	-	Grade C5000	V50X50	1.35
362	157	163	-	-	Grade C5000	V45X50	1.35
364	177	207	-	-	Grade C5000	V50X50	2.065
365	177	184	-	-	Grade C5000	V30X50	8.324
372	25	278	-	-	Grade C5000	C50X55	3.6
374	28	279	-	-	Grade C5000	C50X55	3.6
376	36	281	-	-	Grade C5000	C50X55	3.6
378	34	282	-	-	Grade C5000	C50X55	3.6
380	26	283	-	-	Grade C5000	C50X55	3.6
382	67	246	-	-	Grade C5000	C50X55	3.6
384	68	320	-	-	Grade C5000	C50X55	3.6
386	69	321	-	-	Grade C5000	C50X55	3.6
388	70	322	-	-	Grade C5000	C50X55	3.6

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390	6	297	-	-	Grade C5000	C50X55	3.6
392	89	260	-	-	Grade C5000	C50X50	3.6
394	96	264	-	-	Grade C5000	C50X55	3.6
396	97	339	-	-	Grade C5000	C50X55	3.6
398	91	335	-	-	Grade C5000	C50X50	3.6
400	98	340	-	-	Grade C5000	C50X55	3.6
402	99	341	-	-	Grade C5000	C50X55	3.6
404	100	267	-	-	Grade C5000	C50X55	3.6
410	87	258	-	-	Grade C5000	C50X55	3.6
412	86	289	-	-	Grade C5000	C50X55	3.6
415	90	334	-	-	Grade C5000	C50X50	3.6
416	182	235	-	-	Grade C5000	V30X50	8.324
418	235	157	-	-	Grade C5000	V45X50	2.424
421	237	235	-	-	Grade C5000	V45X50	1.886
422	238	237	-	-	Grade C5000	V30X50	8.324
423	238	182	-	-	Grade C5000	V50X50	1.886
425	239	240	-	-	Grade C5000	V42X50	1.375
426	241	242	-	-	Grade C5000	V30X50	3.071
427	243	244	-	-	Grade C5000	V30X50	1.375
428	245	246	-	-	Grade C5000	V40X50	1.375
429	246	136	-	-	Grade C5000	C50X55	3.6
430	247	248	-	-	Grade C5000	V30X50	1.375
431	249	250	-	-	Grade C5000	V30X50	1.375
432	251	252	-	-	Grade C5000	V30X50	1.375
433	253	254	-	-	Grade C5000	V30X50	7.524
434	255	256	-	-	Grade C5000	V30X50	1.375
435	257	258	-	-	Grade C5000	V40X50	7.524
436	258	148	-	-	Grade C5000	C50X55	3.6
437	259	260	-	-	Grade C5000	V50X50	1.375
438	260	150	-	-	Grade C5000	C50X50	3.6
439	261	262	-	-	Grade C5000	V30X50	1.375
440	263	264	-	-	Grade C5000	V40X50	1.375
441	264	154	-	-	Grade C5000	C50X55	3.6
442	265	266	-	-	Grade C5000	V30X50	2.925
443	266	267	-	-	Grade C5000	V40X50	4.924
444	267	157	-	-	Grade C5000	C50X55	3.6
445	268	269	-	-	Grade C5000	V30X50	1.375
446	269	270	-	-	Grade C5000	V30X50	5.225
447	270	271	-	-	Grade C5000	V30X50	4.995
448	271	272	-	-	Grade C5000	V30X50	7.705
449	272	273	-	-	Grade C5000	V30X50	8.324
452	276	277	-	-	Grade C5000	V30X50	5.225
453	278	279	-	-	Grade C5000	V40X50	5.225
454	278	168	-	-	Grade C5000	C50X55	3.6
455	279	169	-	-	Grade C5000	C50X55	3.6
456	279	280	-	-	Grade C5000	V40X50	1.924
457	280	281	-	-	Grade C5000	V30X50	3.071
458	281	171	-	-	Grade C5000	C50X55	3.6
459	281	282	-	-	Grade C5000	V40X50	7.706
460	282	172	-	-	Grade C5000	C50X55	3.6
461	282	283	-	-	Grade C5000	V40X50	8.324
462	283	173	-	-	Grade C5000	C50X55	3.6
463	278	276	-	-	Grade C5000	V45X50	2.217
464	276	240	-	-	Grade C5000	V45X50	2.065
465	239	243	-	-	Grade C5000	V30X50	2.065
466	243	245	-	-	Grade C5000	V30X50	2.115
467	245	247	-	-	Grade C5000	V30X50	2.112
468	247	249	-	-	Grade C5000	V30X50	2.063
469	249	251	-	-	Grade C5000	V30X50	2.063
470	251	255	-	-	Grade C5000	V30X50	2.063
471	255	259	-	-	Grade C5000	V30X50	1.348
472	259	261	-	-	Grade C5000	V30X50	2.424
473	261	263	-	-	Grade C5000	V30X50	2.424
474	263	268	-	-	Grade C5000	V30X50	1.35
475	279	277	-	-	Grade C5000	V50X50	2.18
476	277	284	-	-	Grade C5000	V50X50	0.5739
477	284	285	-	-	Grade C5000	V50X50	1.491
478	280	286	-	-	Grade C5000	V25X50	2.741
479	286	241	-	-	Grade C5000	V25X50	1.491
480	284	286	-	-	Grade C5000	V25X50	1.924
481	282	287	-	-	Grade C5000	V50X50	2.091

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482	288	289	-	-	Grade C5000	V50X50	1.25
483	289	179	-	-	Grade C5000	C50X55	3.6
484	290	291	-	-	Grade C5000	V50X50	0.6477
485	291	292	-	-	Grade C5000	V50X50	1.776
486	281	293	-	-	Grade C5000	V50X50	2.145
487	293	242	-	-	Grade C5000	V50X50	2.065
488	283	294	-	-	Grade C5000	V45X50	2.033
489	294	295	-	-	Grade C5000	V45X50	2.065
490	295	296	-	-	Grade C5000	V45X50	2.065
491	296	297	-	-	Grade C5000	V45X50	2.115
492	297	187	-	-	Grade C5000	C50X55	3.6
493	297	298	-	-	Grade C5000	V45X50	2.112
494	298	299	-	-	Grade C5000	V45X50	2.063
495	299	254	-	-	Grade C5000	V45X50	2.063
497	254	258	-	-	Grade C5000	V45X50	2.063
508	291	309	-	-	Grade C5000	V30X50	0.475
509	309	310	-	-	Grade C5000	V30X50	2.925
510	310	311	-	-	Grade C5000	V30X50	4.924
511	312	313	-	-	Grade C5000	V30X50	4.924
512	310	312	-	-	Grade C5000	V30X50	2.075
513	312	266	-	-	Grade C5000	V30X50	2.125
514	309	314	-	-	Grade C5000	V15X50	1.776
515	314	265	-	-	Grade C5000	V15X50	2.424
516	253	315	-	-	Grade C5000	V20X50	0.8125
517	315	257	-	-	Grade C5000	V20X50	1.25
518	288	315	-	-	Grade C5000	V20X50	0.8
519	293	287	-	-	Grade C5000	V30X50	7.705
520	240	285	-	-	Grade C5000	V30X50	5.225
521	285	241	-	-	Grade C5000	V30X50	1.924
522	240	244	-	-	Grade C5000	V45X50	2.065
523	285	316	-	-	Grade C5000	V50X50	2.065
524	242	317	-	-	Grade C5000	V30X50	7.705
525	317	295	-	-	Grade C5000	V30X50	8.324
526	242	318	-	-	Grade C5000	V50X50	2.065
527	317	319	-	-	Grade C5000	V50X50	2.065
528	244	316	-	-	Grade C5000	V30X50	5.225
529	316	318	-	-	Grade C5000	V30X50	4.995
530	318	319	-	-	Grade C5000	V30X50	7.705
531	319	296	-	-	Grade C5000	V30X50	8.324
532	244	246	-	-	Grade C5000	V45X50	2.115
533	316	320	-	-	Grade C5000	V50X50	2.115
534	320	210	-	-	Grade C5000	C50X55	3.6
535	318	321	-	-	Grade C5000	V50X50	2.115
536	321	211	-	-	Grade C5000	C50X55	3.6
537	319	322	-	-	Grade C5000	V50X50	2.115
538	322	212	-	-	Grade C5000	C50X55	3.6
539	246	320	-	-	Grade C5000	V40X50	5.225
540	320	321	-	-	Grade C5000	V40X50	4.995
541	321	322	-	-	Grade C5000	V40X50	7.705
542	322	297	-	-	Grade C5000	V40X50	8.324
543	246	248	-	-	Grade C5000	V45X50	2.112
544	320	323	-	-	Grade C5000	V50X50	2.112
545	321	324	-	-	Grade C5000	V50X50	2.112
546	322	325	-	-	Grade C5000	V50X50	2.112
547	248	323	-	-	Grade C5000	V30X50	5.225
548	323	324	-	-	Grade C5000	V30X50	4.995
549	324	325	-	-	Grade C5000	V30X50	7.705
550	325	298	-	-	Grade C5000	V30X50	8.324
551	248	250	-	-	Grade C5000	V45X50	2.063
552	323	326	-	-	Grade C5000	V50X50	2.063
553	324	327	-	-	Grade C5000	V50X50	2.063
554	325	328	-	-	Grade C5000	V50X50	2.063
555	250	326	-	-	Grade C5000	V30X50	5.225
556	326	327	-	-	Grade C5000	V30X50	4.995
557	327	328	-	-	Grade C5000	V30X50	7.705
558	328	299	-	-	Grade C5000	V30X50	8.324
559	250	252	-	-	Grade C5000	V45X50	2.063
560	326	329	-	-	Grade C5000	V50X50	2.063
561	327	330	-	-	Grade C5000	V50X50	2.063
562	328	331	-	-	Grade C5000	V50X50	2.063
563	252	329	-	-	Grade C5000	V30X50	5.225

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564	329	330	-	-	Grade C5000	V30X50	4.995
565	330	331	-	-	Grade C5000	V30X50	7.705
566	331	253	-	-	Grade C5000	V30X50	0.8
567	252	256	-	-	Grade C5000	V45X50	2.063
568	329	332	-	-	Grade C5000	V50X50	2.063
569	330	333	-	-	Grade C5000	V50X50	2.063
570	331	288	-	-	Grade C5000	V50X50	0.8125
571	256	332	-	-	Grade C5000	V30X50	5.225
572	332	333	-	-	Grade C5000	V30X50	4.995
573	333	289	-	-	Grade C5000	V40X50	7.705
574	289	257	-	-	Grade C5000	V40X50	0.8
575	256	260	-	-	Grade C5000	V45X50	1.348
576	332	334	-	-	Grade C5000	V50X50	1.348
577	334	224	-	-	Grade C5000	C50X50	3.6
578	333	335	-	-	Grade C5000	V50X50	1.348
579	335	225	-	-	Grade C5000	C50X50	3.6
580	289	290	-	-	Grade C5000	V50X50	1.348
583	258	311	-	-	Grade C5000	V45X50	1.995
585	260	334	-	-	Grade C5000	V50X50	5.225
586	334	335	-	-	Grade C5000	V50X50	4.995
587	335	290	-	-	Grade C5000	V40X50	7.705
588	260	262	-	-	Grade C5000	V45X50	2.424
589	334	337	-	-	Grade C5000	V50X50	2.424
590	335	338	-	-	Grade C5000	V50X50	2.424
591	262	337	-	-	Grade C5000	V30X50	5.225
592	337	338	-	-	Grade C5000	V30X50	4.995
593	338	292	-	-	Grade C5000	V30X50	7.705
594	292	314	-	-	Grade C5000	V30X50	0.475
595	262	264	-	-	Grade C5000	V45X50	2.424
596	337	339	-	-	Grade C5000	V50X50	2.424
597	339	229	-	-	Grade C5000	C50X55	3.6
598	338	340	-	-	Grade C5000	V50X50	2.424
599	340	230	-	-	Grade C5000	C50X55	3.6
600	292	341	-	-	Grade C5000	V50X50	2.424
601	341	231	-	-	Grade C5000	C50X55	3.6
602	264	339	-	-	Grade C5000	V40X50	5.225
603	339	340	-	-	Grade C5000	V40X50	4.995
604	340	341	-	-	Grade C5000	V40X50	7.705
605	341	265	-	-	Grade C5000	V40X50	0.475
606	264	269	-	-	Grade C5000	V45X50	1.35
607	339	270	-	-	Grade C5000	V50X50	1.35
608	340	271	-	-	Grade C5000	V50X50	1.35
609	341	272	-	-	Grade C5000	V50X50	1.35
612	267	273	-	-	Grade C5000	V45X50	1.35
614	287	317	-	-	Grade C5000	V50X50	2.065
615	287	294	-	-	Grade C5000	V30X50	8.324
619	311	313	-	-	Grade C5000	V45X50	2.075
621	313	267	-	-	Grade C5000	V45X50	2.125
623	385	599	-	-	Grade C5000	V30X50	1.924
629	417	457	-	-	Grade C5000	V30X50	2.4
631	389	449	-	-	Grade C5000	V40X50	2.4
643	379	596	-	-	Grade C5000	V40X50	1.924
645	381	382	-	-	Grade C5000	V40X50	7.706
646	382	447	-	-	Grade C5000	V40X50	2.4
659	379	377	-	-	Grade C5000	V50X50	2.18
660	377	600	-	-	Grade C5000	V50X50	0.5739
665	382	387	-	-	Grade C5000	V50X50	2.091
666	417	389	-	-	Grade C5000	V50X50	2.063
667	390	463	-	-	Grade C5000	V50X50	1.04
668	381	392	-	-	Grade C5000	V50X50	2.145
669	392	345	-	-	Grade C5000	V50X50	2.065
683	392	387	-	-	Grade C5000	V30X50	7.705
687	385	402	-	-	Grade C5000	V50X50	2.065
688	345	403	-	-	Grade C5000	V30X50	7.705
689	403	452	-	-	Grade C5000	V30X50	2.4
690	345	404	-	-	Grade C5000	V50X50	2.065
691	403	405	-	-	Grade C5000	V50X50	2.065
693	402	404	-	-	Grade C5000	V30X50	4.995
694	404	405	-	-	Grade C5000	V30X50	7.705
695	405	453	-	-	Grade C5000	V30X50	2.4
697	402	406	-	-	Grade C5000	V50X50	2.115

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698	404	407	-	-	Grade C5000	V50X50	2.115
699	405	408	-	-	Grade C5000	V50X50	2.115
701	406	407	-	-	Grade C5000	V40X50	4.995
702	407	408	-	-	Grade C5000	V40X50	7.705
703	408	454	-	-	Grade C5000	V40X50	2.4
705	406	409	-	-	Grade C5000	V50X50	2.112
706	407	410	-	-	Grade C5000	V50X50	2.112
707	408	411	-	-	Grade C5000	V50X50	2.112
709	409	410	-	-	Grade C5000	V30X50	4.995
710	410	411	-	-	Grade C5000	V30X50	7.705
711	411	455	-	-	Grade C5000	V30X50	2.4
713	409	412	-	-	Grade C5000	V50X50	2.063
714	410	413	-	-	Grade C5000	V50X50	2.063
715	411	414	-	-	Grade C5000	V50X50	2.063
717	412	413	-	-	Grade C5000	V30X50	4.995
718	413	414	-	-	Grade C5000	V30X50	7.705
719	414	456	-	-	Grade C5000	V30X50	2.4
721	412	415	-	-	Grade C5000	V50X50	2.063
722	413	416	-	-	Grade C5000	V50X50	2.063
723	414	417	-	-	Grade C5000	V50X50	2.063
725	415	416	-	-	Grade C5000	V30X50	4.995
726	416	417	-	-	Grade C5000	V30X50	7.705
729	415	418	-	-	Grade C5000	V50X50	2.063
730	416	419	-	-	Grade C5000	V50X50	2.063
733	418	419	-	-	Grade C5000	V30X50	4.995
734	419	389	-	-	Grade C5000	V40X50	7.705
737	418	420	-	-	Grade C5000	V50X50	1.348
738	419	421	-	-	Grade C5000	V50X50	1.348
739	389	390	-	-	Grade C5000	V50X50	1.348
742	420	421	-	-	Grade C5000	V40X50	4.995
743	421	390	-	-	Grade C5000	V40X50	7.705
745	420	461	-	-	Grade C5000	V50X50	1.04
746	421	462	-	-	Grade C5000	V50X50	1.04
762	387	403	-	-	Grade C5000	V50X50	2.065
763	387	446	-	-	Grade C5000	V30X50	2.4
775	169	379	-	-	Grade C5000	C50X55	3.6
776	171	381	-	-	Grade C5000	C50X55	3.6
777	172	382	-	-	Grade C5000	C50X55	3.6
779	179	389	-	-	Grade C5000	C50X55	3.6
781	210	406	-	-	Grade C5000	C50X55	3.6
782	211	407	-	-	Grade C5000	C50X55	3.6
783	212	408	-	-	Grade C5000	C50X55	3.6
784	224	420	-	-	Grade C5000	C50X50	3.6
785	225	421	-	-	Grade C5000	C50X50	3.6
789	444	430	-	-	Grade C5000	V50X50	2.197
790	430	377	-	-	Grade C5000	V30X50	2.4
791	430	432	-	-	Grade C5000	V50X50	2.065
793	432	385	-	-	Grade C5000	V30X50	2.4
794	432	433	-	-	Grade C5000	V50X50	2.065
795	433	402	-	-	Grade C5000	V30X50	2.4
796	433	434	-	-	Grade C5000	V50X50	2.115
797	434	406	-	-	Grade C5000	V40X50	2.4
798	434	435	-	-	Grade C5000	V50X50	2.112
799	435	409	-	-	Grade C5000	V30X50	2.4
800	435	436	-	-	Grade C5000	V50X50	2.063
801	436	412	-	-	Grade C5000	V30X50	2.4
802	436	437	-	-	Grade C5000	V50X50	2.063
803	437	415	-	-	Grade C5000	V30X50	2.4
804	437	438	-	-	Grade C5000	V50X50	2.063
805	438	418	-	-	Grade C5000	V30X50	2.4
806	438	439	-	-	Grade C5000	V50X50	1.348
807	439	420	-	-	Grade C5000	V40X50	2.4
808	439	464	-	-	Grade C5000	V50X50	1.04
816	444	379	-	-	Grade C5000	V40X50	2.4
818	447	446	-	-	Grade C5000	V50X50	2.075
821	457	449	-	-	Grade C5000	V50X50	2.063
823	449	466	-	-	Grade C5000	V50X50	1.348
825	452	453	-	-	Grade C5000	V50X50	2.065
828	453	454	-	-	Grade C5000	V50X50	2.115
830	454	455	-	-	Grade C5000	V50X50	2.112
832	455	456	-	-	Grade C5000	V50X50	2.063

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834	456	457	-	-	Grade C5000	V50X50	2.063
843	446	452	-	-	Grade C5000	V50X50	2.065
844	461	462	-	-	Grade C5000	V30X50	4.995
847	462	463	-	-	Grade C5000	V30X50	7.705
849	464	461	-	-	Grade C5000	V30X50	2.4
850	390	466	-	-	Grade C5000	V40X50	2.4
852	466	468	-	-	Grade C5000	V50X50	1.04
853	463	468	-	-	Grade C5000	V30X50	2.4
856	470	471	-	-	Grade C5000	V45X50	2.065
857	471	472	-	-	Grade C5000	V45X50	2.065
858	472	473	-	-	Grade C5000	V45X50	2.115
859	473	474	-	-	Grade C5000	V45X50	2.112
860	474	475	-	-	Grade C5000	V45X50	2.063
861	475	476	-	-	Grade C5000	V45X50	2.063
862	476	477	-	-	Grade C5000	V45X50	2.063
863	477	478	-	-	Grade C5000	V45X50	1.886
864	479	480	-	-	Grade C5000	V45X50	1.35
865	481	479	-	-	Grade C5000	V45X50	2.424
866	478	481	-	-	Grade C5000	V45X50	1.886
867	173	484	-	-	Grade C5000	V40X50	1.37
869	484	470	-	-	Grade C5000	V45X50	2.023
870	184	470	-	-	Grade C5000	V30X50	1.37
871	185	471	-	-	Grade C5000	V30X50	1.37
872	186	472	-	-	Grade C5000	V30X50	1.37
873	188	474	-	-	Grade C5000	V30X50	1.37
874	189	475	-	-	Grade C5000	V30X50	1.37
875	144	476	-	-	Grade C5000	V30X50	1.37
876	237	478	-	-	Grade C5000	V30X50	1.37
877	235	481	-	-	Grade C5000	V30X50	1.37
878	163	480	-	-	Grade C5000	V30X50	1.37
879	187	473	-	-	Grade C5000	V40X50	1.37
880	148	477	-	-	Grade C5000	V40X50	1.37
881	157	479	-	-	Grade C5000	V40X50	1.37
882	485	486	-	-	Grade C5000	V42X50	1.375
883	487	488	-	-	Grade C5000	V30X50	3.071
884	489	490	-	-	Grade C5000	V30X50	1.375
885	491	492	-	-	Grade C5000	V40X50	1.375
889	499	595	-	-	Grade C5000	V30X50	2.6
891	503	591	-	-	Grade C5000	V40X50	2.6
892	504	87	-	-	Grade C5000	C50X55	3.6
896	511	512	-	-	Grade C5000	V30X50	2.925
897	512	513	-	-	Grade C5000	V40X50	4.924
898	513	100	-	-	Grade C5000	C50X55	3.6
906	522	523	-	-	Grade C5000	V30X50	5.225
907	524	525	-	-	Grade C5000	V40X50	5.225
908	524	25	-	-	Grade C5000	C50X55	3.6
909	525	526	-	-	Grade C5000	V40X50	1.924
910	525	28	-	-	Grade C5000	C50X55	3.6
911	526	527	-	-	Grade C5000	V30X50	3.071
912	527	528	-	-	Grade C5000	V40X50	7.706
913	527	36	-	-	Grade C5000	C50X55	3.6
914	528	529	-	-	Grade C5000	V40X50	8.324
915	528	34	-	-	Grade C5000	C50X55	3.6
916	529	26	-	-	Grade C5000	C50X55	3.6
917	524	522	-	-	Grade C5000	V45X50	2.217
918	522	486	-	-	Grade C5000	V45X50	2.065
919	485	489	-	-	Grade C5000	V30X50	2.065
920	489	491	-	-	Grade C5000	V30X50	2.115
929	525	523	-	-	Grade C5000	V50X50	2.18
930	523	530	-	-	Grade C5000	V50X50	0.5739
931	530	531	-	-	Grade C5000	V50X50	1.491
932	526	532	-	-	Grade C5000	V25X50	2.741
933	532	487	-	-	Grade C5000	V25X50	1.491
934	530	532	-	-	Grade C5000	V25X50	1.924
935	528	533	-	-	Grade C5000	V50X50	2.091
936	534	535	-	-	Grade C5000	V50X50	1.25
937	535	86	-	-	Grade C5000	C50X55	3.6
938	535	537	-	-	Grade C5000	V50X50	1.995
939	537	538	-	-	Grade C5000	V50X50	1.776
940	527	539	-	-	Grade C5000	V50X50	2.145
941	539	488	-	-	Grade C5000	V50X50	2.065

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942	529	540	-	-	Grade C5000	V45X50	2.033
943	540	541	-	-	Grade C5000	V45X50	2.065
944	541	542	-	-	Grade C5000	V45X50	2.065
945	542	543	-	-	Grade C5000	V45X50	2.115
946	543	6	-	-	Grade C5000	C50X55	3.6
947	543	544	-	-	Grade C5000	V45X50	2.112
948	544	545	-	-	Grade C5000	V45X50	2.063
949	545	546	-	-	Grade C5000	V45X50	0.825
950	546	500	-	-	Grade C5000	V45X50	1.238
951	500	547	-	-	Grade C5000	V45X50	0.4602
952	547	504	-	-	Grade C5000	V45X50	1.602
953	546	548	-	-	Grade C5000	V40X50	4.625
954	548	103	-	-	Grade C5000	C40X40	3.6
955	547	549	-	-	Grade C5000	V30X50	4.625
956	550	548	-	-	Grade C5000	V40X50	0.7
957	549	551	-	-	Grade C5000	V40X50	1.602
958	551	88	-	-	Grade C5000	C40X40	3.6
959	552	553	-	-	Grade C5000	V40X50	2.075
960	553	554	-	-	Grade C5000	V40X50	2.125
961	554	101	-	-	Grade C5000	C40X40	3.6
962	537	555	-	-	Grade C5000	V30X50	0.475
963	555	556	-	-	Grade C5000	V30X50	2.925
964	556	557	-	-	Grade C5000	V30X50	4.924
965	558	559	-	-	Grade C5000	V30X50	4.924
966	556	558	-	-	Grade C5000	V35X50	2.075
967	558	512	-	-	Grade C5000	V35X50	2.125
968	555	560	-	-	Grade C5000	V15X50	1.776
969	560	511	-	-	Grade C5000	V15X50	2.424
970	499	561	-	-	Grade C5000	V20X50	0.8125
971	561	503	-	-	Grade C5000	V20X50	1.25
972	534	561	-	-	Grade C5000	V20X50	0.8
973	539	533	-	-	Grade C5000	V30X50	7.705
974	486	531	-	-	Grade C5000	V30X50	5.225
975	531	487	-	-	Grade C5000	V30X50	1.924
976	486	490	-	-	Grade C5000	V45X50	2.065
977	531	562	-	-	Grade C5000	V50X50	2.065
978	488	563	-	-	Grade C5000	V30X50	7.705
979	563	541	-	-	Grade C5000	V30X50	8.324
980	488	564	-	-	Grade C5000	V50X50	2.065
981	563	565	-	-	Grade C5000	V50X50	2.065
982	490	562	-	-	Grade C5000	V30X50	5.225
983	562	564	-	-	Grade C5000	V30X50	4.995
984	564	565	-	-	Grade C5000	V30X50	7.705
985	565	542	-	-	Grade C5000	V30X50	8.324
986	490	492	-	-	Grade C5000	V45X50	2.115
987	492	67	-	-	Grade C5000	C50X55	3.6
988	562	566	-	-	Grade C5000	V50X50	2.115
989	566	68	-	-	Grade C5000	C50X55	3.6
990	564	567	-	-	Grade C5000	V50X50	2.115
991	567	69	-	-	Grade C5000	C50X55	3.6
992	565	568	-	-	Grade C5000	V50X50	2.115
993	568	70	-	-	Grade C5000	C50X55	3.6
994	492	566	-	-	Grade C5000	V40X50	5.225
995	566	567	-	-	Grade C5000	V40X50	4.995
996	567	568	-	-	Grade C5000	V40X50	7.705
997	568	592	-	-	Grade C5000	V40X50	3.4
1001	568	571	-	-	Grade C5000	V50X50	2.112
1005	571	593	-	-	Grade C5000	V30X50	3.4
1009	571	574	-	-	Grade C5000	V50X50	2.063
1013	574	594	-	-	Grade C5000	V30X50	3.4
1017	574	577	-	-	Grade C5000	V50X50	2.063
1021	577	499	-	-	Grade C5000	V30X50	0.8
1025	577	534	-	-	Grade C5000	V50X50	0.8125
1029	535	503	-	-	Grade C5000	V40X50	0.8
1036	504	551	-	-	Grade C5000	V40X50	4.625
1038	504	557	-	-	Grade C5000	V45X50	1.995
1039	551	552	-	-	Grade C5000	V40X50	1.995
1049	538	560	-	-	Grade C5000	V30X50	0.475
1051	510	96	-	-	Grade C5000	C50X55	3.6
1053	585	97	-	-	Grade C5000	C50X55	3.6
1055	586	98	-	-	Grade C5000	C50X55	3.6

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1056	538	587	-	-	Grade C5000	V50X50	2.424
1057	587	99	-	-	Grade C5000	C50X55	3.6
1058	510	585	-	-	Grade C5000	V40X50	5.225
1059	585	586	-	-	Grade C5000	V40X50	4.995
1060	586	587	-	-	Grade C5000	V40X50	7.705
1061	587	511	-	-	Grade C5000	V40X50	0.475
1066	513	554	-	-	Grade C5000	V40X50	4.625
1070	533	563	-	-	Grade C5000	V50X50	2.065
1071	533	540	-	-	Grade C5000	V30X50	8.324
1072	548	589	-	-	Grade C5000	V40X50	0.8
1073	548	549	-	-	Grade C5000	V40X50	1.698
1074	557	552	-	-	Grade C5000	V30X50	4.625
1075	557	559	-	-	Grade C5000	V45X50	2.075
1076	559	553	-	-	Grade C5000	V30X50	4.625
1077	559	513	-	-	Grade C5000	V45X50	2.125
1078	595	591	-	-	Grade C5000	V35X50	2.063
1079	591	504	-	-	Grade C5000	V40X50	4.924
1080	591	556	-	-	Grade C5000	V35X50	1.995
1081	592	593	-	-	Grade C5000	V35X50	2.112
1082	592	543	-	-	Grade C5000	V40X50	4.924
1083	593	544	-	-	Grade C5000	V30X50	4.924
1084	593	594	-	-	Grade C5000	V35X50	2.063
1085	594	545	-	-	Grade C5000	V30X50	4.924
1086	594	595	-	-	Grade C5000	V35X50	2.063
1087	595	500	-	-	Grade C5000	V30X50	4.924
1088	596	598	-	-	Grade C5000	V25X50	2.167
1089	598	597	-	-	Grade C5000	V25X50	0.5739
1090	596	381	-	-	Grade C5000	V40X50	3.071
1091	598	392	-	-	Grade C5000	V30X50	3.071
1092	597	599	-	-	Grade C5000	V25X50	1.491
1093	599	345	-	-	Grade C5000	V30X50	3.071
1094	600	597	-	-	Grade C5000	V25X50	1.924
1095	600	385	-	-	Grade C5000	V50X50	1.491

14.13 TOTAL WEIGHT / VOLUME / SURFACE AREA SUMMARY

SECTION NO	SECION NAME	SURFACE AREA	VOLUME	WEIGHT	FRAME NUMBER	TRUSS NUMBER
1	C70	31.67	5.542	13.32	2	0
2	C50X55	567	74.25	178.4	75	0
3	C50X50	57.6	7.2	17.3	8	0
4	C40X40	34.56	3.456	8.304	6	0
5	V15X50	16.38	0.945	2.271	6	0
6	V20X50	12.02	0.8588	2.063	9	0
7	V25X50	46.17	3.847	9.244	16	0
8	V30X50	1719	161.2	387.3	250	0
9	V35X50	24.64	2.537	6.095	7	0
10	V40X50	907	100.8	242.1	115	0
11	V42X50	10.12	1.155	2.775	4	0
12	V45X50	381.2	45.14	108.5	103	0
13	V50X50	775.7	96.96	233	197	0

14.14 LOAD DATA

```
; Self Weight, Nodal Load, Specified Displacement, Beam Load, Floor Load, Finishing Material Load,

    System Temperature, Nodal Temperature, Element Temperature, Beam Section Temperature,

    Wind Load, Static Seismic Load, Time History Analysis Data
```

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14.15 FLOOR LOAD TYPE DATA

NAME	LOADCASE NAME	LOAD	SUB-BEAM WEIGHT
Mezanine	SCP	-0.7	Consider
	CV	-0.2	Do not consider
Entrepiso	SCP	-0.7	Consider
	CV	-0.2	Do not consider
Escaleras	SCP	-0.7	Consider
	CV	-0.3	Do not consider
Terraza	SCP	-0.5	Consider
	CV	-0.2	Do not consider
Cubierta	SCP	-0.5	Consider
	CV	-0.2	Do not consider
Ascensor	SCP	-1	Consider
	CV	-0.35	Do not consider

14.16 FLOOR LOAD DATA

LOAD TYPE	DISTRIBUTION	DIR.	PROJ	SUB-BEAM NUMBER	SUB-BEAM ANGLE	SUB-BEAM UNIT-W	NODE LIST
Entrepiso	One Way	GZ	NO	0	0	0	161 171 172 173 484 480
Escaleras	Two Way	GZ	NO	0	0	0	309 310 266 265
Escaleras	Two Way	GZ	NO	0	0	0	51 49 47 50 52 18
Escaleras	Two Way	GZ	NO	0	0	0	526 527 488 487
Escaleras	Two Way	GZ	NO	0	0	0	170 171 132 131
Entrepiso	One Way	GZ	NO	0	0	0	268 239 240 278 279 284 286 241 242 271
Entrepiso	One Way	GZ	NO	0	0	0	21 1 59 23 25 28 24 32 33 31 61 37
Mezanine	One Way	GZ	NO	0	0	0	491 485 486 524 525 523 530 532 487 488 564 567 566 492
Cubierta	One Way	GZ	NO	0	0	0	444 464 462 381 596 597 600 379
Entrepiso	One Way	GZ	NO	0	0	0	271 281 282 291 309 265 341 272
Entrepiso	One Way	GZ	NO	0	0	0	37 36 34 45 51 52 99 35
Mezanine	One Way	GZ	NO	0	0	0	567 527 528 529 543 568
Cubierta	One Way	GZ	NO	0	0	0	381 462 468 447
Entrepiso	One Way	GZ	NO	0	0	0	291 282 283 311
Entrepiso	One Way	GZ	NO	0	0	0	45 34 26 39 103 46
Mezanine	One Way	GZ	NO	0	0	0	587 568 543 546 548 554 513 512 556 555 511
Ascensor	Two Way	GZ	NO	0	0	0	379 596 597 600
Entrepiso	One Way	GZ	NO	0	0	0	311 273 272 341 266 310
Entrepiso	One Way	GZ	NO	0	0	0	46 44 35 99 50 49
Escaleras	Two Way	GZ	NO	0	0	0	512 511 555 556
Entrepiso	One Way	GZ	NO	0	0	0	158 129 130 168 169 174 176 131 132 161
Escaleras	Two Way	GZ	NO	0	0	0	280 281 242 241
Escaleras	Two Way	GZ	NO	0	0	0	30 36 57 61 31 33

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14.17 BEAM LOAD DATA

MEMBER	TYPE	DIR.	PROJ.	D1	P1	D2	P2	D3	P3	D4	P4
277	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
278	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
279	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
280	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
281	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
282	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
283	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
284	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
285	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
286	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
287	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
288	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
289	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
290	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
291	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
292	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0
293	Uniform Load	GZ	NO	0	-0.828	1	-0.828	0	0	0	0

14.18 [LOAD CASE : VX]

WIND LOADS BASED ON NSR-10 [UNIT: tonf, m]

Design Wind Loads	: F	= p * Area
Design Wind Pressure	: p	= qz*G*Cp1 - qh*G*Cp2
Velocity Pressure at Design Height z [N/m^2]	: qz	= 0.613*Kz*Kzt*Kd*V^2*I
Velocity Pressure at Mean Roof Height [N/m^2]	: qh	= 0.613*Kh*Kht*Kd*V^2*I
Calculated Value of qh for X-dir [N/m^2]	: qh	= 577.94
Calculated Value of qh for Y-dir [N/m^2]	: qh	= 577.94
Basic Wind Speed [km/h]	: V	= 130.00
Directional Factor for X-dir Wind Loads	: Kdx	= 0.85
Directional Factor for Y-dir Wind Loads	: Kdy	= 0.85
Importance Factor	: I	= 1.00
Exposure Category	: B	
Mean Roof Height	: H	= 18.00
Gradient Height [m]	: Zg	= 365.76
Force Coefficient	: Alpha	= 7.00
Kz at Mean Roof Height (Kh)	: Kh	= 0.85
Structural Rigidity	: Rigid Structure	
Gust effect Factor for X-dir Wind Loads	: Gx	= 0.85
Gust effect Factor for Y-dir Wind Loads	: Gy	= 0.85
Topographic Effects for X-dir Wind Loads	: Not Included	
Topographic Effects for Y-dir Wind Loads	: Not Included	

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Accidental Eccentricity for X-direction : Wx = None
Accidental Eccentricity for Y-direction : Wy = None
Scale Factor for X-directional Wind Loads : SFx = 1.00
Scale Factor for Y-directional Wind Loads : SFy = 0.00

Wind force of the specific story is calculated as the sum of the forces

of the following two parts.

1. Part I : Lower half part of the specific story

2. Part II : Upper half part of the just below story of the specific story

The reference height for the calculation of the wind pressure related factors are,

therefore, considered separately for the above mentioned two parts as follows.

Reference height for the wind pressure related factors(except topographic related factors)

1. Part I : top level of the specific story

2. Part II : top level of the just below story of the specific story

Reference height for the topographic related factors :

1. Part I : bottom level of the specific story

2. Part II : bottom level of the just below story of the specific story

---

** External Pressure Coefficients at Windward and Leeward Walls (Cp1, Cp2)

STORY NAME	Cp1 (Windward)	Cp2(X-DIR) (Leeward)	Cp2(Y-DIR) (Leeward)
Roof	0.800	-0.481	-0.500
5F	0.800	-0.481	-0.500
4F	0.800	-0.500	-0.473
3F	0.800	-0.500	-0.473
2F	0.800	-0.500	-0.412
1F	0.800	-0.500	-0.431

** Velocity Exposure Coefficients at Design Height (Kz)

** Topographic Factors at Windward and Leeward Walls (Kzt)

** Velocity Pressure at Design Height (qz) [Current Unit]

STORY NAME	Kz	Kzt(X-DIR) (Windward)	Kzt(Y-DIR) (Windward)	Kzt(X-DIR) (Leeward)	Kzt(Y-DIR) (Leeward)	qz(X-DIR)	qz(Y-DIR)
Roof	0.850	1.000	1.000	1.000	1.000	0.059	0.059
5F	0.850	1.000	1.000	1.000	1.000	0.059	0.059
4F	0.798	1.000	1.000	1.000	1.000	0.055	0.055
3F	0.735	1.000	1.000	1.000	1.000	0.051	0.051
2F	0.654	1.000	1.000	1.000	1.000	0.045	0.045
1F	0.575	1.000	1.000	1.000	1.000	0.040	0.040

W I N D L O A D G E N E R A T I O N D A T A X - D I R E C T I O N

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STORY NAME	PRESSURE	ELEV.	LOADED HEIGHT	LOADED BREADTH	WIND FORCE	ADDED FORCE	STORY FORCE	STORY SHEAR	OVERTURN`G MOMENT
Roof	0.064193	18.0	1.8	17.5	2.0220837	0.0	2.0220837	0.0	0.0
5F	0.064193	14.4	3.6	17.5	5.1372873	0.0	5.1372873	2.0220837	7.2795012
4F	0.062651	10.8	3.6	27.624	6.0828733	0.0	6.0828733	7.159371	33.053237
3F	0.059684	7.2	3.6	27.624	6.2927685	0.0	6.2927685	13.242244	80.725316
2F	0.055895	3.6	3.6	33.049	6.2227689	0.0	6.2227689	19.535013	151.05136
G.L.	0.052141	0.0	1.8	30.874	0.0	0.0	--	25.757782	243.77938

W I N D L O A D G E N E R A T I O N D A T A Y - D I R E C T I O N

STORY NAME	PRESSURE	ELEV.	LOADED HEIGHT	LOADED BREADTH	WIND FORCE	ADDED FORCE	STORY FORCE	STORY SHEAR	OVERTURN`G MOMENT
Roof	0.065126	18.0	1.8	19.1299	2.2425488	0.0	0.0	0.0	0.0
5F	0.065126	14.4	3.6	19.1299	4.9239244	0.0	0.0	0.0	0.0
4F	0.061284	10.8	3.6	24.3074	5.2329302	0.0	0.0	0.0	0.0
3F	0.058317	7.2	3.6	24.3074	4.6793287	0.0	0.0	0.0	0.0
2F	0.051491	3.6	3.6	22.9574	4.145393	0.0	0.0	0.0	0.0
G.L.	0.048825	0.0	1.8	22.9574	0.0	0.0	--	0.0	0.0

W I N D L O A D G E N E R A T I O N D A T A RZ - D I R E C T I O N

STORY NAME	TORSIONAL PRESSURE	ELEV.	LOADED HEIGHT	LOADED BREADTH	WIND TORSION	ADDED TORSION	STORY TORSION	ACCUMULATED TORSION
Roof	0.0	18.0	1.8	17.5	0.0	0.0	0.0	0.0
5F	0.0	14.4	3.6	17.5	0.0	0.0	0.0	0.0
4F	0.0	10.8	3.6	27.624	0.0	0.0	0.0	0.0
3F	0.0	7.2	3.6	27.624	0.0	0.0	0.0	0.0
2F	0.0	3.6	3.6	33.049	0.0	0.0	0.0	0.0
G.L.	0.0	0.0	1.8	30.874	0.0	0.0	--	0.0

ECCENTRICITY RELATED DATA

STORY NAME	STORY FORCE(X)	STORY FORCE(Y)	ACCIDENTAL ECCENT.(X)	ACCIDENTAL ECCENT.(Y)	ACCIDENTAL TORSION(X)	ACCIDENTAL TORSION(Y)
Roof	2.0220837	0.0	0.0	0.0	0.0	0.0
5F	5.1372873	0.0	0.0	0.0	0.0	0.0
4F	6.0828733	0.0	0.0	0.0	0.0	0.0
3F	6.2927685	0.0	0.0	0.0	0.0	0.0
2F	6.2227689	0.0	0.0	0.0	0.0	0.0
G.L.	--	--	0.0	0.0	--	--

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14.19 [LOAD CASE : VY]

```
** WIND LOAD DATA : CODE , NSR-10
   ------------------------------------------------------------------------------------------------------------
   ----
   WIND LOADS BASED ON NSR-10 [UNIT: tonf, m]

 ____________________________________________________________________
   Design Wind Loads                                 : F    = p * Area
   Design Wind Pressure                              : p    = qz*G*Cp1 - qh*G*Cp2
   Velocity Pressure at Design Height z [N/m^2]        : qz   = 0.613*Kz*Kzt*Kd*V^2*I
   Velocity Pressure at Mean Roof Height [N/m^2]       : qh   = 0.613*Kh*Kht*Kd*V^2*I
   Calculated Value of qh for X-dir [N/m^2]            : qh   = 577.94
   Calculated Value of qh for Y-dir [N/m^2]            : qh   = 577.94
   Basic Wind Speed [km/h]                           : V    = 130.00
   Directional Factor for X-dir Wind Loads           : Kdx  = 0.85
   Directional Factor for Y-dir Wind Loads           : Kdy  = 0.85
   Importance Factor                                 : I    = 1.00
   Exposure Category                                 : B
   Mean Roof Height                                  : H    = 18.00
   Gradient Height [m]                               : Zg   = 365.76
   Force Coefficient                                 : Alpha= 7.00
   Kz at Mean Roof Height (Kh)                       : Kh   = 0.85
   Structural Rigidity                               : Rigid Structure
   Gust effect Factor for X-dir Wind Loads           : Gx   = 0.85
   Gust effect Factor for Y-dir Wind Loads           : Gy   = 0.85
   Topographic Effects for X-dir Wind Loads          : Not Included
   Topographic Effects for Y-dir Wind Loads          : Not Included
   Accidental Eccentricity for X-direction           : Wx   = None
   Accidental Eccentricity for Y-direction           : Wy   = None
   Scale Factor for X-directional Wind Loads         : SFx  = 0.00
   Scale Factor for Y-directional Wind Loads         : SFy  = 1.00

------------------------------------------------------------------------------------------------------------
 Wind force of the specific story is calculated as the sum of the forces

 of the following two parts.

 1. Part I  : Lower half part of the specific story

 2. Part II : Upper half part of the just below story of the specific story


 The reference height for the calculation of the wind pressure related factors are,

 therefore, considered separately for the above mentioned two parts as follows.

 Reference height for the wind pressure related factors(except topographic related factors)

 1. Part I  : top level of the specific story

 2. Part II : top level of the just below story of the specific story


 Reference height for the topographic related factors :

 1. Part I  : bottom level of the specific story

 2. Part II : bottom level of the just below story of the specific story

------------------------------------------------------------------------------------------------------------

   ** External Pressure Coefficients at Windward and Leeward Walls (Cp1, Cp2)

        STORY         Cp1  Cp2(X-DIR)  Cp2(Y-DIR)

         NAME  (Windward)   (Leeward)   (Leeward)

   ---------- ----------- ----------- -----------
```

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Roof	0.800	-0.481	-0.500
5F	0.800	-0.481	-0.500
4F	0.800	-0.500	-0.473
3F	0.800	-0.500	-0.473
2F	0.800	-0.500	-0.412
1F	0.800	-0.500	-0.431

** Velocity Exposure Coefficients at Design Height (Kz)

** Topographic Factors at Windward and Leeward Walls (Kzt)

** Velocity Pressure at Design Height (qz) [Current Unit]

STORY NAME	Kz	Kzt(X-DIR) (Windward)	Kzt(Y-DIR) (Windward)	Kzt(X-DIR) (Leeward)	Kzt(Y-DIR) (Leeward)	qz(X-DIR)	qz(Y-DIR)
Roof	0.850	1.000	1.000	1.000	1.000	0.059	0.059
5F	0.850	1.000	1.000	1.000	1.000	0.059	0.059
4F	0.798	1.000	1.000	1.000	1.000	0.055	0.055
3F	0.735	1.000	1.000	1.000	1.000	0.051	0.051
2F	0.654	1.000	1.000	1.000	1.000	0.045	0.045
1F	0.575	1.000	1.000	1.000	1.000	0.040	0.040

W I N D L O A D G E N E R A T I O N D A T A X - D I R E C T I O N

STORY NAME	PRESSURE	ELEV.	LOADED HEIGHT	LOADED BREADTH	WIND FORCE	ADDED FORCE	STORY FORCE	STORY SHEAR	OVERTURN`G MOMENT
Roof	0.064193	18.0	1.8	17.5	2.0220837	0.0	0.0	0.0	0.0
5F	0.064193	14.4	3.6	17.5	5.1372873	0.0	0.0	0.0	0.0
4F	0.062651	10.8	3.6	27.624	6.0828733	0.0	0.0	0.0	0.0
3F	0.059684	7.2	3.6	27.624	6.2927685	0.0	0.0	0.0	0.0
2F	0.055895	3.6	3.6	33.049	6.2227689	0.0	0.0	0.0	0.0
G.L.	0.052141	0.0	1.8	30.874	0.0	0.0	--	0.0	0.0

W I N D L O A D G E N E R A T I O N D A T A Y - D I R E C T I O N

STORY NAME	PRESSURE	ELEV.	LOADED HEIGHT	LOADED BREADTH	WIND FORCE	ADDED FORCE	STORY FORCE	STORY SHEAR	OVERTURN`G MOMENT
Roof	0.065126	18.0	1.8	19.1299	2.2425488	0.0	2.2425488	0.0	0.0
5F	0.065126	14.4	3.6	19.1299	4.9239244	0.0	4.9239244	2.2425488	8.0731757
4F	0.061284	10.8	3.6	24.3074	5.2329302	0.0	5.2329302	7.1664732	33.872479
3F	0.058317	7.2	3.6	24.3074	4.6793287	0.0	4.6793287	12.399403	78.510332
2F	0.051491	3.6	3.6	22.9574	4.145393	0.0	4.145393	17.078732	139.99377
G.L.	0.048825	0.0	1.8	22.9574	0.0	0.0	--	21.224125	216.40062

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W I N D L O A D G E N E R A T I O N D A T A RZ - D I R E C T I O N

STORY NAME	TORSIONAL PRESSURE	ELEV.	LOADED HEIGHT	LOADED BREADTH	WIND TORSION	ADDED TORSION	STORY TORSION	ACCUMULATED TORSION
Roof	0.0	18.0	1.8	17.5	0.0	0.0	0.0	0.0
5F	0.0	14.4	3.6	17.5	0.0	0.0	0.0	0.0
4F	0.0	10.8	3.6	27.624	0.0	0.0	0.0	0.0
3F	0.0	7.2	3.6	27.624	0.0	0.0	0.0	0.0
2F	0.0	3.6	3.6	33.049	0.0	0.0	0.0	0.0
G.L.	0.0	0.0	1.8	30.874	0.0	0.0	--	0.0

ECCENTRICITY RELATED DATA

STORY NAME	STORY FORCE(X)	STORY FORCE(Y)	ACCIDENTAL ECCENT.(X)	ACCIDENTAL ECCENT.(Y)	ACCIDENTAL TORSION(X)	ACCIDENTAL TORSION(Y)
Roof	0.0	2.2425488	0.0	0.0	0.0	0.0
5F	0.0	4.9239244	0.0	0.0	0.0	0.0
4F	0.0	5.2329302	0.0	0.0	0.0	0.0
3F	0.0	4.6793287	0.0	0.0	0.0	0.0
2F	0.0	4.145393	0.0	0.0	0.0	0.0
G.L.	--	--	0.0	0.0	--	--

14.20 RESPONSE SPECTRUM FUNCTION DATA

NAME	FUNCTION TYPE	SCALE	GRAVITY	DATA
Perfil de~	Normalized Acc.	1	9.806	0:0.2 0.01:0.22 0.02:0.24 0.03:0.26 0.04:0.28 0.05:0.3

14.21 RESPONSE SPECTRUM LOAD CASE DATA

NAME	FUNCTION NAME	DIR.	ANGLE	SCALE	PERIOD FACTOR	ACCIDENTAL ECCENTRICITY
EX	Perfil de Suel~	X-Y	0	0.9869	1	Automatic
EY	Perfil de Suel~	X-Y	90	0.8941	1	Automatic

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14.22 LOAD COMBINATION DATA

** CONCRETE DESIGN

NO	NAME	TYPE	ACTIVE	DESCRIPTION
1	cLCB1	Add	STRENGTH	1.4D
2	cLCB2	Add	STRENGTH	1.2(D) + 1.6(L)
3	cLCB3	Add	STRENGTH	1.2D + 1.0VX + 1.0L
4	cLCB4	Add	STRENGTH	1.2D + 1.0VY + 1.0L
5	cLCB5	Add	STRENGTH	1.2D - 1.0VX + 1.0L
6	cLCB6	Add	STRENGTH	1.2D - 1.0VY + 1.0L
7	cLCB7	Add	STRENGTH	1.2D + 1.0(0.244)(EX(RS)+EX(ES)) + 1.0L
8	cLCB8	Add	STRENGTH	1.2D + 1.0(0.244)(EX(RS)-EX(ES)) + 1.0L
9	cLCB9	Add	STRENGTH	1.2D + 1.0(0.244)(EY(RS)+EY(ES)) + 1.0L
10	cLCB10	Add	STRENGTH	1.2D + 1.0(0.244)(EY(RS)-EY(ES)) + 1.0L
11	cLCB11	Add	STRENGTH	1.2D - 1.0(0.244)(EX(RS)+EX(ES)) + 1.0L
12	cLCB12	Add	STRENGTH	1.2D - 1.0(0.244)(EX(RS)-EX(ES)) + 1.0L
13	cLCB13	Add	STRENGTH	1.2D - 1.0(0.244)(EY(RS)+EY(ES)) + 1.0L
14	cLCB14	Add	STRENGTH	1.2D - 1.0(0.244)(EY(RS)-EY(ES)) + 1.0L
15	cLCB15	Add	STRENGTH	0.9D + 1.0VX
16	cLCB16	Add	STRENGTH	0.9D + 1.0VY
17	cLCB17	Add	STRENGTH	0.9D - 1.0VX
18	cLCB18	Add	STRENGTH	0.9D - 1.0VY
19	cLCB19	Add	STRENGTH	0.9D + 1.0(0.244)(EX(RS)+EX(ES))
20	cLCB20	Add	STRENGTH	0.9D + 1.0(0.244)(EX(RS)-EX(ES))
21	cLCB21	Add	STRENGTH	0.9D + 1.0(0.244)(EY(RS)+EY(ES))
22	cLCB22	Add	STRENGTH	0.9D + 1.0(0.244)(EY(RS)-EY(ES))
23	cLCB23	Add	STRENGTH	0.9D - 1.0(0.244)(EX(RS)+EX(ES))
24	cLCB24	Add	STRENGTH	0.9D - 1.0(0.244)(EX(RS)-EX(ES))
25	cLCB25	Add	STRENGTH	0.9D - 1.0(0.244)(EY(RS)+EY(ES))
26	cLCB26	Add	STRENGTH	0.9D - 1.0(0.244)(EY(RS)-EY(ES))
27	cLCB27	Envelope	STRENGTH	Envolvente

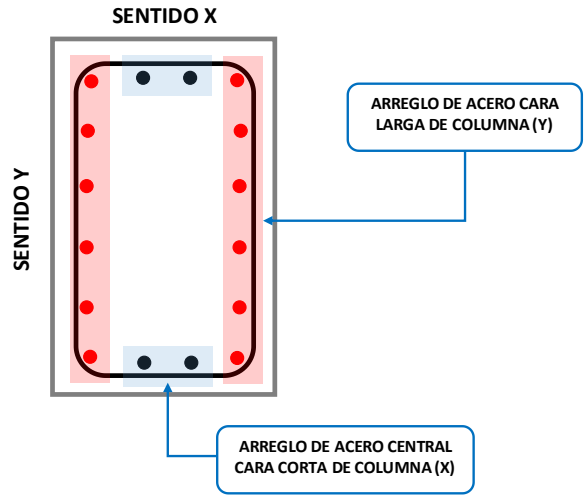
14.23 FOOTING DESIGN

NO	NAME	TYPE	ACTIVE	DESCRIPTION
1	CIM	Add	ACTIVE	

15. ANEXO 2
15.1 DISEÑO ESTRUCTURAL
15.1.1 DISEÑO DE COLUMNAS

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ESQUEMA GENERAL DE DISTRIBUCIÓN DE ACERO EN COLUMNAS RECTANGULARES Y CUADRADAS

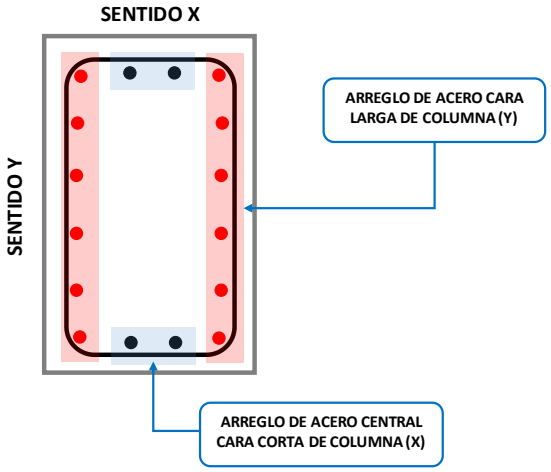


COLUMNAS ESTACIÓN DE BOMBEROS BOCAGRANDE

COLUMNA	NIVELES	SECCIÓN	AREA DE ACERO	ACERO DE REFURZO		CUANTIA DE COLUMNA	ARREGLO DE ACERO CENTRAL CARA CORTA DE COLUMNA (X)	ARREGLO DE ACERO CARA LARGA DE COLUMNA (Y)
				# VARILLA	CANTIDAD COLOCADA EN COLUMNA			
A/1	N+0.80	C50X55	51.10 cm2	# 6	18	1.87%	4 Barras # 6	5 Barras # 6
	N+4.40							
	N+4.40	C50X55	51.10 cm2	# 6	18	1.87%	4 Barras # 6	5 Barras # 6
	N+8.00							
	N+8.00	C50X55	34.10 cm2	# 5	18	1.30%	4 Barras # 5	5 Barras # 5
	N+11.60							
	N+11.60	C50X55	28.40 cm2	# 5	18	1.30%	4 Barras # 5	5 Barras # 5
	N+15.20							
A/2	N+0.80	C50X55	28.40 cm2	# 7	20	2.82%	4 Barras # 7	6 Barras # 7
	N+4.40							
	N+4.40	C50X55	73.81 cm2	# 7	20	2.82%	4 Barras # 7	6 Barras # 7
	N+8.00							
	N+8.00	C50X55	56.78 cm2	# 6	20	2.07%	4 Barras # 6	6 Barras # 6
	N+11.60							
	N+11.60	C50X55	28.40 cm2	# 6	20	2.07%	4 Barras # 6	6 Barras # 6
	N+15.20							
A/3'	N+0.80	C70	68.13 cm2	# 7	18	1.81%	3 Barras # 7	6 Barras # 7
	N+4.40							
	N+4.40	C50X50	68.13 cm2	# 7	18	2.79%	3 Barras # 7	6 Barras # 7
	N+8.00							
	N+8.00	C50X50	68.13 cm2	# 7	18	2.79%	3 Barras # 7	6 Barras # 7
	N+11.60							
A/4	N+0.80	C50X55	34.10 cm2	# 6	16	1.66%	3 Barras # 6	5 Barras # 6
	N+4.40							
	N+4.40	C50X55	45.42 cm2	# 6	16	1.66%	3 Barras # 6	5 Barras # 6
	N+8.00							
	N+8.00	C50X55	51.10 cm2	# 6	18	1.87%	4 Barras # 6	5 Barras # 6
	N+11.60							
	N+11.60	C50X55	28.39 cm2	# 5	18	1.30%	4 Barras # 5	5 Barras # 5
	N+15.20							

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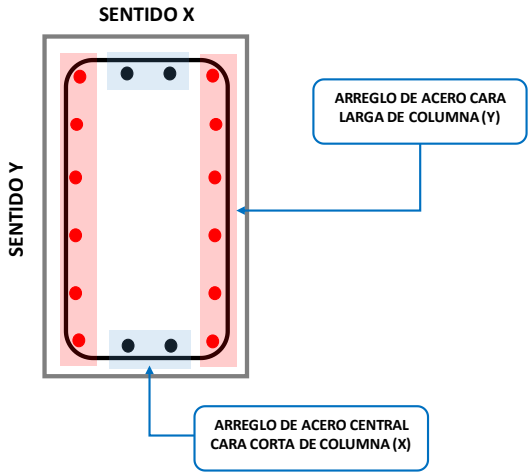


COLUMNAS ESTACIÓN DE BOMBEROS BOCAGRANDE

COLUMNA	NIVELES	SECCIÓN	AREA DE ACERO	ACERO DE REFURZO		CUANTIA DE COLUMNA	ARREGLO DE ACERO CENTRAL CARA CORTA DE COLUMNA (X)	ARREGLO DE ACERO CARA LARGA DE COLUMNA (Y)
				# VARILLA	CANTIDAD COLOCADA EN COLUMNA			
A'/1	N+0.80	C50X55	51.10 cm2	# 6	18	1.87%	4 Barras # 6	5 Barras # 6
	N+4.40							
	N+4.40	C50X55	51.10 cm2	# 6	18	1.87%	4 Barras # 6	5 Barras # 6
	N+8.00							
	N+8.00	C50X55	39.75 cm2	# 6	14	1.45%	3 Barras # 6	4 Barras # 6
	N+11.60							
	N+11.60	C50X55	28.39 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+15.20							
	N+15.20	C50X55	34.10 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+18.80							
A'/2	N+0.80	C50X55	39.75 cm2	# 7	16	2.26%	3 Barras # 7	5 Barras # 7
	N+4.40							
	N+4.40	C50X55	62.45 cm2	# 7	16	2.26%	3 Barras # 7	5 Barras # 7
	N+8.00							
	N+8.00	C50X55	73.81 cm2	# 7	20	2.82%	4 Barras # 7	6 Barras # 7
	N+11.60							
	N+11.60	C50X55	28.39 cm2	# 6	14	1.45%	3 Barras # 6	4 Barras # 6
	N+15.20							
	N+15.20	C50X55	28.39 cm2	# 6	14	1.45%	3 Barras # 6	4 Barras # 6
	N+18.80							
A'/3'	N+8.00	C50X50	68.13 cm2	# 7	18	2.79%	4 Barras # 7	5 Barras # 7
	N+11.60							
	N+11.60	C50X50	68.13 cm2	# 7	18	2.79%	4 Barras # 7	5 Barras # 7
	N+15.20							
	N+15.20	C50X50	62.45 cm2	# 7	16	2.48%	3 Barras # 7	5 Barras # 7
	N+18.80							
A'/4	N+0.80	C50X55	28.39 cm2	# 7	16	2.26%	3 Barras # 7	5 Barras # 7
	N+4.40							
	N+4.40	C50X55	62.45 cm2	# 7	16	2.26%	3 Barras # 7	5 Barras # 7
	N+8.00							
	N+8.00	C50X55	62.45 cm2	# 7	16	2.26%	3 Barras # 7	5 Barras # 7
	N+11.60							
	N+11.60	C50X55	39.75 cm2	# 6	14	1.45%	3 Barras # 6	4 Barras # 6
	N+15.20							

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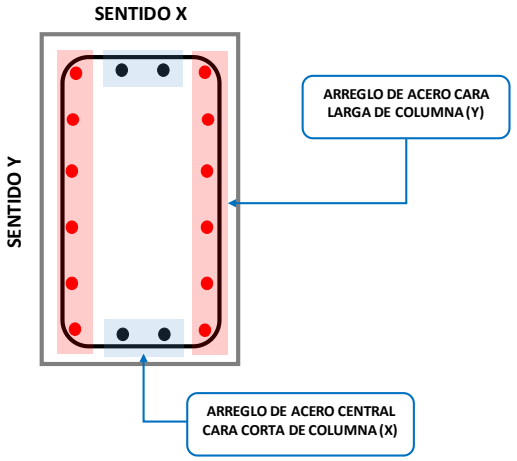


COLUMNAS ESTACIÓN DE BOMBEROS BOCAGRANDE

COLUMNA	NIVELES	SECCIÓN	AREA DE ACERO	ACERO DE REFUERZO		CUANTIA DE COLUMNA	ARREGLO DE ACERO CENTRAL CARA CORTA DE COLUMNA (X)	ARREGLO DE ACERO CARA LARGA DE COLUMNA (Y)
				# VARILLA	CANTIDAD COLOCADA EN COLUMNA			
B/1	N+0.80	C50X55	39.75 cm2	# 6	16	1.66%	3 Barras # 6	5 Barras # 6
	N+4.40							
	N+4.40	C50X55	45.42 cm2	# 6	16	1.66%	3 Barras # 6	5 Barras # 6
	N+8.00							
	N+8.00	C50X55	45.42 cm2	# 6	16	1.66%	3 Barras # 6	5 Barras # 6
	N+11.60							
	N+11.60	C50X55	28.39 cm2	# 5	14	1.01%	3 Barras # 5	4 Barras # 5
	N+15.20							
	N+15.20	C50X55	39.75 cm2	# 6	14	1.45%	3 Barras # 6	4 Barras # 6
	N+18.80							
B/2	N+0.80	C50X55	45.42 cm2	# 7	20	2.82%	4 Barras # 7	6 Barras # 7
	N+4.40							
	N+4.40	C50X55	73.81 cm2	# 7	20	2.82%	4 Barras # 7	6 Barras # 7
	N+8.00							
	N+8.00	C50X55	73.81 cm2	# 7	20	2.82%	4 Barras # 7	6 Barras # 7
	N+11.60							
	N+11.60	C50X55	56.78 cm2	# 6	20	2.07%	5 Barras # 6	5 Barras # 6
	N+15.20							
	N+15.20	C50X55	28.39 cm2	# 6	14	1.45%	2 Barras # 6	5 Barras # 6
	N+18.80							
B/3'	N+0.80	C70	79.50 cm2	# 7	20	2.02%	5 Barras # 7	5 Barras # 7
	N+4.40							
	N+4.40	C50X50	68.13 cm2	# 7	18	2.79%	4 Barras # 7	5 Barras # 7
	N+8.00							
	N+8.00	C50X50	68.13 cm2	# 7	18	2.79%	4 Barras # 7	5 Barras # 7
	N+11.60							
	N+11.60	C50X50	68.13 cm2	# 7	18	2.79%	4 Barras # 7	5 Barras # 7
	N+15.20							
B/4	N+0.80	C50X55	28.39 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+4.40							
	N+4.40	C50X55	28.39 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+8.00							
	N+8.00	C50X55	45.42 cm2	# 7	12	1.69%	2 Barras # 7	4 Barras # 7
	N+11.60							
	N+11.60	C50X55	28.39 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+15.20							

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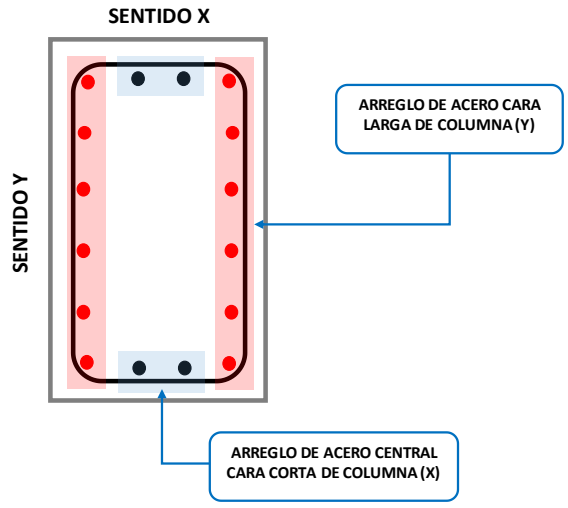
COLUMNAS ESTACIÓN DE BOMBEROS BOCAGRANDE

COLUMNA	NIVELES	SECCIÓN	AREA DE ACERO	ACERO DE REFURZO		CUANTIA DE COLUMNA	ARREGLO DE ACERO CENTRAL CARA CORTA DE COLUMNA (X)	ARREGLO DE ACERO CARA LARGA DE COLUMNA (Y)
				# VARILLA	CANTIDAD COLOCADA EN COLUMNA			
C/1	N+0.80	C50X55	34.10 cm2	# 7	16	2.26%	3 Barras # 7	5 Barras # 7
	N+4.40							
	N+4.40	C50X55	62.45 cm2	# 7	16	2.26%	3 Barras # 7	5 Barras # 7
	N+8.00							
	N+8.00	C50X55	73.81 cm2	# 7	20	2.82%	5 Barras # 7	5 Barras # 7
	N+11.60							
	N+11.60	C50X55	45.42 cm2	# 6	16	1.66%	3 Barras # 6	5 Barras # 6
	N+15.20							
	N+15.20	C50X55	34.10 cm2	# 6	16	1.66%	3 Barras # 6	5 Barras # 6
	N+18.80							
C/2	N+0.80	C50X55	62.45 cm2	# 7	20	2.82%	4 Barras # 7	6 Barras # 7
	N+4.40							
	N+4.40	C50X55	73.81 cm2	# 7	20	2.82%	4 Barras # 7	6 Barras # 7
	N+8.00							
	N+8.00	C50X55	73.81 cm2	# 7	20	2.82%	4 Barras # 7	6 Barras # 7
	N+11.60							
	N+11.60	C50X55	51.10 cm2	# 6	18	1.87%	4 Barras # 6	5 Barras # 6
	N+15.20							
	N+15.20	C50X55	39.75 cm2	# 6	18	1.87%	4 Barras # 6	5 Barras # 6
	N+18.80							
C/3	N+0.80	C50X55	28.39 cm2	# 7	20	2.82%	4 Barras # 7	6 Barras # 7
	N+4.40							
	N+4.40	C50X55	45.42 cm2	# 7	20	2.82%	4 Barras # 7	6 Barras # 7
	N+8.00							
	N+8.00	C50X55	73.81 cm2	# 7	20	2.82%	4 Barras # 7	6 Barras # 7
	N+11.60							
	N+11.60	C50X55	56.78 cm2	# 6	20	2.07%	4 Barras # 6	6 Barras # 6
	N+15.20							
	N+15.20	C50X55	34.10 cm2	# 6	18	1.87%	4 Barras # 6	5 Barras # 6
	N+18.80							
C/4	N+0.80	C50X55	28.39 cm2	# 5	18	1.30%	4 Barras # 5	5 Barras # 5
	N+4.40							
	N+4.40	C50X55	28.39 cm2	# 5	18	1.30%	4 Barras # 5	5 Barras # 5
	N+8.00							
	N+8.00	C50X55	51.10 cm2	# 6	18	1.87%	4 Barras # 6	5 Barras # 6
	N+11.60							
	N+11.60	C50X55	28.39 cm2	# 6	14	1.45%	3 Barras # 6	4 Barras # 6
	N+15.20							

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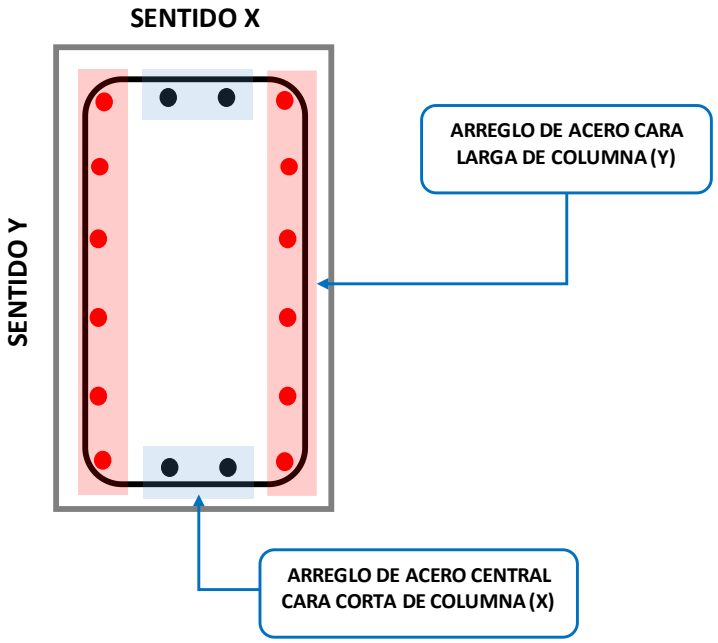
COLUMNAS ESTACIÓN DE BOMBEROS BOCAGRANDE

COLUMNA	NIVELES	SECCIÓN	AREA DE ACERO	ACERO DE REFURZO		CUANTIA DE COLUMNA	ARREGLO DE ACERO CENTRAL CARA CORTA DE COLUMNA (X)	ARREGLO DE ACERO CARA LARGA DE COLUMNA (Y)
				# VARILLA	CANTIDAD COLOCADA EN COLUMNA			
D/1	N+0.80	C50X55	28.39 cm2	# 5	16	1.15%	4 Barras # 5	4 Barras # 5
	N+4.40							
	N+4.40	C50X55	28.39 cm2	# 5	16	1.15%	4 Barras # 5	4 Barras # 5
	N+8.00							
	N+8.00	C50X55	39.75 cm2	# 6	16	1.66%	4 Barras # 6	4 Barras # 6
	N+11.60							
	N+11.60	C50X55	45.42 cm2	# 6	16	1.66%	4 Barras # 6	4 Barras # 6
	N+15.20							
D/2	N+0.80	C50X55	28.39 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+4.40							
	N+4.40	C50X55	28.39 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+8.00							
	N+8.00	C50X55	34.10 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+11.60							
	N+11.60	C50X55	28.39 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+15.20							
D/3	N+0.80	C50X55	28.39 cm2	# 7	16	2.26%	3 Barras # 7	5 Barras # 7
	N+4.40							
	N+4.40	C50X55	62.45 cm2	# 7	16	2.26%	3 Barras # 7	5 Barras # 7
	N+8.00							
	N+8.00	C50X55	28.39 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+11.60							
	N+11.60	C50X55	28.39 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+15.20							
D/4	N+0.80	C50X55	28.39 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+4.40							
	N+4.40	C50X55	28.39 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+8.00							
	N+8.00	C50X55	34.10 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+11.60							
	N+11.60	C50X55	28.39 cm2	# 6	12	1.24%	2 Barras # 6	4 Barras # 6
	N+15.20							

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COLUMNAS ESTACIÓN DE BOMBEROS BOCAGRANDE

COLUMNA	NIVELES	SECCIÓN	AREA DE ACERO	ACERO DE REFUERZO		CUANTIA DE COLUMNA	ARREGLO DE ACERO CENTRAL CARA CORTA DE COLUMNA (X)	ARREGLO DE ACERO CARA LARGA DE COLUMNA (Y)
				# VARILLA	CANTIDAD COLOCADA EN COLUMNA			
D'/2'	N+0.80	40X40	22.71 cm2	# 6	12	2.14%	2 Barras # 6	4 Barras # 6
	N+4.40							
	N+4.40	40X40	34.10 cm2	# 6	12	2.14%	2 Barras # 6	4 Barras # 6
	N+8.00							
D'/3	N+0.80	40X40	22.71 cm2	# 7	12	2.91%	2 Barras # 7	4 Barras # 7
	N+4.40							
	N+4.40	40X40	45.42 cm2	# 7	12	2.91%	2 Barras # 7	4 Barras # 7
	N+8.00							
D'/4	N+0.80	40X40	22.71 cm2	# 5	14	1.73%	2 Barras # 5	5 Barras # 5
	N+4.40							
	N+4.40	40X40	28.39 cm2	# 5	14	1.73%	2 Barras # 5	5 Barras # 5
	N+8.00							

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15.1.2 DISEÑO DE VIGAS

VP-101/2F

B=0.40 H=0.50 L=2.90			B=0.40 H=0.50 L=5.80		
Mu=-188.00 As =11.36 As(r)=11.87	Mu=-37.60 As =11.36 As(r)=5.81	Mu=-186.00 As =14.20 As(r)=11.74	Mu=-170.00 As =14.20 As(r)=10.68	Mu=-36.00 As =22.72 As(r)=5.81	Mu=-180.00 As =14.20 As(r)=11.34
Mu=167.00 As =11.36 As(r)=10.48	Mu=37.60 As =11.36 As(r)=5.81	Mu=130.00 As =11.36 As(r)=8.08	Mu=56.67 As =13.35 As(r)=5.81	Mu=71.60 As =11.36 As(r)=5.98	Mu=91.00 As =7.96 As(r)=5.81
Vu=-141.00	Vu=-132.00	Vu=141.00	Vu=-99.00	Vu=-47.20	Vu=95.00

VP-102/2F

B=0.45 H=0.50 L=7.78			B=0.45 H=0.50 L=7.80		
Mu=-401.00 As =28.85 As(r)=26.64	Mu=-84.00 As =30.96 As(r)=6.53	Mu=-420.00 As =28.85 As(r)=28.06	Mu=-425.00 As =28.85 As(r)=28.44	Mu=-97.00 As =29.50 As(r)=6.53	Mu=-485.00 As =28.85 As(r)=33.06
Mu=133.67 As =15.48 As(r)=8.28	Mu=171.00 As =15.48 As(r)=10.69	Mu=140.00 As =15.48 As(r)=8.69	Mu=141.67 As =15.48 As(r)=8.79	Mu=181.00 As =15.48 As(r)=11.34	Mu=161.67 As =15.48 As(r)=10.08
Vu=-207.00	Vu=90.65	Vu=211.00	Vu=-218.00	Vu=-94.15	Vu=301.00

B=0.45 H=0.50 L=5.70		
Mu=-453.00 As =28.85 As(r)=30.57	Mu=-90.60 As =35.33 As(r)=6.53	Mu=-390.00 As =25.51 As(r)=25.83
Mu=151.00 As =16.16 As(r)=9.39	Mu=165.00 As =15.48 As(r)=12.06	Mu=130.00 As =15.48 As(r)=8.05
Vu=-288.00	Vu=-83.15	Vu=244.00

VP-103/2F

B=0.50 H=0.50 L=7.84			B=0.50 H=0.50 L=7.80		
Mu=-736.00 As =47.52 As(r)=53.40	Mu=-147.20 As =51.00 As(r)=9.12	Mu=-736.00 As =47.52 As(r)=53.40	Mu=-459.00 As =47.52 As(r)=30.60	Mu=-91.80 As =44.27 As(r)=7.26	Mu=-377.00 As =32.72 As(r)=24.61
Mu=245.33 As =25.50 As(r)=15.52	Mu=392.00 As =25.50 As(r)=25.69	Mu=245.33 As =19.35 As(r)=15.52	Mu=153.00 As =19.35 As(r)=9.49	Mu=132.00 As =25.50 As(r)=8.15	Mu=125.67 As =19.35 As(r)=7.75
Vu=-420.00	Vu=164.65	Vu=419.00	Vu=-216.00	Vu=-89.60	Vu=214.00

B=0.50 H=0.50 L=5.70		
Mu=-361.00 As =32.72 As(r)=23.47	Mu=-72.20 As =43.75 As(r)=7.26	Mu=-328.00 As =29.38 As(r)=21.16
Mu=174.00 As =21.88 As(r)=10.84	Mu=82.60 As =25.50 As(r)=7.26	Mu=202.00 As =19.35 As(r)=12.66
Vu=-206.00	Vu=79.60	Vu=155.00

VP-104/2F

B=0.50 H=0.50 L=7.89		
Mu=-628.00 As =44.85 As(r)=43.96	Mu=-125.60 As =19.35 As(r)=7.74	Mu=-626.00 As =44.85 As(r)=43.79
Mu=209.33 As =19.35 As(r)=13.14	Mu=305.00 As =19.35 As(r)=19.57	Mu=208.67 As =19.35 As(r)=13.10
Vu=-313.00	Vu=-152.85	Vu=333.00

VP-105/2F

B=0.50 H=0.50 L=7.93		
Mu=-599.00 As =44.85 As(r)=41.56	Mu=-119.80 As =19.35 As(r)=7.38	Mu=-587.00 As =44.85 As(r)=40.58
Mu=199.67 As =19.35 As(r)=12.51	Mu=251.00 As =19.35 As(r)=15.90	Mu=195.67 As =19.35 As(r)=12.25
Vu=-280.00	Vu=139.65	Vu=292.00

VP-106/2F

B=0.45 H=0.50 L=7.96		
Mu=-526.00 As =38.70 As(r)=36.33	Mu=-106.40 As =19.35 As(r)=6.55	Mu=-532.00 As =38.70 As(r)=36.82
Mu=175.33 As =19.35 As(r)=10.97	Mu=199.00 As =19.35 As(r)=12.52	Mu=177.33 As =19.35 As(r)=11.10
Vu=-224.00	Vu=-139.65	Vu=268.00

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VP-107/2F

B=0.40 H=0.50 L=4.68			B=0.40 H=0.50 L=1.52		
Mu=-285.00 As =18.72 As(r)=18.51	Mu=-57.00 As =11.36 As(r)=5.81	Mu=-265.00 As =18.72 As(r)=17.11	Mu=-268.00 As =18.72 As(r)=17.32	Mu=-150.00 As =18.72 As(r)=10.92	Mu=-53.60 As =14.56 As(r)=5.81
Mu=235.00 As =15.48 As(r)=15.04	Mu=57.00 As =15.48 As(r)=5.81	Mu=218.00 As =15.48 As(r)=13.88	Mu=193.00 As =15.48 As(r)=12.20	Mu=136.00 As =15.48 As(r)=9.22	Mu=85.00 As =15.48 As(r)=5.83
Vu=-145.00	Vu=104.00	Vu=144.00	Vu=-142.00	Vu=-137.00	Vu=-133.00

B=0.30 H=0.50 L=2.67			B=0.40 H=0.50 L=7.16		
Mu=-51.00 As =8.52 As(r)=4.36	Mu=-65.00 As =24.40 As(r)=6.04	Mu=-248.00 As =15.88 As(r)=16.34	Mu=-230.00 As =18.72 As(r)=14.69	Mu=-48.40 As =22.72 As(r)=5.81	Mu=-242.00 As =18.72 As(r)=15.52
Mu=91.00 As =11.61 As(r)=5.64	Mu=75.00 As =15.48 As(r)=5.80	Mu=174.00 As =11.61 As(r)=11.12	Mu=120.00 As =13.60 As(r)=7.44	Mu=48.40 As =15.48 As(r)=5.81	Mu=116.00 As =11.53 As(r)=7.18
Vu=102.00	Vu=119.00	Vu=140.00	Vu=-105.00	Vu=47.00	Vu=107.00

B=0.40 H=0.50 L=7.77		
Mu=-247.00 As =18.72 As(r)=15.86	Mu=-49.40 As =22.72 As(r)=5.81	Mu=-244.00 As =18.72 As(r)=15.65
Mu=106.00 As =11.36 As(r)=6.55	Mu=52.00 As =15.48 As(r)=5.81	Mu=123.00 As =11.36 As(r)=7.63
Vu=-109.00	Vu=-44.00	Vu=105.00

VP-108/2F

B=0.40 H=0.50 L=4.68			B=0.40 H=0.50 L=4.44		
Mu=-256.00 As =16.27 As(r)=16.48	Mu=-51.20 As =15.32 As(r)=5.81	Mu=-221.00 As =27.63 As(r)=14.08	Mu=-231.00 As =16.27 As(r)=14.76	Mu=-47.20 As =11.36 As(r)=5.81	Mu=-236.00 As =16.27 As(r)=15.10
Mu=191.00 As =11.36 As(r)=12.07	Mu=51.20 As =11.36 As(r)=5.81	Mu=187.00 As =11.36 As(r)=11.80	Mu=180.00 As =11.36 As(r)=11.34	Mu=47.20 As =11.36 As(r)=5.81	Mu=187.00 As =11.36 As(r)=11.80
Vu=-132.00	Vu=-92.00	Vu=124.00	Vu=-128.00	Vu=-91.00	Vu=128.00

B=0.40 H=0.50 L=7.16			B=0.40 H=0.50 L=7.77		
Mu=-193.00 As =16.27 As(r)=12.20	Mu=-47.40 As =22.72 As(r)=5.81	Mu=-237.00 As =24.73 As(r)=15.17	Mu=-335.00 As =24.73 As(r)=22.10	Mu=-67.00 As =21.97 As(r)=5.81	Mu=-324.00 As =24.73 As(r)=21.30
Mu=98.00 As =11.36 As(r)=6.04	Mu=47.40 As =11.36 As(r)=5.81	Mu=79.00 As =11.36 As(r)=5.81	Mu=111.67 As =11.36 As(r)=6.91	Mu=156.00 As =11.36 As(r)=10.81	Mu=108.00 As =11.36 As(r)=6.67
Vu=-93.00	Vu=44.00	Vu=104.00	Vu=-188.00	Vu=67.50	Vu=171.00

VP-109/2F

B=0.40 H=0.50 L=4.21		
Mu=-74.00 As =11.36 As(r)=5.81	Mu=-69.00 As =11.36 As(r)=5.81	Mu=-187.00 As =11.36 As(r)=11.80
Mu=37.40 As =11.36 As(r)=5.81	Mu=37.40 As =11.36 As(r)=5.81	Mu=62.33 As =11.36 As(r)=5.81
Vu=-55.00	Vu=37.00	Vu=70.00

VP-110/2F

B=0.40 H=0.50 L=7.77			B=0.40 H=0.50 L=4.16		
Mu=-392.00 As =24.73 As(r)=26.35	Mu=-78.40 As =22.72 As(r)=5.81	Mu=-366.00 As =24.73 As(r)=24.39	Mu=-246.00 As =24.73 As(r)=15.79	Mu=-49.20 As =11.81 As(r)=5.81	Mu=-189.00 As =11.36 As(r)=11.93
Mu=130.67 As =15.48 As(r)=9.39	Mu=207.00 As =15.48 As(r)=15.65	Mu=122.00 As =11.36 As(r)=9.39	Mu=136.00 As =11.36 As(r)=8.46	Mu=49.20 As =15.48 As(r)=5.81	Mu=155.00 As =11.36 As(r)=9.70
Vu=-252.00	Vu=92.70	Vu=193.00	Vu=-146.00	Vu=-94.00	Vu=123.00

VP-111/2F

B=0.40 H=0.50 L=4.68			B=0.40 H=0.50 L=4.44		
Mu=-221.00 As =16.27 As(r)=14.08	Mu=-44.20 As =11.36 As(r)=5.81	Mu=-191.00 As =16.27 As(r)=12.07	Mu=-194.00 As =16.27 As(r)=12.27	Mu=-40.60 As =22.72 As(r)=5.81	Mu=-203.00 As =16.27 As(r)=12.87
Mu=191.00 As =11.36 As(r)=12.07	Mu=44.20 As =11.36 As(r)=5.81	Mu=184.00 As =11.36 As(r)=11.60	Mu=181.00 As =11.36 As(r)=11.40	Mu=40.60 As =11.36 As(r)=5.81	Mu=184.00 As =11.36 As(r)=11.60
Vu=-99.00	Vu=-86.00	Vu=93.00	Vu=-96.00	Vu=85.00	Vu=98.00

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B=0.40 H=0.50 L=7.16			B=0.40 H=0.50 L=0.12		
Mu=-148.00 As =16.27 As(r)=9.24	Mu=-35.20 As =22.72 As(r)=5.81	Mu=-176.00 As =16.27 As(r)=11.07	Mu=-242.00 As =16.27 As(r)=15.52	Mu=-225.00 As =16.27 As(r)=14.57	Mu=-208.00 As =16.27 As(r)=13.42
Mu=114.00 As =11.36 As(r)=7.05	Mu=35.20 As =11.36 As(r)=5.81	Mu=105.00 As =15.94 As(r)=6.48	Mu=80.67 As =11.36 As(r)=5.81	Mu=48.40 As =11.36 As(r)=5.81	Mu=69.33 As =11.36 As(r)=5.81
Vu=-54.00	Vu=40.00	Vu=61.00	Vu=-151.00	Vu=-149.00	Vu=-147.00

B=0.30 H=0.50 L=2.68			B=0.40 H=0.50 L=4.47		
Mu=-206.00 As =13.43 As(r)=13.34	Mu=-47.00 As =12.48 As(r)=4.45	Mu=-41.20 As =8.52 As(r)=4.36	Mu=-49.00 As =11.36 As(r)=5.81	Mu=-49.00 As =18.23 As(r)=5.81	Mu=-245.00 As =18.72 As(r)=15.72
Mu=68.67 As =8.52 As(r)=4.36	Mu=68.00 As =11.36 As(r)=4.94	Mu=119.00 As =8.52 As(r)=7.45	Mu=118.00 As =11.36 As(r)=7.31	Mu=74.00 As =11.36 As(r)=5.81	Mu=81.67 As =16.17 As(r)=5.81
Vu=-120.00	Vu=-102.00	Vu=-83.00	Vu=38.00	Vu=78.00	Vu=117.00

B=0.40 H=0.50 L=4.16		
Mu=-225.00 As =18.72 As(r)=14.35	Mu=-45.00 As =11.36 As(r)=5.81	Mu=-192.00 As =16.27 As(r)=12.13
Mu=164.00 As =11.36 As(r)=10.28	Mu=45.00 As =11.36 As(r)=5.81	Mu=163.00 As =11.36 As(r)=10.22
Vu=-127.00	Vu=-92.00	Vu=117.00

VS-101/2F

B=0.35 H=0.50 L=7.90			B=0.35 H=0.50 L=5.85		
Mu=-91.00 As =8.52 As(r)=5.62	Mu=-23.60 As =17.04 As(r)=5.08	Mu=-118.00 As =8.52 As(r)=7.34	Mu=-118.00 As =8.52 As(r)=7.34	Mu=-23.60 As =17.04 As(r)=5.08	Mu=-54.00 As =8.52 As(r)=5.08
Mu=30.33 As =8.52 As(r)=5.08	Mu=113.00 As =8.52 As(r)=7.02	Mu=39.33 As =8.52 As(r)=5.08	Mu=39.33 As =8.52 As(r)=5.08	Mu=77.80 As =8.52 As(r)=5.49	Mu=23.60 As =8.52 As(r)=5.08
Vu=-72.00	Vu=44.25	Vu=76.00	Vu=-72.00	Vu=-41.40	Vu=72.00

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VS-102/2F

B=0.20 H=0.50 L=1.71		
Mu=-12.60 As =3.98 As(r)=2.90	Mu=-55.00 As =3.98 As(r)=3.40	Mu=-63.00 As =3.98 As(r)=3.91
Mu=28.00 As =3.98 As(r)=2.90	Mu=15.20 As =3.98 As(r)=2.90	Mu=21.00 As =3.98 As(r)=2.90
Vu=69.00	Vu=34.00	Vu=34.00

VS-103/2F

B=0.25 H=0.50 L=3.93		
Mu=-89.00 As =5.68 As(r)=5.55	Mu=-27.60 As =5.68 As(r)=3.63	Mu=-0.00 As =5.68 As(r)=3.63
Mu=17.80 As =3.98 As(r)=3.63	Mu=63.60 As =3.98 As(r)=4.01	Mu=38.10 As =3.98 As(r)=3.63
Vu=-48.00	Vu=-12.10	Vu=26.00

VS-104/2F

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=7.84		
Mu=-105.00 As =8.52 As(r)=6.54	Mu=-37.00 As =17.04 As(r)=4.36	Mu=-185.00 As =13.43 As(r)=11.88	Mu=-191.00 As =13.43 As(r)=12.29	Mu=-38.20 As =17.04 As(r)=4.36	Mu=-103.00 As =8.52 As(r)=6.41
Mu=37.00 As =8.52 As(r)=4.36	Mu=84.00 As =8.52 As(r)=5.19	Mu=61.67 As =8.52 As(r)=4.36	Mu=63.67 As =8.52 As(r)=4.36	Mu=117.00 As =8.52 As(r)=7.32	Mu=38.20 As =8.52 As(r)=4.36
Vu=-98.00	Vu=18.00	Vu=122.00	Vu=-131.00	Vu=-19.00	Vu=105.00

VS-105/2F

B=0.25 H=0.50 L=1.55		
Mu=-51.00 As =3.98 As(r)=3.63	Mu=-19.00 As =3.98 As(r)=3.63	Mu=-9.00 As =3.98 As(r)=3.63
Mu=10.20 As =3.98 As(r)=3.63	Mu=1.00 As =3.98 As(r)=3.63	Mu=11.00 As =3.98 As(r)=3.63
Vu=-43.00	Vu=-32.00	Vu=-21.00

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VS-107/2F

B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-71.00 As =8.52 As(r)=4.37	Mu=-21.80 As =8.52 As(r)=4.36	Mu=-109.00 As =8.52 As(r)=6.80	Mu=-102.00 As =8.52 As(r)=6.35	Mu=-33.20 As =17.04 As(r)=4.36	Mu=-166.00 As =13.43 As(r)=10.58
Mu=23.67 As =8.52 As(r)=4.36	Mu=21.80 As =8.52 As(r)=4.36	Mu=36.33 As =8.52 As(r)=4.36	Mu=34.00 As =8.52 As(r)=4.36	Mu=76.00 As =17.04 As(r)=4.69	Mu=55.33 As =8.52 As(r)=4.36
Vu=-71.00	Vu=15.40	Vu=79.00	Vu=-101.00	Vu=10.00	Vu=117.00

B=0.30 H=0.50 L=7.84		
Mu=-173.00 As =13.43 As(r)=11.06	Mu=-34.60 As =17.04 As(r)=4.36	Mu=-74.00 As =8.52 As(r)=4.56
Mu=57.67 As =8.52 As(r)=4.36	Mu=128.00 As =11.96 As(r)=8.04	Mu=34.60 As =8.52 As(r)=4.36
Vu=-131.00	Vu=-16.00	Vu=104.00

VS-108/2F

B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-74.00 As =8.52 As(r)=4.56	Mu=-21.20 As =8.52 As(r)=4.36	Mu=-106.00 As =8.52 As(r)=6.61	Mu=-117.00 As =8.52 As(r)=7.32	Mu=-35.40 As =17.04 As(r)=4.36	Mu=-177.00 As =13.43 As(r)=11.33
Mu=24.67 As =8.52 As(r)=4.36	Mu=21.20 As =8.52 As(r)=4.36	Mu=35.33 As =8.52 As(r)=4.36	Mu=39.00 As =8.52 As(r)=4.36	Mu=73.00 As =17.04 As(r)=4.50	Mu=59.00 As =8.52 As(r)=4.36
Vu=-69.00	Vu=15.00	Vu=80.00	Vu=-101.00	Vu=13.00	Vu=119.00

B=0.30 H=0.50 L=7.84		
Mu=-185.00 As =13.43 As(r)=11.88	Mu=-37.00 As =17.04 As(r)=4.36	Mu=-98.00 As =8.52 As(r)=6.09
Mu=61.67 As =8.52 As(r)=4.36	Mu=122.00 As =11.96 As(r)=7.65	Mu=37.00 As =8.52 As(r)=4.36
Vu=-131.00	Vu=-18.00	Vu=106.00

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VS-109/2F

B=0.30 H=0.50 L=2.97		
Mu=-54.00 As =8.52 As(r)=4.36	Mu=-24.20 As =8.52 As(r)=4.36	Mu=-121.00 As =8.52 As(r)=7.58
Mu=24.20 As =8.52 As(r)=4.36	Mu=115.60 As =8.52 As(r)=7.23	Mu=40.33 As =8.52 As(r)=4.36
Vu=-86.00	Vu=-17.65	Vu=113.00

VS-109(1)/2F

B=0.30 H=0.50 L=2.97		
Mu=-101.00 As =8.52 As(r)=6.28	Mu=-0.00 As =8.52 As(r)=4.36	Mu=-0.00 As =8.52 As(r)=4.36
Mu=20.20 As =8.52 As(r)=4.36	Mu=68.00 As =8.52 As(r)=4.87	Mu=107.00 As =8.52 As(r)=6.67
Vu=-100.00	Vu=-55.00	Vu=-11.00

VS-109(2)/2F

B=0.30 H=0.50 L=2.97		
Mu=-57.00 As =8.52 As(r)=4.36	Mu=-0.00 As =8.52 As(r)=4.36	Mu=-0.00 As =8.52 As(r)=4.36
Mu=11.40 As =8.52 As(r)=4.36	Mu=72.00 As =8.52 As(r)=4.98	Mu=91.00 As =8.52 As(r)=5.70
Vu=-86.00	Vu=-38.00	Vu=11.00

VS-110/2F

B=0.20 H=0.50 L=0.45		
Mu=-52.00 As =5.68 As(r)=3.21	Mu=-24.00 As =5.68 As(r)=2.90	Mu=-8.00 As =5.68 As(r)=2.90
Mu=10.40 As =3.98 As(r)=2.90	Mu=0.00 As =3.98 As(r)=2.90	Mu=4.00 As =3.98 As(r)=2.90
Vu=-73.00	Vu=-68.00	Vu=-63.00

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VS-111/2F

B=0.30 H=0.50 L=2.97		
Mu=-112.00 As =8.52 As(r)=7.00	Mu=-6.20 As =8.52 As(r)=4.36	Mu=-0.00 As =8.52 As(r)=4.36
Mu=22.40 As =8.52 As(r)=4.36	Mu=81.00 As =8.52 As(r)=5.50	Mu=104.00 As =8.52 As(r)=6.48
Vu=-111.00	Vu=-56.30	Vu=-15.00

VP-201/3F

B=0.40 H=0.50 L=0.40			B=0.40 H=0.50 L=2.90		
Mu=-0.00 As =2.84 As(r)=5.81	Mu=-0.00 As =11.36 As(r)=5.81	Mu=-1.00 As =11.36 As(r)=5.81	Mu=-140.00 As =11.36 As(r)=8.72	Mu=-29.20 As =11.36 As(r)=5.81	Mu=-146.00 As =11.36 As(r)=9.11
Mu=0.00 As =2.84 As(r)=5.81	Mu=0.00 As =11.36 As(r)=5.81	Mu=0.20 As =11.36 As(r)=5.81	Mu=123.00 As =11.36 As(r)=7.63	Mu=29.20 As =11.36 As(r)=5.81	Mu=83.00 As =11.36 As(r)=5.81
Vu=0.00	Vu=2.00	Vu=3.00	Vu=-108.00	Vu=-99.00	Vu=113.00

B=0.40 H=0.50 L=5.80			B=0.40 H=0.50 L=1.00		
Mu=-143.00 As =11.36 As(r)=8.92	Mu=-34.80 As =22.72 As(r)=5.81	Mu=-174.00 As =14.80 As(r)=10.94	Mu=-41.00 As =14.80 As(r)=5.81	Mu=-20.00 As =14.80 As(r)=5.81	Mu=-4.00 As =14.80 As(r)=5.81
Mu=47.67 As =11.36 As(r)=5.81	Mu=65.60 As =11.36 As(r)=5.81	Mu=66.30 As =11.36 As(r)=5.81	Mu=8.20 As =11.36 As(r)=5.81	Mu=0.00 As =11.36 As(r)=5.81	Mu=2.00 As =11.36 As(r)=5.81
Vu=-89.00	Vu=-37.20	Vu=91.00	Vu=-38.00	Vu=-34.00	Vu=-31.00

VP-202/3F

B=0.45 H=0.50 L=7.78			B=0.45 H=0.50 L=7.80		
Mu=-409.00 As =28.85 As(r)=27.24	Mu=-85.20 As =30.96 As(r)=6.53	Mu=-426.00 As =32.19 As(r)=28.51	Mu=-441.00 As =32.19 As(r)=29.65	Mu=-99.80 As =28.47 As(r)=6.53	Mu=-499.00 As =37.50 As(r)=34.16
Mu=136.33 As =15.48 As(r)=8.45	Mu=170.00 As =15.48 As(r)=10.62	Mu=142.00 As =15.48 As(r)=8.81	Mu=147.00 As =15.48 As(r)=9.14	Mu=187.00 As =15.48 As(r)=11.73	Mu=166.33 As =15.48 As(r)=10.39
Vu=-210.00	Vu=91.65	Vu=212.00	Vu=-222.00	Vu=-100.20	Vu=296.00

B=0.45 H=0.50 L=5.70			B=0.45 H=0.50 L=0.95		
Mu=-450.00 As =37.50 As(r)=30.34	Mu=-90.00 As =27.43 As(r)=6.53	Mu=-437.00 As =28.85 As(r)=29.34	Mu=-94.00 As =28.85 As(r)=6.53	Mu=-46.00 As =28.85 As(r)=6.53	Mu=-2.00 As =28.85 As(r)=6.53
Mu=150.00 As =20.21 As(r)=9.33	Mu=181.00 As =15.48 As(r)=11.34	Mu=145.67 As =15.48 As(r)=9.05	Mu=18.80 As =15.48 As(r)=6.53	Mu=0.00 As =15.48 As(r)=6.53	Mu=4.00 As =15.48 As(r)=6.53
Vu=-291.00	Vu=-74.65	Vu=262.00	Vu=-92.00	Vu=-88.00	Vu=-85.00

VP-203/3F

B=0.55 H=0.50 L=7.84			B=0.55 H=0.50 L=7.80		
Mu=-730.00 As =47.52 As(r)=51.68	Mu=-153.40 As =51.00 As(r)=9.49	Mu=-767.00 As =52.62 As(r)=54.91	Mu=-729.00 As =52.62 As(r)=51.60	Mu=-145.80 As =51.00 As(r)=9.00	Mu=-698.00 As =47.52 As(r)=48.96
Mu=243.33 As =25.50 As(r)=15.31	Mu=372.00 As =25.50 As(r)=24.05	Mu=255.67 As =25.50 As(r)=16.13	Mu=243.00 As =25.50 As(r)=15.29	Mu=365.00 As =25.50 As(r)=23.57	Mu=232.67 As =25.50 As(r)=14.61
Vu=-414.00	Vu=168.15	Vu=421.00	Vu=-405.00	Vu=173.65	Vu=436.00

B=0.55 H=0.50 L=5.70			B=0.55 H=0.50 L=0.95		
Mu=-507.00 As =47.52 As(r)=33.82	Mu=-101.40 As =41.73 As(r)=7.99	Mu=-451.00 As =36.06 As(r)=29.69	Mu=-113.00 As =36.06 As(r)=7.99	Mu=-55.00 As =36.06 As(r)=7.99	Mu=-0.00 As =36.06 As(r)=7.99
Mu=169.00 As =33.10 As(r)=10.48	Mu=169.00 As =25.50 As(r)=10.48	Mu=150.33 As =19.35 As(r)=9.29	Mu=22.60 As =19.35 As(r)=7.99	Mu=0.00 As =25.50 As(r)=7.99	Mu=1.00 As =19.35 As(r)=7.99
Vu=-349.00	Vu=-104.00	Vu=248.00	Vu=-109.00	Vu=-105.00	Vu=-102.00

VP-204/3F

B=0.55 H=0.50 L=7.89			B=0.55 H=0.50 L=9.05		
Mu=-576.00 As =47.52 As(r)=39.09	Mu=-134.00 As =51.00 As(r)=8.26	Mu=-670.00 As =52.62 As(r)=46.62	Mu=-746.00 As =52.62 As(r)=53.07	Mu=-153.40 As =37.51 As(r)=9.49	Mu=-767.00 As =52.62 As(r)=54.91
Mu=192.00 As =25.50 As(r)=11.96	Mu=277.00 As =25.50 As(r)=17.55	Mu=223.33 As =25.50 As(r)=14.00	Mu=248.67 As =25.50 As(r)=15.67	Mu=364.00 As =25.50 As(r)=23.50	Mu=255.67 As =34.97 As(r)=16.13
Vu=-292.00	Vu=147.60	Vu=340.00	Vu=-372.00	Vu=66.00	Vu=497.00

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B=0.55 H=0.50 L=4.25			B=0.55 H=0.50 L=0.95		
Mu=-541.00 As =52.62 As(r)=36.39	Mu=-108.20 As =42.81 As(r)=7.99	Mu=-419.00 As =36.06 As(r)=27.38	Mu=-82.00 As =36.06 As(r)=7.99	Mu=-39.00 As =36.06 As(r)=7.99	Mu=-0.00 As =36.06 As(r)=7.99
Mu=180.33 As =19.35 As(r)=11.21	Mu=114.00 As =25.50 As(r)=7.99	Mu=253.00 As =19.35 As(r)=15.95	Mu=16.40 As =19.35 As(r)=7.99	Mu=0.00 As =25.50 As(r)=7.99	Mu=4.00 As =19.35 As(r)=7.99
Vu=-323.00	Vu=-308.00	Vu=238.00	Vu=-83.00	Vu=-79.00	Vu=-75.00

VP-205/3F

B=0.50 H=0.50 L=7.93			B=0.50 H=0.50 L=9.15		
Mu=-535.00 As =36.06 As(r)=36.42	Mu=-122.80 As =44.11 As(r)=7.57	Mu=-614.00 As =47.52 As(r)=42.79	Mu=-721.00 As =47.52 As(r)=52.04	Mu=-144.20 As =37.02 As(r)=8.93	Mu=-263.00 As =26.03 As(r)=16.71
Mu=178.33 As =19.35 As(r)=11.12	Mu=222.00 As =19.35 As(r)=13.97	Mu=204.67 As =19.35 As(r)=12.83	Mu=240.33 As =19.35 As(r)=15.19	Mu=261.00 As =19.35 As(r)=17.45	Mu=144.20 As =36.47 As(r)=10.47
Vu=-255.00	Vu=140.60	Vu=294.00	Vu=-321.00	Vu=-43.85	Vu=138.00

B=0.50 H=0.50 L=4.35			B=0.50 H=0.50 L=0.95		
Mu=-131.20 As =26.03 As(r)=8.10	Mu=-131.20 As =44.49 As(r)=8.28	Mu=-656.00 As =47.52 As(r)=46.33	Mu=-79.00 As =47.52 As(r)=7.26	Mu=-42.00 As =47.52 As(r)=7.26	Mu=-9.00 As =47.52 As(r)=7.26
Mu=381.00 As =25.50 As(r)=24.90	Mu=131.20 As =19.35 As(r)=8.10	Mu=218.67 As =25.50 As(r)=13.75	Mu=15.80 As =25.50 As(r)=7.26	Mu=0.00 As =19.35 As(r)=7.26	Mu=0.00 As =25.50 As(r)=7.26
Vu=166.05	Vu=294.00	Vu=310.00	Vu=-73.00	Vu=-69.00	Vu=-65.00

VP-206/3F

B=0.45 H=0.50 L=7.96			B=0.45 H=0.50 L=9.05		
Mu=-446.00 As =36.06 As(r)=30.03	Mu=-101.40 As =38.70 As(r)=6.53	Mu=-507.00 As =41.37 As(r)=34.80	Mu=-545.00 As =41.37 As(r)=37.88	Mu=-119.40 As =41.73 As(r)=7.37	Mu=-597.00 As =43.12 As(r)=42.26
Mu=167.00 As =19.35 As(r)=10.43	Mu=152.00 As =19.35 As(r)=9.53	Mu=169.00 As =19.35 As(r)=10.56	Mu=181.67 As =19.35 As(r)=11.38	Mu=196.00 As =19.35 As(r)=12.33	Mu=199.00 As =38.16 As(r)=12.52
Vu=-193.00	Vu=-107.15	Vu=252.00	Vu=-273.00	Vu=38.00	Vu=419.00

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B=0.45 H=0.50 L=4.25			B=0.45 H=0.50 L=0.95		
Mu=-504.00 As =43.12 As(r)=34.56	Mu=-100.80 As =43.17 As(r)=6.53	Mu=-405.00 As =47.52 As(r)=26.94	Mu=-97.00 As =47.52 As(r)=6.53	Mu=-48.00 As =47.52 As(r)=6.53	Mu=-4.00 As =47.52 As(r)=6.53
Mu=248.00 As =25.50 As(r)=15.80	Mu=100.80 As =19.35 As(r)=6.53	Mu=298.00 As =25.50 As(r)=19.24	Mu=19.40 As =25.50 As(r)=6.53	Mu=9.00 As =19.35 As(r)=6.53	Mu=9.00 As =25.50 As(r)=6.53
Vu=-294.00	Vu=-280.00	Vu=219.00	Vu=-93.00	Vu=-90.00	Vu=-86.00

VP-207/3F

B=0.40 H=0.50 L=4.68			B=0.40 H=0.50 L=1.52		
Mu=-294.00 As =18.72 As(r)=19.15	Mu=-58.80 As =11.36 As(r)=5.81	Mu=-257.00 As =18.72 As(r)=16.55	Mu=-276.00 As =18.72 As(r)=17.88	Mu=-156.00 As =18.72 As(r)=11.34	Mu=-55.20 As =14.56 As(r)=5.81
Mu=226.00 As =15.48 As(r)=14.42	Mu=58.80 As =15.48 As(r)=5.81	Mu=225.00 As =15.48 As(r)=14.35	Mu=196.00 As =15.48 As(r)=12.40	Mu=138.00 As =15.48 As(r)=9.34	Mu=85.00 As =15.48 As(r)=5.86
Vu=-149.00	Vu=-108.00	Vu=140.00	Vu=-145.00	Vu=-141.00	Vu=-136.00

B=0.30 H=0.50 L=2.67			B=0.40 H=0.50 L=7.16		
Mu=-53.00 As =8.52 As(r)=4.36	Mu=-64.00 As =24.40 As(r)=5.97	Mu=-245.00 As =15.88 As(r)=16.12	Mu=-238.00 As =18.72 As(r)=15.24	Mu=-47.80 As =22.72 As(r)=5.81	Mu=-239.00 As =18.72 As(r)=15.31
Mu=92.00 As =11.61 As(r)=5.71	Mu=77.00 As =15.48 As(r)=6.03	Mu=181.00 As =11.61 As(r)=11.60	Mu=119.00 As =13.60 As(r)=7.37	Mu=47.80 As =15.48 As(r)=5.81	Mu=122.00 As =11.53 As(r)=7.56
Vu=101.00	Vu=118.00	Vu=140.00	Vu=-107.00	Vu=46.00	Vu=107.00

B=0.40 H=0.50 L=7.77		
Mu=-241.00 As =18.72 As(r)=15.45	Mu=-49.60 As =22.72 As(r)=5.81	Mu=-248.00 As =18.72 As(r)=15.93
Mu=108.00 As =11.36 As(r)=6.67	Mu=50.00 As =15.48 As(r)=5.81	Mu=115.00 As =11.36 As(r)=7.12
Vu=-107.00	Vu=42.00	Vu=106.00

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VP-208/3F

B=0.40 H=0.50 L=0.95			B=0.40 H=0.50 L=4.68		
Mu=-0.00 As =18.72 As(r)=5.81	Mu=-38.00 As =18.72 As(r)=5.81	Mu=-101.00 As =18.72 As(r)=6.23	Mu=-270.00 As =18.72 As(r)=17.46	Mu=-54.00 As =11.36 As(r)=5.81	Mu=-215.00 As =18.72 As(r)=13.68
Mu=35.00 As =11.36 As(r)=5.81	Mu=18.00 As =11.36 As(r)=5.81	Mu=20.20 As =11.36 As(r)=5.81	Mu=152.00 As =11.36 As(r)=9.50	Mu=54.00 As =11.36 As(r)=5.81	Mu=170.00 As =11.36 As(r)=10.68
Vu=90.00	Vu=106.00	Vu=121.00	Vu=-156.00	Vu=-91.00	Vu=138.00

B=0.40 H=0.50 L=4.44			B=0.40 H=0.50 L=7.16		
Mu=-243.00 As =18.72 As(r)=15.58	Mu=-48.80 As =22.72 As(r)=5.81	Mu=-244.00 As =18.72 As(r)=15.65	Mu=-252.00 As =18.72 As(r)=16.20	Mu=-50.40 As =22.72 As(r)=5.81	Mu=-247.00 As =18.72 As(r)=15.86
Mu=158.00 As =11.36 As(r)=9.89	Mu=48.80 As =11.36 As(r)=5.81	Mu=164.00 As =21.62 As(r)=10.28	Mu=84.00 As =11.36 As(r)=5.81	Mu=86.50 As =11.36 As(r)=5.81	Mu=82.33 As =11.36 As(r)=5.81
Vu=-149.00	Vu=-87.00	Vu=147.00	Vu=-138.00	Vu=-38.00	Vu=136.00

B=0.40 H=0.50 L=7.77		
Mu=-267.00 As =18.72 As(r)=17.25	Mu=-54.40 As =22.72 As(r)=5.81	Mu=-272.00 As =18.72 As(r)=17.60
Mu=89.00 As =11.36 As(r)=5.81	Mu=94.50 As =11.36 As(r)=5.82	Mu=90.67 As =11.36 As(r)=5.81
Vu=-143.00	Vu=34.00	Vu=143.00

VP-209/3F

B=0.40 H=0.50 L=4.21			B=0.40 H=0.50 L=0.50		
Mu=-73.00 As =7.96 As(r)=5.81	Mu=-54.00 As =7.96 As(r)=5.81	Mu=-154.00 As =11.40 As(r)=9.63	Mu=-1.00 As =11.40 As(r)=5.81	Mu=-0.22 As =11.40 As(r)=5.81	Mu=-0.22 As =8.55 As(r)=5.81
Mu=30.80 As =7.96 As(r)=5.81	Mu=30.80 As =7.96 As(r)=5.81	Mu=51.33 As =7.96 As(r)=5.81	Mu=0.33 As =7.96 As(r)=5.81	Mu=0.22 As =7.96 As(r)=5.81	Mu=0.22 As =5.97 As(r)=5.81
Vu=-51.00	Vu=29.00	Vu=61.00	Vu=-4.00	Vu=-2.00	Vu=0.00

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VP-210/3F

B=0.30 H=0.50 L=1.00			B=0.30 H=0.50 L=9.74		
Mu=-10.00 As =15.88 As(r)=4.36	Mu=-55.00 As =15.88 As(r)=4.36	Mu=-137.00 As =15.88 As(r)=8.64	Mu=-188.00 As =15.88 As(r)=12.08	Mu=-40.40 As =17.04 As(r)=4.36	Mu=-202.00 As =15.88 As(r)=13.06
Mu=25.00 As =11.61 As(r)=4.36	Mu=0.00 As =11.61 As(r)=4.36	Mu=27.40 As =11.61 As(r)=4.36	Mu=62.67 As =11.61 As(r)=4.36	Mu=133.00 As =11.61 As(r)=8.37	Mu=67.33 As =12.07 As(r)=4.36
Vu=103.00	Vu=118.00	Vu=133.00	Vu=-119.00	Vu=21.00	Vu=127.00

B=0.40 H=0.50 L=7.19			B=0.40 H=0.50 L=7.77		
Mu=-192.00 As =18.72 As(r)=12.13	Mu=-38.40 As =22.72 As(r)=5.81	Mu=-177.00 As =18.72 As(r)=11.14	Mu=-254.00 As =18.72 As(r)=16.34	Mu=-50.80 As =22.72 As(r)=5.81	Mu=-239.00 As =18.72 As(r)=15.31
Mu=64.00 As =11.36 As(r)=5.81	Mu=64.00 As =11.61 As(r)=5.81	Mu=59.00 As =15.94 As(r)=5.81	Mu=84.67 As =11.36 As(r)=5.81	Mu=79.67 As =11.61 As(r)=5.81	Mu=79.67 As =11.36 As(r)=5.81
Vu=-111.00	Vu=-23.00	Vu=99.00	Vu=-149.00	Vu=34.00	Vu=132.00

B=0.40 H=0.50 L=4.16			B=0.40 H=0.50 L=0.50		
Mu=-181.00 As =18.72 As(r)=11.40	Mu=-36.20 As =11.36 As(r)=5.81	Mu=-157.00 As =11.36 As(r)=9.83	Mu=-1.00 As =11.36 As(r)=5.81	Mu=-0.22 As =11.36 As(r)=5.81	Mu=-0.22 As =8.52 As(r)=5.81
Mu=137.00 As =11.36 As(r)=8.53	Mu=38.00 As =11.61 As(r)=5.81	Mu=110.00 As =11.36 As(r)=6.80	Mu=0.33 As =11.36 As(r)=5.81	Mu=0.22 As =11.61 As(r)=5.81	Mu=0.22 As =8.52 As(r)=5.81
Vu=-118.00	Vu=68.00	Vu=119.00	Vu=-4.00	Vu=-2.00	Vu=0.00

VP-211/3F

B=0.50 H=0.50 L=0.88			B=0.50 H=0.50 L=4.63		
Mu=-8.00 As =36.06 As(r)=7.26	Mu=-22.00 As =36.06 As(r)=7.26	Mu=-54.00 As =36.06 As(r)=7.26	Mu=-530.00 As =36.06 As(r)=36.03	Mu=-106.00 As =19.35 As(r)=7.26	Mu=-106.00 As =19.35 As(r)=7.26
Mu=23.00 As =25.50 As(r)=7.26	Mu=24.00 As =25.50 As(r)=7.26	Mu=32.00 As =25.50 As(r)=7.26	Mu=176.67 As =25.50 As(r)=11.01	Mu=106.00 As =25.50 As(r)=9.29	Mu=428.00 As =25.50 As(r)=28.30
Vu=53.00	Vu=66.00	Vu=80.00	Vu=-262.00	Vu=-197.00	Vu=-131.00

B=0.50 H=0.50 L=4.39			B=0.40 H=0.50 L=7.11		
Mu=-108.80 As =19.35 As(r)=7.26	Mu=-108.80 As =38.12 As(r)=7.26	Mu=-544.00 As =36.06 As(r)=37.13	Mu=-246.00 As =36.06 As(r)=15.79	Mu=-49.20 As =30.71 As(r)=5.81	Mu=-142.00 As =11.36 As(r)=8.85
Mu=423.00 As =25.50 As(r)=27.94	Mu=108.80 As =25.50 As(r)=8.07	Mu=181.33 As =19.35 As(r)=11.31	Mu=82.00 As =19.35 As(r)=5.81	Mu=60.00 As =25.50 As(r)=5.81	Mu=49.20 As =14.20 As(r)=5.81
Vu=146.00	Vu=208.00	Vu=271.00	Vu=-123.00	Vu=-29.00	Vu=102.00

VP-212/3F

B=0.40 H=0.50 L=0.95			B=0.40 H=0.50 L=4.68		
Mu=-12.20 As =18.72 As(r)=5.81	Mu=-19.00 As =18.72 As(r)=5.81	Mu=-61.00 As =18.72 As(r)=5.81	Mu=-220.00 As =18.72 As(r)=14.02	Mu=-44.00 As =11.36 As(r)=5.81	Mu=-186.00 As =16.27 As(r)=11.74
Mu=20.00 As =11.36 As(r)=5.81	Mu=29.00 As =11.36 As(r)=5.81	Mu=58.00 As =11.36 As(r)=5.81	Mu=131.00 As =11.36 As(r)=8.14	Mu=44.00 As =11.36 As(r)=5.81	Mu=135.00 As =11.36 As(r)=8.40
Vu=-72.00	Vu=71.00	Vu=85.00	Vu=-133.00	Vu=-73.00	Vu=123.00

B=0.40 H=0.50 L=4.44			B=0.40 H=0.50 L=7.16		
Mu=-197.00 As =16.27 As(r)=12.47	Mu=-43.00 As =22.72 As(r)=5.81	Mu=-215.00 As =18.72 As(r)=13.68	Mu=-221.00 As =18.72 As(r)=14.08	Mu=-44.20 As =22.97 As(r)=5.81	Mu=-216.00 As =24.48 As(r)=13.74
Mu=132.00 As =11.36 As(r)=8.21	Mu=43.00 As =11.36 As(r)=5.81	Mu=128.00 As =11.36 As(r)=7.95	Mu=73.67 As =11.36 As(r)=5.81	Mu=73.67 As =11.36 As(r)=5.81	Mu=72.00 As =11.61 As(r)=5.81
Vu=-125.00	Vu=74.00	Vu=131.00	Vu=-123.00	Vu=-32.00	Vu=121.00

B=0.40 H=0.50 L=0.12			B=0.30 H=0.50 L=2.70		
Mu=-271.00 As =24.48 As(r)=17.53	Mu=-251.00 As =24.48 As(r)=16.41	Mu=-232.00 As =24.48 As(r)=15.11	Mu=-232.00 As =21.64 As(r)=15.18	Mu=-46.40 As =16.66 As(r)=4.72	Mu=-46.40 As =11.61 As(r)=4.36
Mu=90.33 As =11.61 As(r)=5.81	Mu=54.20 As =11.36 As(r)=5.81	Mu=77.33 As =11.61 As(r)=5.81	Mu=77.33 As =11.61 As(r)=4.77	Mu=51.00 As =11.36 As(r)=4.36	Mu=124.00 As =11.61 As(r)=7.78
Vu=-175.00	Vu=-173.00	Vu=-170.00	Vu=-143.00	Vu=-115.00	Vu=-86.00

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B=0.40 H=0.50 L=4.49			B=0.40 H=0.50 L=4.16		
Mu=-50.80 As =14.45 As(r)=5.81	Mu=-50.80 As =25.81 As(r)=5.81	Mu=-254.00 As =21.39 As(r)=16.34	Mu=-191.00 As =21.39 As(r)=12.07	Mu=-38.20 As =11.36 As(r)=5.81	Mu=-139.00 As =15.34 As(r)=8.66
Mu=118.00 As =14.45 As(r)=7.31	Mu=78.00 As =11.36 As(r)=5.81	Mu=84.67 As =11.36 As(r)=5.81	Mu=119.00 As =11.36 As(r)=7.37	Mu=38.20 As =11.36 As(r)=5.81	Mu=107.00 As =11.36 As(r)=6.61
Vu=24.00	Vu=80.00	Vu=135.00	Vu=-119.00	Vu=-70.00	Vu=108.00

B=0.40 H=0.50 L=0.50		
Mu=-1.00 As =15.34 As(r)=5.81	Mu=-0.22 As =15.34 As(r)=5.81	Mu=-0.22 As =11.50 As(r)=5.81
Mu=0.33 As =11.36 As(r)=5.81	Mu=0.22 As =11.36 As(r)=5.81	Mu=0.22 As =8.52 As(r)=5.81
Vu=-4.00	Vu=-2.00	Vu=0.00

VS-202/3F

B=0.30 H=0.50 L=3.90		
Mu=-0.00 As =5.97 As(r)=4.36	Mu=-0.00 As =5.97 As(r)=4.36	Mu=-60.00 As =5.97 As(r)=4.36
Mu=21.90 As =5.97 As(r)=4.36	Mu=85.00 As =5.97 As(r)=5.26	Mu=12.00 As =5.97 As(r)=4.36
Vu=-45.00	Vu=32.00	Vu=68.00

VS-203/3F

B=0.20 H=0.50 L=1.71		
Mu=-20.55 As =8.13 As(r)=2.90	Mu=-93.60 As =8.13 As(r)=5.93	Mu=-91.00 As =8.13 As(r)=5.79
Mu=20.00 As =3.98 As(r)=2.90	Mu=18.80 As =3.98 As(r)=2.90	Mu=30.33 As =3.98 As(r)=2.90
Vu=94.45	Vu=19.00	Vu=19.00

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VS-204/3F

B=0.25 H=0.50 L=3.93		
Mu=-80.00 As =5.97 As(r)=4.97	Mu=-22.80 As =3.98 As(r)=3.63	Mu=-0.75 As =3.98 As(r)=3.63
Mu=16.00 As =3.98 As(r)=3.63	Mu=58.50 As =3.98 As(r)=3.70	Mu=34.65 As =3.98 As(r)=3.63
Vu=-46.00	Vu=-10.20	Vu=25.00

VS-205/3F

B=0.30 H=0.50 L=3.77			B=0.30 H=0.50 L=9.20		
Mu=-7.75 As =5.97 As(r)=4.36	Mu=-79.00 As =5.97 As(r)=4.92	Mu=-92.00 As =5.97 As(r)=5.71	Mu=-96.00 As =5.97 As(r)=5.96	Mu=-96.00 As =14.49 As(r)=5.96	Mu=-76.35 As =8.52 As(r)=6.87
Mu=34.90 As =5.97 As(r)=4.36	Mu=52.00 As =5.97 As(r)=4.36	Mu=18.40 As =5.97 As(r)=4.36	Mu=32.00 As =5.97 As(r)=4.36	Mu=93.60 As =10.45 As(r)=6.22	Mu=25.45 As =5.97 As(r)=4.36
Vu=25.80	Vu=37.00	Vu=46.00	Vu=-45.00	Vu=50.00	Vu=-41.15

B=0.30 H=0.50 L=4.40			B=0.30 H=0.50 L=1.00		
Mu=-107.00 As =8.52 As(r)=6.67	Mu=-30.00 As =8.52 As(r)=4.36	Mu=-79.00 As =8.52 As(r)=4.88	Mu=-46.00 As =8.52 As(r)=4.36	Mu=-25.00 As =8.52 As(r)=4.36	Mu=-6.00 As =8.52 As(r)=4.36
Mu=35.67 As =5.97 As(r)=4.36	Mu=21.40 As =5.97 As(r)=4.36	Mu=99.00 As =5.97 As(r)=6.15	Mu=50.00 As =5.97 As(r)=4.36	Mu=29.00 As =5.97 As(r)=4.36	Mu=6.00 As =5.97 As(r)=4.36
Vu=-39.00	Vu=-52.00	Vu=-42.25	Vu=-32.00	Vu=33.00	Vu=36.00

VS-206/3F

B=0.30 H=0.50 L=4.75		
Mu=-67.00 As =5.97 As(r)=4.36	Mu=-15.80 As =5.97 As(r)=4.36	Mu=-79.00 As =5.97 As(r)=4.88
Mu=22.33 As =5.97 As(r)=4.36	Mu=56.00 As =5.97 As(r)=4.36	Mu=26.33 As =5.97 As(r)=4.36
Vu=-78.00	Vu=16.00	Vu=86.00

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VS-207/3F

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=7.84		
Mu=-108.00 As =8.52 As(r)=6.74	Mu=-36.60 As =17.04 As(r)=4.36	Mu=-183.00 As =13.43 As(r)=11.74	Mu=-190.00 As =13.43 As(r)=12.22	Mu=-38.00 As =17.04 As(r)=4.36	Mu=-103.00 As =8.52 As(r)=6.41
Mu=36.60 As =8.52 As(r)=4.36	Mu=84.00 As =8.52 As(r)=5.19	Mu=61.00 As =8.52 As(r)=4.36	Mu=63.33 As =8.52 As(r)=4.36	Mu=117.00 As =8.52 As(r)=7.32	Mu=38.00 As =8.52 As(r)=4.36
Vu=-99.00	Vu=18.00	Vu=121.00	Vu=-130.00	Vu=-18.00	Vu=105.00

VS-208/3F

B=0.25 H=0.50 L=1.55		
Mu=-50.00 As =3.98 As(r)=3.63	Mu=-20.00 As =3.98 As(r)=3.63	Mu=-8.00 As =3.98 As(r)=3.63
Mu=10.00 As =3.98 As(r)=3.63	Mu=1.00 As =3.98 As(r)=3.63	Mu=10.00 As =3.98 As(r)=3.63
Vu=-42.00	Vu=-31.00	Vu=-20.00

VS-209/3F

B=0.42 H=0.50 L=1.00			B=0.30 H=0.50 L=4.75		
Mu=-14.00 As =7.96 As(r)=6.10	Mu=-11.00 As =7.96 As(r)=6.10	Mu=-32.00 As =7.96 As(r)=6.10	Mu=-46.00 As =5.97 As(r)=4.36	Mu=-11.80 As =5.97 As(r)=4.36	Mu=-59.00 As =5.97 As(r)=4.36
Mu=6.40 As =7.96 As(r)=6.10	Mu=6.40 As =7.96 As(r)=6.10	Mu=10.67 As =7.96 As(r)=6.10	Mu=15.33 As =5.97 As(r)=4.36	Mu=53.00 As =5.97 As(r)=4.36	Mu=19.67 As =5.97 As(r)=4.36
Vu=-25.00	Vu=25.00	Vu=37.00	Vu=-68.00	Vu=9.00	Vu=79.00

B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-69.00 As =5.97 As(r)=4.36	Mu=-22.20 As =14.49 As(r)=4.36	Mu=-111.00 As =8.52 As(r)=6.93	Mu=-106.00 As =8.52 As(r)=6.61	Mu=-32.00 As =17.04 As(r)=4.36	Mu=-160.00 As =13.43 As(r)=10.17
Mu=23.00 As =5.97 As(r)=4.36	Mu=22.20 As =5.97 As(r)=4.36	Mu=37.00 As =11.44 As(r)=4.36	Mu=35.33 As =5.97 As(r)=4.36	Mu=77.00 As =5.97 As(r)=4.75	Mu=53.33 As =8.52 As(r)=4.36
Vu=-69.00	Vu=16.30	Vu=80.00	Vu=-102.00	Vu=9.00	Vu=116.00

B=0.30 H=0.50 L=7.84		
Mu=-174.00 As =13.43 As(r)=11.12	Mu=-34.80 As =14.49 As(r)=4.36	Mu=-74.00 As =5.97 As(r)=4.56
Mu=58.00 As =8.52 As(r)=4.36	Mu=127.00 As =5.97 As(r)=7.98	Mu=34.80 As =8.52 As(r)=4.36
Vu=-131.00	Vu=-16.00	Vu=104.00

VS-210/3F

B=0.30 H=0.50 L=1.00			B=0.30 H=0.50 L=4.75		
Mu=-18.00 As =5.97 As(r)=4.36	Mu=-19.00 As =5.97 As(r)=4.36	Mu=-59.00 As =5.97 As(r)=4.36	Mu=-80.00 As =5.97 As(r)=4.94	Mu=-16.00 As =5.97 As(r)=4.36	Mu=-79.00 As =5.97 As(r)=4.88
Mu=11.80 As =8.52 As(r)=4.36	Mu=11.80 As =8.52 As(r)=4.36	Mu=22.00 As =8.52 As(r)=4.36	Mu=26.67 As =8.52 As(r)=4.36	Mu=52.00 As =8.52 As(r)=4.36	Mu=26.33 As =8.52 As(r)=4.36
Vu=-42.00	Vu=50.00	Vu=68.00	Vu=-78.00	Vu=16.00	Vu=84.00

B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-72.00 As =5.97 As(r)=4.43	Mu=-21.60 As =14.49 As(r)=4.36	Mu=-108.00 As =13.43 As(r)=6.74	Mu=-123.00 As =13.43 As(r)=7.71	Mu=-33.20 As =17.04 As(r)=4.36	Mu=-166.00 As =13.43 As(r)=10.58
Mu=24.00 As =8.52 As(r)=4.36	Mu=21.60 As =8.52 As(r)=4.36	Mu=36.00 As =8.52 As(r)=4.36	Mu=41.00 As =8.52 As(r)=4.36	Mu=76.00 As =8.52 As(r)=4.69	Mu=55.33 As =8.52 As(r)=4.36
Vu=-67.00	Vu=15.00	Vu=80.00	Vu=-104.00	Vu=11.00	Vu=116.00

B=0.30 H=0.50 L=7.84		
Mu=-187.00 As =13.43 As(r)=12.02	Mu=-37.40 As =17.04 As(r)=4.36	Mu=-99.00 As =8.52 As(r)=6.15
Mu=62.33 As =8.52 As(r)=4.36	Mu=120.00 As =8.52 As(r)=7.52	Mu=37.40 As =8.52 As(r)=4.36
Vu=-131.00	Vu=-18.00	Vu=106.00

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VS-210(1)/3F

B=0.30 H=0.50 L=1.00			B=0.30 H=0.50 L=4.75		
Mu=-27.00 As =5.97 As(r)=4.36	Mu=-20.00 As =5.97 As(r)=4.36	Mu=-29.00 As =5.97 As(r)=4.36	Mu=-81.00 As =5.97 As(r)=5.00	Mu=-17.84 As =5.97 As(r)=4.36	Mu=-17.84 As =5.97 As(r)=4.36
Mu=5.80 As =8.52 As(r)=4.36	Mu=5.80 As =8.52 As(r)=4.36	Mu=9.67 As =8.52 As(r)=4.36	Mu=27.00 As =8.52 As(r)=4.36	Mu=84.00 As =8.52 As(r)=5.30	Mu=44.00 As =8.52 As(r)=4.36
Vu=-31.00	Vu=-14.00	Vu=24.00	Vu=-94.00	Vu=-23.00	Vu=53.00

B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-26.20 As =5.97 As(r)=4.36	Mu=-26.20 As =14.49 As(r)=4.36	Mu=-131.00 As =13.43 As(r)=8.24	Mu=-116.00 As =13.43 As(r)=7.26	Mu=-35.20 As =17.04 As(r)=4.36	Mu=-176.00 As =13.43 As(r)=11.26
Mu=39.00 As =8.52 As(r)=4.36	Mu=43.67 As =8.52 As(r)=4.36	Mu=43.67 As =8.52 As(r)=4.36	Mu=38.67 As =8.52 As(r)=4.36	Mu=64.00 As =8.52 As(r)=4.36	Mu=58.67 As =8.52 As(r)=4.36
Vu=-37.00	Vu=33.00	Vu=104.00	Vu=-101.00	Vu=10.00	Vu=116.00

B=0.30 H=0.50 L=7.85		
Mu=-124.00 As =13.43 As(r)=7.78	Mu=-24.80 As =17.04 As(r)=4.36	Mu=-107.00 As =8.52 As(r)=6.67
Mu=41.33 As =8.52 As(r)=4.36	Mu=99.00 As =8.52 As(r)=6.15	Mu=35.67 As =8.52 As(r)=4.36
Vu=-106.00	Vu=-5.00	Vu=106.00

VS-210(2)/3F

B=0.30 H=0.50 L=1.00			B=0.30 H=0.50 L=4.75		
Mu=-13.60 As =5.97 As(r)=4.36	Mu=-19.00 As =5.97 As(r)=4.36	Mu=-68.00 As =5.97 As(r)=4.36	Mu=-70.00 As =5.97 As(r)=4.36	Mu=-14.00 As =5.97 As(r)=4.36	Mu=-67.00 As =5.97 As(r)=4.36
Mu=17.00 As =8.52 As(r)=4.36	Mu=13.60 As =8.52 As(r)=4.36	Mu=22.67 As =8.52 As(r)=4.36	Mu=23.33 As =8.52 As(r)=4.36	Mu=57.00 As =8.52 As(r)=4.36	Mu=22.33 As =8.52 As(r)=4.36
Vu=44.00	Vu=62.00	Vu=79.00	Vu=-76.00	Vu=13.00	Vu=81.00

B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-63.00 As =5.97 As(r)=4.36	Mu=-18.60 As =14.49 As(r)=4.36	Mu=-93.00 As =13.43 As(r)=5.77	Mu=-120.00 As =13.43 As(r)=7.52	Mu=-34.00 As =17.04 As(r)=4.36	Mu=-170.00 As =13.43 As(r)=10.85
Mu=23.00 As =8.52 As(r)=4.36	Mu=23.00 As =8.52 As(r)=4.36	Mu=31.00 As =8.52 As(r)=4.36	Mu=40.00 As =8.52 As(r)=4.36	Mu=73.00 As =8.52 As(r)=4.50	Mu=56.67 As =8.52 As(r)=4.36
Vu=-67.00	Vu=13.00	Vu=78.00	Vu=-103.00	Vu=11.00	Vu=117.00

B=0.30 H=0.50 L=7.84		
Mu=-189.00 As =13.43 As(r)=12.15	Mu=-37.80 As =17.04 As(r)=4.36	Mu=-100.00 As =8.52 As(r)=6.22
Mu=63.00 As =8.52 As(r)=4.36	Mu=114.00 As =8.52 As(r)=7.13	Mu=37.80 As =8.52 As(r)=4.36
Vu=-131.00	Vu=-16.00	Vu=107.00

VS-210(3)/3F

B=0.30 H=0.50 L=1.00			B=0.30 H=0.50 L=4.75		
Mu=-24.00 As =5.97 As(r)=4.36	Mu=-5.00 As =5.97 As(r)=4.36	Mu=-4.80 As =5.97 As(r)=4.36	Mu=-41.00 As =5.97 As(r)=4.36	Mu=-14.80 As =5.97 As(r)=4.36	Mu=-20.00 As =5.97 As(r)=4.36
Mu=4.80 As =8.52 As(r)=4.36	Mu=5.00 As =8.52 As(r)=4.36	Mu=11.00 As =8.52 As(r)=4.36	Mu=14.80 As =8.52 As(r)=4.36	Mu=74.00 As =8.52 As(r)=4.56	Mu=14.80 As =8.52 As(r)=4.36
Vu=-38.00	Vu=-21.00	Vu=4.00	Vu=-76.00	Vu=-5.00	Vu=72.00

B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-27.00 As =5.97 As(r)=4.36	Mu=-17.80 As =14.49 As(r)=4.36	Mu=-89.00 As =13.43 As(r)=5.51	Mu=-103.00 As =13.43 As(r)=6.41	Mu=-35.40 As =17.04 As(r)=4.36	Mu=-177.00 As =13.43 As(r)=11.33
Mu=17.80 As =8.52 As(r)=4.36	Mu=31.00 As =8.52 As(r)=4.36	Mu=29.67 As =8.52 As(r)=4.36	Mu=35.40 As =8.52 As(r)=4.36	Mu=70.00 As =8.52 As(r)=4.36	Mu=59.00 As =8.52 As(r)=4.36
Vu=-58.00	Vu=13.00	Vu=83.00	Vu=-99.00	Vu=10.00	Vu=118.00

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B=0.30 H=0.50 L=7.84		
Mu=-181.00 As =13.43 As(r)=11.60	Mu=-36.20 As =17.04 As(r)=4.36	Mu=-82.00 As =8.52 As(r)=5.07
Mu=60.33 As =8.52 As(r)=4.36	Mu=113.00 As =8.52 As(r)=7.06	Mu=36.20 As =8.52 As(r)=4.36
Vu=-129.00	Vu=-13.00	Vu=106.00

VS-213/3F

B=0.20 H=0.50 L=0.45		
Mu=-81.00 As =5.68 As(r)=5.08	Mu=-38.00 As =5.68 As(r)=2.90	Mu=-5.00 As =5.68 As(r)=2.90
Mu=16.20 As =3.98 As(r)=2.90	Mu=0.00 As =3.98 As(r)=2.90	Mu=4.00 As =3.98 As(r)=2.90
Vu=-111.00	Vu=-106.00	Vu=-101.00

VS-214/3F

B=0.30 H=0.50 L=4.21		
Mu=-84.00 As =5.97 As(r)=5.19	Mu=-16.80 As =5.97 As(r)=4.36	Mu=-48.00 As =5.97 As(r)=4.36
Mu=28.00 As =5.97 As(r)=4.36	Mu=27.30 As =5.97 As(r)=4.36	Mu=16.80 As =5.97 As(r)=4.36
Vu=-69.00	Vu=-19.00	Vu=50.00

VS-215/3F

B=0.30 H=0.50 L=7.84			B=0.30 H=0.50 L=4.21		
Mu=-188.00 As =15.88 As(r)=12.08	Mu=-37.60 As =17.04 As(r)=4.36	Mu=-159.00 As =13.43 As(r)=10.11	Mu=-118.00 As =13.43 As(r)=7.39	Mu=-23.60 As =8.52 As(r)=4.36	Mu=-23.60 As =8.52 As(r)=4.36
Mu=62.67 As =8.52 As(r)=4.36	Mu=121.30 As =8.52 As(r)=8.77	Mu=53.00 As =8.52 As(r)=4.36	Mu=39.33 As =8.52 As(r)=4.36	Mu=28.90 As =8.52 As(r)=4.36	Mu=23.60 As =8.52 As(r)=4.36
Vu=-141.00	Vu=17.70	Vu=126.00	Vu=-87.00	Vu=-27.00	Vu=46.00

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VS-216/3F

B=0.30 H=0.50 L=1.00			B=0.30 H=0.50 L=4.75		
Mu=-9.00 As =10.88 As(r)=4.36	Mu=-36.00 As =10.88 As(r)=4.36	Mu=-78.00 As =10.88 As(r)=4.81	Mu=-151.00 As =10.88 As(r)=9.57	Mu=-30.20 As =5.97 As(r)=4.36	Mu=-30.20 As =5.97 As(r)=4.36
Mu=0.00 As =5.97 As(r)=4.36	Mu=0.00 As =5.97 As(r)=4.36	Mu=15.60 As =5.97 As(r)=4.36	Mu=50.33 As =5.97 As(r)=4.36	Mu=70.00 As =5.97 As(r)=4.36	Mu=39.00 As =5.97 As(r)=4.36
Vu=31.00	Vu=51.00	Vu=71.00	Vu=-114.00	Vu=-36.00	Vu=73.00

B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-35.80 As =5.97 As(r)=4.36	Mu=-35.80 As =11.94 As(r)=4.36	Mu=-179.00 As =13.33 As(r)=11.47	Mu=-198.00 As =13.33 As(r)=12.78	Mu=-39.60 As =5.97 As(r)=4.36	Mu=-139.00 As =9.41 As(r)=8.77
Mu=59.10 As =5.97 As(r)=4.36	Mu=35.80 As =5.97 As(r)=4.36	Mu=59.67 As =5.97 As(r)=4.36	Mu=66.00 As =5.97 As(r)=4.36	Mu=85.00 As =5.97 As(r)=5.26	Mu=46.33 As =5.97 As(r)=4.36
Vu=-48.00	Vu=43.00	Vu=119.00	Vu=-133.00	Vu=-15.00	Vu=117.00

B=0.30 H=0.50 L=0.14		
Mu=-37.00 As =9.41 As(r)=4.36	Mu=-21.00 As =9.41 As(r)=4.36	Mu=-7.00 As =9.41 As(r)=4.36
Mu=7.40 As =5.97 As(r)=4.36	Mu=0.00 As =5.97 As(r)=4.36	Mu=0.00 As =5.97 As(r)=4.36
Vu=-71.00	Vu=-65.00	Vu=-58.00

VS-217/3F

B=0.30 H=0.50 L=4.55			B=0.30 H=0.50 L=4.21		
Mu=-0.00 As =5.97 As(r)=4.36	Mu=-0.00 As =11.94 As(r)=4.36	Mu=-121.00 As =9.41 As(r)=7.58	Mu=-105.00 As =9.41 As(r)=6.54	Mu=-21.00 As =5.97 As(r)=4.36	Mu=-23.00 As =5.97 As(r)=4.36
Mu=29.00 As =5.97 As(r)=4.36	Mu=48.00 As =5.97 As(r)=4.36	Mu=24.20 As =5.97 As(r)=4.36	Mu=35.00 As =8.46 As(r)=4.36	Mu=29.00 As =5.97 As(r)=4.36	Mu=21.00 As =5.97 As(r)=4.36
Vu=-42.00	Vu=29.00	Vu=100.00	Vu=-85.00	Vu=-23.00	Vu=50.00

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VS-218/3F

B=0.30 H=0.50 L=1.00			B=0.30 H=0.50 L=4.75		
Mu=-10.00 As =5.97 As(r)=4.36	Mu=-16.00 As =5.97 As(r)=4.36	Mu=-46.00 As =5.97 As(r)=4.36	Mu=-65.00 As =5.97 As(r)=4.36	Mu=-13.00 As =5.97 As(r)=4.36	Mu=-59.00 As =5.97 As(r)=4.36
Mu=15.00 As =5.97 As(r)=4.36	Mu=10.00 As =5.97 As(r)=4.36	Mu=21.00 As =5.97 As(r)=4.36	Mu=37.00 As =5.97 As(r)=4.36	Mu=25.00 As =5.97 As(r)=4.36	Mu=19.67 As =5.97 As(r)=4.36
Vu=36.00	Vu=44.00	Vu=52.00	Vu=-43.00	Vu=18.00	Vu=47.00

B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-52.00 As =5.97 As(r)=4.36	Mu=-11.60 As =11.94 As(r)=4.36	Mu=-58.00 As =5.97 As(r)=4.36	Mu=-71.00 As =5.97 As(r)=4.37	Mu=-17.80 As =11.94 As(r)=4.36	Mu=-89.00 As =5.97 As(r)=5.51
Mu=17.33 As =5.97 As(r)=4.36	Mu=11.60 As =5.97 As(r)=4.36	Mu=19.33 As =5.97 As(r)=4.36	Mu=23.67 As =5.97 As(r)=4.36	Mu=33.00 As =5.97 As(r)=4.36	Mu=29.67 As =5.97 As(r)=4.36
Vu=-38.00	Vu=11.00	Vu=39.00	Vu=-48.00	Vu=9.00	Vu=53.00

B=0.30 H=0.50 L=7.84			B=0.30 H=0.50 L=4.21		
Mu=-92.00 As =5.97 As(r)=5.71	Mu=-18.40 As =11.94 As(r)=4.36	Mu=-74.00 As =5.97 As(r)=4.56	Mu=-62.00 As =5.97 As(r)=4.36	Mu=-12.40 As =5.97 As(r)=4.36	Mu=-22.00 As =5.97 As(r)=4.36
Mu=30.67 As =5.97 As(r)=4.36	Mu=41.00 As =9.45 As(r)=4.36	Mu=24.67 As =5.97 As(r)=4.36	Mu=20.67 As =5.97 As(r)=4.36	Mu=12.40 As =5.97 As(r)=4.36	Mu=18.30 As =5.97 As(r)=4.36
Vu=-55.00	Vu=-7.00	Vu=51.00	Vu=-43.00	Vu=-17.00	Vu=28.00

B=0.30 H=0.50 L=0.50		
Mu=-2.00 As =5.97 As(r)=4.36	Mu=-0.00 As =5.97 As(r)=4.36	Mu=-0.00 As =4.48 As(r)=4.36
Mu=0.40 As =5.97 As(r)=4.36	Mu=0.00 As =5.97 As(r)=4.36	Mu=0.00 As =4.48 As(r)=4.36
Vu=-4.00	Vu=-2.00	Vu=0.00

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VP-301/4F

B=0.45 H=0.50 L=7.78			B=0.45 H=0.50 L=7.80		
Mu=-399.00 As =28.85 As(r)=26.49	Mu=-79.80 As =30.96 As(r)=6.53	Mu=-397.00 As =28.85 As(r)=26.34	Mu=-391.00 As =28.85 As(r)=25.90	Mu=-78.20 As =29.50 As(r)=6.53	Mu=-384.00 As =28.85 As(r)=25.39
Mu=133.00 As =15.48 As(r)=8.24	Mu=169.00 As =15.48 As(r)=10.56	Mu=132.33 As =15.48 As(r)=8.20	Mu=130.33 As =15.48 As(r)=8.07	Mu=165.00 As =15.48 As(r)=10.30	Mu=128.00 As =15.48 As(r)=7.92
Vu=-207.00	Vu=-86.65	Vu=205.00	Vu=-202.00	Vu=84.20	Vu=199.00

B=0.45 H=0.50 L=5.70		
Mu=-307.00 As =28.85 As(r)=19.87	Mu=-64.00 As =35.33 As(r)=6.53	Mu=-320.00 As =25.51 As(r)=20.78
Mu=102.33 As =16.16 As(r)=6.53	Mu=117.00 As =15.48 As(r)=7.22	Mu=106.67 As =15.48 As(r)=6.57
Vu=-186.00	Vu=70.15	Vu=170.00

VP-302/4F

B=0.55 H=0.50 L=7.84			B=0.55 H=0.50 L=7.80		
Mu=-698.00 As =47.52 As(r)=48.96	Mu=-139.60 As =51.00 As(r)=8.61	Mu=-697.00 As =47.52 As(r)=48.87	Mu=-705.00 As =47.52 As(r)=49.55	Mu=-141.00 As =45.99 As(r)=8.70	Mu=-661.00 As =47.52 As(r)=45.88
Mu=232.67 As =25.50 As(r)=14.61	Mu=376.00 As =25.50 As(r)=24.33	Mu=232.33 As =25.50 As(r)=14.60	Mu=235.00 As =25.50 As(r)=14.77	Mu=366.00 As =25.50 As(r)=23.64	Mu=220.33 As =25.50 As(r)=14.18
Vu=-406.00	Vu=150.60	Vu=403.00	Vu=-400.00	Vu=160.15	Vu=428.00

B=0.55 H=0.50 L=5.70		
Mu=-447.00 As =47.52 As(r)=29.40	Mu=-89.40 As =49.90 As(r)=7.99	Mu=-410.00 As =29.38 As(r)=26.74
Mu=149.00 As =28.03 As(r)=9.21	Mu=157.00 As =25.50 As(r)=9.71	Mu=136.67 As =19.35 As(r)=8.42
Vu=-334.00	Vu=-81.00	Vu=233.00

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VP-303/4F

B=0.50 H=0.50 L=7.89			B=0.50 H=0.50 L=9.15		
Mu=-532.00 As =36.06 As(r)=36.19	Mu=-114.00 As =44.85 As(r)=7.26	Mu=-570.00 As =47.52 As(r)=39.20	Mu=-729.00 As =47.52 As(r)=52.76	Mu=-145.80 As =36.10 As(r)=9.03	Mu=-700.00 As =47.52 As(r)=50.16
Mu=177.33 As =19.35 As(r)=11.05	Mu=285.00 As =19.35 As(r)=18.20	Mu=190.00 As =25.50 As(r)=11.88	Mu=243.00 As =25.50 As(r)=15.37	Mu=337.40 As =19.35 As(r)=22.42	Mu=233.33 As =38.64 As(r)=14.72
Vu=-284.00	Vu=122.60	Vu=316.00	Vu=-367.00	Vu=51.00	Vu=464.00

B=0.50 H=0.50 L=4.35		
Mu=-378.00 As =44.42 As(r)=24.68	Mu=-76.80 As =41.91 As(r)=7.26	Mu=-384.00 As =32.72 As(r)=25.11
Mu=126.00 As =19.35 As(r)=7.77	Mu=131.00 As =19.35 As(r)=8.09	Mu=137.00 As =19.35 As(r)=8.47
Vu=-242.00	Vu=-226.00	Vu=227.00

VP-304/4F

B=0.50 H=0.50 L=7.93			B=0.50 H=0.50 L=9.15		
Mu=-474.00 As =36.06 As(r)=31.73	Mu=-98.60 As =44.85 As(r)=7.26	Mu=-493.00 As =47.52 As(r)=33.17	Mu=-688.00 As =47.52 As(r)=49.10	Mu=-137.60 As =28.54 As(r)=8.51	Mu=-361.00 As =32.72 As(r)=23.47
Mu=158.00 As =19.35 As(r)=9.81	Mu=228.00 As =19.35 As(r)=14.37	Mu=164.33 As =19.35 As(r)=10.22	Mu=229.33 As =22.11 As(r)=14.46	Mu=250.00 As =19.35 As(r)=16.10	Mu=137.60 As =25.50 As(r)=9.66
Vu=-239.00	Vu=109.60	Vu=263.00	Vu=-313.00	Vu=-36.40	Vu=186.00

B=0.50 H=0.50 L=4.35		
Mu=-135.40 As =32.72 As(r)=8.37	Mu=-135.40 As =54.66 As(r)=8.37	Mu=-677.00 As =47.52 As(r)=48.14
Mu=518.00 As =33.77 As(r)=35.10	Mu=135.40 As =19.35 As(r)=8.37	Mu=225.67 As =25.50 As(r)=14.22
Vu=220.60	Vu=335.00	Vu=350.00

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VP-305/4F

B=0.45 H=0.50 L=7.96			B=0.45 H=0.50 L=9.15		
Mu=-392.00 As =28.85 As(r)=25.97	Mu=-78.40 As =35.88 As(r)=6.53	Mu=-391.00 As =38.02 As(r)=25.90	Mu=-515.00 As =38.02 As(r)=35.44	Mu=-105.20 As =26.62 As(r)=6.53	Mu=-526.00 As =38.02 As(r)=36.33
Mu=130.67 As =15.48 As(r)=8.09	Mu=157.00 As =15.48 As(r)=9.78	Mu=130.33 As =15.48 As(r)=8.07	Mu=171.67 As =15.48 As(r)=10.73	Mu=179.00 As =15.48 As(r)=11.28	Mu=175.33 As =28.31 As(r)=10.97
Vu=-182.00	Vu=-94.20	Vu=213.00	Vu=-264.00	Vu=27.00	Vu=367.00

B=0.45 H=0.50 L=4.35		
Mu=-350.00 As =38.02 As(r)=22.92	Mu=-70.00 As =20.57 As(r)=6.53	Mu=-323.00 As =25.51 As(r)=20.99
Mu=153.00 As =15.48 As(r)=9.52	Mu=105.00 As =15.48 As(r)=6.53	Mu=188.00 As =15.48 As(r)=11.80
Vu=-216.00	Vu=-202.00	Vu=186.00

VP-306/4F

B=0.40 H=0.50 L=4.68			B=0.40 H=0.50 L=1.52		
Mu=-239.00 As =18.72 As(r)=15.31	Mu=-47.80 As =11.36 As(r)=5.81	Mu=-207.00 As =18.72 As(r)=13.14	Mu=-221.00 As =18.72 As(r)=14.08	Mu=-121.00 As =18.72 As(r)=8.75	Mu=-44.20 As =14.56 As(r)=5.81
Mu=173.00 As =15.48 As(r)=10.88	Mu=47.80 As =15.48 As(r)=5.81	Mu=173.00 As =15.48 As(r)=10.88	Mu=150.00 As =15.48 As(r)=9.37	Mu=109.00 As =15.48 As(r)=7.27	Mu=73.00 As =15.48 As(r)=5.81
Vu=-126.00	Vu=-85.00	Vu=118.00	Vu=-122.00	Vu=-117.00	Vu=-112.00

B=0.30 H=0.50 L=2.67			B=0.40 H=0.50 L=7.16		
Mu=-41.20 As =8.52 As(r)=4.36	Mu=-50.00 As =24.40 As(r)=4.75	Mu=-206.00 As =15.88 As(r)=13.34	Mu=-199.00 As =18.72 As(r)=12.60	Mu=-41.60 As =22.72 As(r)=5.81	Mu=-208.00 As =18.72 As(r)=13.21
Mu=79.00 As =11.61 As(r)=4.88	Mu=60.00 As =15.48 As(r)=4.51	Mu=132.00 As =11.61 As(r)=8.31	Mu=87.00 As =13.60 As(r)=5.81	Mu=41.60 As =15.48 As(r)=5.81	Mu=85.00 As =11.53 As(r)=5.81
Vu=83.00	Vu=100.00	Vu=122.00	Vu=-96.00	Vu=38.00	Vu=98.00

B=0.40 H=0.50 L=7.77		
Mu=-197.00 As =18.72 As(r)=12.47	Mu=-45.00 As =22.72 As(r)=5.81	Mu=-225.00 As =18.72 As(r)=14.35
Mu=82.00 As =11.36 As(r)=5.81	Mu=78.10 As =15.48 As(r)=5.81	Mu=75.00 As =11.36 As(r)=5.81
Vu=-95.00	Vu=36.00	Vu=101.00

VP-307/4F

B=0.40 H=0.50 L=4.68			B=0.40 H=0.50 L=4.44		
Mu=-237.00 As =16.27 As(r)=15.17	Mu=-47.40 As =15.32 As(r)=5.81	Mu=-163.00 As =27.63 As(r)=10.22	Mu=-198.00 As =16.27 As(r)=12.53	Mu=-39.80 As =11.36 As(r)=5.81	Mu=-199.00 As =16.27 As(r)=12.60
Mu=103.00 As =11.36 As(r)=6.35	Mu=47.40 As =11.36 As(r)=5.81	Mu=133.00 As =11.36 As(r)=8.27	Mu=114.00 As =11.36 As(r)=7.05	Mu=39.80 As =11.36 As(r)=5.81	Mu=118.00 As =11.36 As(r)=7.31
Vu=-142.00	Vu=-77.00	Vu=116.00	Vu=-129.00	Vu=-67.00	Vu=128.00

B=0.40 H=0.50 L=7.16			B=0.40 H=0.50 L=7.77		
Mu=-219.00 As =16.27 As(r)=13.95	Mu=-45.00 As =22.72 As(r)=5.81	Mu=-225.00 As =16.27 As(r)=14.35	Mu=-225.00 As =16.27 As(r)=14.35	Mu=-50.20 As =21.97 As(r)=5.81	Mu=-251.00 As =18.72 As(r)=16.14
Mu=73.00 As =11.36 As(r)=5.81	Mu=75.70 As =11.36 As(r)=5.81	Mu=75.00 As =11.36 As(r)=5.81	Mu=75.00 As =11.36 As(r)=5.81	Mu=86.90 As =11.36 As(r)=5.81	Mu=83.67 As =11.36 As(r)=5.81
Vu=-128.00	Vu=29.00	Vu=129.00	Vu=-133.00	Vu=29.00	Vu=138.00

VP-308/4F

B=0.30 H=0.50 L=9.74			B=0.40 H=0.50 L=7.19		
Mu=-172.00 As =16.27 As(r)=10.99	Mu=-35.40 As =22.72 As(r)=4.36	Mu=-177.00 As =16.27 As(r)=11.33	Mu=-157.00 As =16.27 As(r)=9.83	Mu=-36.20 As =22.72 As(r)=5.81	Mu=-181.00 As =16.27 As(r)=11.40
Mu=57.33 As =11.36 As(r)=4.36	Mu=116.00 As =11.36 As(r)=7.26	Mu=59.00 As =11.36 As(r)=4.36	Mu=52.33 As =11.36 As(r)=5.81	Mu=55.00 As =11.36 As(r)=5.81	Mu=60.33 As =11.36 As(r)=5.81
Vu=-113.00	Vu=25.00	Vu=116.00	Vu=-101.00	Vu=13.00	Vu=100.00

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B=0.40 H=0.50 L=7.77		
Mu=-228.00 As =16.27 As(r)=14.56	Mu=-45.60 As =22.72 As(r)=5.81	Mu=-224.00 As =16.27 As(r)=14.29
Mu=76.00 As =11.36 As(r)=5.81	Mu=87.00 As =11.36 As(r)=5.81	Mu=74.67 As =11.36 As(r)=5.81
Vu=-144.00	Vu=31.00	Vu=129.00

VP-309/4F

B=0.50 H=0.50 L=4.72			B=0.50 H=0.50 L=4.49		
Mu=-555.00 As =36.06 As(r)=38.00	Mu=-111.00 As =36.06 As(r)=7.26	Mu=-111.00 As =19.35 As(r)=7.26	Mu=-105.40 As =19.35 As(r)=7.26	Mu=-105.40 As =32.97 As(r)=7.26	Mu=-527.00 As =36.22 As(r)=35.80
Mu=185.00 As =19.35 As(r)=11.55	Mu=111.00 As =19.35 As(r)=8.66	Mu=484.00 As =36.97 As(r)=32.49	Mu=461.00 As =36.97 As(r)=30.75	Mu=105.40 As =19.35 As(r)=7.94	Mu=175.67 As =14.20 As(r)=10.95
Vu=-283.00	Vu=-220.00	Vu=-157.00	Vu=160.00	Vu=220.00	Vu=280.00

B=0.40 H=0.50 L=7.21		
Mu=-203.00 As =36.22 As(r)=12.87	Mu=-40.60 As =14.20 As(r)=5.81	Mu=-144.00 As =14.20 As(r)=8.98
Mu=67.67 As =14.20 As(r)=5.81	Mu=58.00 As =36.97 As(r)=5.81	Mu=58.00 As =14.20 As(r)=5.81
Vu=-113.00	Vu=-18.00	Vu=101.00

VP-310/4F

B=0.40 H=0.50 L=4.68			B=0.40 H=0.50 L=4.44		
Mu=-198.00 As =14.20 As(r)=12.53	Mu=-39.60 As =11.36 As(r)=5.81	Mu=-136.00 As =14.20 As(r)=8.46	Mu=-165.00 As =14.20 As(r)=10.35	Mu=-33.40 As =22.72 As(r)=5.81	Mu=-167.00 As =14.20 As(r)=10.48
Mu=78.00 As =11.36 As(r)=5.81	Mu=39.60 As =11.36 As(r)=5.81	Mu=106.00 As =11.36 As(r)=6.55	Mu=92.00 As =11.36 As(r)=5.81	Mu=33.40 As =11.36 As(r)=5.81	Mu=95.00 As =11.36 As(r)=5.85
Vu=-123.00	Vu=-63.00	Vu=100.00	Vu=-111.00	Vu=54.00	Vu=111.00

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B=0.40 H=0.50 L=7.16			B=0.40 H=0.50 L=0.12		
Mu=-202.00 As =14.20 As(r)=12.80	Mu=-40.40 As =22.72 As(r)=5.81	Mu=-189.00 As =18.72 As(r)=11.93	Mu=-270.00 As =18.72 As(r)=17.46	Mu=-250.00 As =18.72 As(r)=16.34	Mu=-230.00 As =18.72 As(r)=14.97
Mu=67.33 As =11.36 As(r)=5.81	Mu=59.90 As =11.36 As(r)=5.81	Mu=67.20 As =10.51 As(r)=5.81	Mu=90.00 As =10.51 As(r)=5.81	Mu=54.00 As =11.36 As(r)=5.81	Mu=76.67 As =10.51 As(r)=5.81
Vu=-117.00	Vu=-26.00	Vu=113.00	Vu=-179.00	Vu=-176.00	Vu=-174.00

B=0.30 H=0.50 L=2.70			B=0.40 H=0.50 L=4.49		
Mu=-230.00 As =15.88 As(r)=15.04	Mu=-46.00 As =23.89 As(r)=4.36	Mu=-46.00 As =8.52 As(r)=4.36	Mu=-47.40 As =11.36 As(r)=5.81	Mu=-47.40 As =11.36 As(r)=5.81	Mu=-237.00 As =18.72 As(r)=15.17
Mu=76.67 As =10.01 As(r)=4.73	Mu=46.00 As =11.36 As(r)=4.36	Mu=135.00 As =8.52 As(r)=8.50	Mu=125.00 As =13.95 As(r)=7.76	Mu=86.00 As =11.36 As(r)=5.99	Mu=79.00 As =10.51 As(r)=5.81
Vu=-148.00	Vu=-119.00	Vu=-91.00	Vu=21.00	Vu=77.00	Vu=132.00

VS-302/4F

B=0.30 H=0.50 L=3.90		
Mu=-0.00 As =5.97 As(r)=4.36	Mu=-0.00 As =5.97 As(r)=4.36	Mu=-63.00 As =5.97 As(r)=4.36
Mu=20.35 As =5.97 As(r)=4.36	Mu=90.00 As =5.97 As(r)=5.58	Mu=12.60 As =5.97 As(r)=4.36
Vu=-47.00	Vu=40.00	Vu=76.00

VS-303/4F

B=0.20 H=0.50 L=1.71		
Mu=-17.42 As =5.68 As(r)=2.90	Mu=-86.00 As =5.68 As(r)=5.41	Mu=-87.00 As =5.68 As(r)=5.48
Mu=17.42 As =3.98 As(r)=2.90	Mu=17.42 As =3.98 As(r)=2.90	Mu=29.00 As =3.98 As(r)=2.90
Vu=92.00	Vu=17.00	Vu=17.00

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VS-304/4F

B=0.25 H=0.50 L=3.93		
Mu=-71.00 As =5.68 As(r)=4.39	Mu=-11.80 As =5.68 As(r)=3.63	Mu=-0.00 As =5.68 As(r)=3.63
Mu=14.20 As =3.98 As(r)=3.63	Mu=43.70 As =3.98 As(r)=3.63	Mu=29.85 As =3.98 As(r)=3.63
Vu=-47.00	Vu=-11.10	Vu=20.00

VS-306/4F

B=0.25 H=0.50 L=1.55		
Mu=-45.00 As =3.98 As(r)=3.63	Mu=-18.00 As =3.98 As(r)=3.63	Mu=-4.00 As =3.98 As(r)=3.63
Mu=9.00 As =3.98 As(r)=3.63	Mu=0.00 As =3.98 As(r)=3.63	Mu=7.00 As =3.98 As(r)=3.63
Vu=-38.00	Vu=-27.00	Vu=-16.00

VS-306(1)/4F

B=0.30 H=0.50 L=4.75		
Mu=-59.00 As =5.97 As(r)=4.36	Mu=-14.20 As =5.97 As(r)=4.36	Mu=-71.00 As =5.97 As(r)=4.37
Mu=19.67 As =5.97 As(r)=4.36	Mu=56.00 As =5.97 As(r)=4.36	Mu=23.67 As =5.97 As(r)=4.36
Vu=-76.00	Vu=13.00	Vu=82.00

VS-307/4F

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=7.84		
Mu=-100.00 As =8.52 As(r)=6.22	Mu=-35.40 As =17.04 As(r)=4.36	Mu=-177.00 As =13.43 As(r)=11.33	Mu=-181.00 As =13.43 As(r)=11.60	Mu=-36.20 As =17.04 As(r)=4.36	Mu=-99.00 As =8.52 As(r)=6.15
Mu=35.40 As =8.52 As(r)=4.36	Mu=85.00 As =8.52 As(r)=5.26	Mu=59.00 As =8.52 As(r)=4.36	Mu=60.33 As =8.52 As(r)=4.36	Mu=117.00 As =8.52 As(r)=7.32	Mu=36.20 As =8.52 As(r)=4.36
Vu=-99.00	Vu=16.00	Vu=121.00	Vu=-130.00	Vu=-16.00	Vu=106.00

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VS-308/4F

B=0.30 H=0.50 L=4.75			B=0.30 H=0.50 L=4.49		
Mu=-44.00 As =8.52 As(r)=4.36	Mu=-11.20 As =14.34 As(r)=4.36	Mu=-56.00 As =8.52 As(r)=4.36	Mu=-62.00 As =8.52 As(r)=4.36	Mu=-21.60 As =8.52 As(r)=4.36	Mu=-108.00 As =8.52 As(r)=6.74
Mu=14.67 As =8.52 As(r)=4.36	Mu=52.00 As =8.52 As(r)=4.36	Mu=18.67 As =8.52 As(r)=4.36	Mu=21.60 As =8.52 As(r)=4.36	Mu=21.60 As =8.52 As(r)=4.36	Mu=36.00 As =8.52 As(r)=4.36
Vu=-69.00	Vu=7.00	Vu=78.00	Vu=-64.00	Vu=15.40	Vu=80.00

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=7.84		
Mu=-104.00 As =8.52 As(r)=6.48	Mu=-32.00 As =14.34 As(r)=4.36	Mu=-160.00 As =13.43 As(r)=10.17	Mu=-171.00 As =13.43 As(r)=10.92	Mu=-34.20 As =14.49 As(r)=4.36	Mu=-72.00 As =5.97 As(r)=4.43
Mu=34.67 As =8.52 As(r)=4.36	Mu=78.00 As =8.52 As(r)=4.81	Mu=53.33 As =8.52 As(r)=4.36	Mu=57.00 As =8.52 As(r)=4.36	Mu=128.00 As =8.52 As(r)=8.04	Mu=34.20 As =8.52 As(r)=4.36
Vu=-102.00	Vu=9.00	Vu=116.00	Vu=-131.00	Vu=-14.00	Vu=105.00

VS-309/4F

B=0.30 H=0.50 L=4.75			B=0.30 H=0.50 L=4.49		
Mu=-72.00 As =8.52 As(r)=4.43	Mu=-14.40 As =14.34 As(r)=4.36	Mu=-71.00 As =8.52 As(r)=4.37	Mu=-66.00 As =8.52 As(r)=4.36	Mu=-20.40 As =8.52 As(r)=4.36	Mu=-102.00 As =8.52 As(r)=6.35
Mu=24.00 As =8.52 As(r)=4.36	Mu=51.00 As =8.52 As(r)=4.36	Mu=23.67 As =8.52 As(r)=4.36	Mu=22.00 As =8.52 As(r)=4.36	Mu=20.40 As =8.52 As(r)=4.36	Mu=34.00 As =8.52 As(r)=4.36
Vu=-75.00	Vu=13.00	Vu=81.00	Vu=-65.00	Vu=13.00	Vu=79.00

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=7.84		
Mu=-118.00 As =8.52 As(r)=7.39	Mu=-32.60 As =14.34 As(r)=4.36	Mu=-163.00 As =13.43 As(r)=10.38	Mu=-178.00 As =13.43 As(r)=11.40	Mu=-35.60 As =14.49 As(r)=4.36	Mu=-96.00 As =5.97 As(r)=5.96
Mu=39.33 As =8.52 As(r)=4.36	Mu=76.00 As =8.52 As(r)=4.69	Mu=54.33 As =8.52 As(r)=4.36	Mu=59.33 As =8.52 As(r)=4.36	Mu=121.00 As =8.52 As(r)=7.58	Mu=35.60 As =8.52 As(r)=4.36
Vu=-104.00	Vu=10.00	Vu=116.00	Vu=-130.00	Vu=-16.00	Vu=107.00

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VS-309(1)/4F

B=0.30 H=0.50 L=4.75			B=0.30 H=0.50 L=4.49		
Mu=-70.00 As =8.52 As(r)=4.36	Mu=-15.30 As =14.34 As(r)=4.36	Mu=-15.30 As =8.52 As(r)=4.36	Mu=-22.80 As =8.52 As(r)=4.36	Mu=-22.80 As =8.52 As(r)=4.36	Mu=-114.00 As =8.52 As(r)=7.13
Mu=23.33 As =8.52 As(r)=4.36	Mu=74.00 As =8.52 As(r)=4.64	Mu=26.00 As =8.52 As(r)=4.36	Mu=23.00 As =8.52 As(r)=4.36	Mu=38.00 As =8.52 As(r)=4.36	Mu=38.00 As =8.52 As(r)=4.36
Vu=-89.00	Vu=-18.00	Vu=58.00	Vu=-45.00	Vu=27.00	Vu=96.00

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=7.85		
Mu=-105.00 As =8.52 As(r)=6.54	Mu=-36.80 As =14.34 As(r)=4.36	Mu=-184.00 As =13.43 As(r)=11.81	Mu=-131.00 As =13.43 As(r)=8.24	Mu=-26.20 As =14.49 As(r)=4.36	Mu=-83.00 As =5.97 As(r)=5.13
Mu=36.80 As =8.52 As(r)=4.36	Mu=65.00 As =8.52 As(r)=4.36	Mu=61.33 As =8.52 As(r)=4.36	Mu=43.67 As =8.52 As(r)=4.36	Mu=114.00 As =8.52 As(r)=7.13	Mu=27.67 As =8.52 As(r)=4.36
Vu=-99.00	Vu=12.00	Vu=119.00	Vu=-55.00	Vu=-101.00	Vu=101.00

VS-309(2)/4F

B=0.30 H=0.50 L=4.75			B=0.30 H=0.50 L=4.49		
Mu=-67.00 As =8.52 As(r)=4.36	Mu=-13.40 As =14.34 As(r)=4.36	Mu=-62.00 As =8.52 As(r)=4.36	Mu=-60.00 As =8.52 As(r)=4.36	Mu=-17.60 As =8.52 As(r)=4.36	Mu=-88.00 As =8.52 As(r)=5.45
Mu=22.33 As =8.52 As(r)=4.36	Mu=52.00 As =8.52 As(r)=4.36	Mu=20.67 As =8.52 As(r)=4.36	Mu=23.00 As =8.52 As(r)=4.36	Mu=23.00 As =8.52 As(r)=4.36	Mu=29.33 As =8.52 As(r)=4.36
Vu=-75.00	Vu=10.00	Vu=78.00	Vu=-65.00	Vu=11.00	Vu=77.00

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=7.84		
Mu=-116.00 As =8.52 As(r)=7.26	Mu=-33.40 As =14.34 As(r)=4.36	Mu=-167.00 As =13.43 As(r)=10.65	Mu=-182.00 As =13.43 As(r)=11.67	Mu=-36.40 As =14.49 As(r)=4.36	Mu=-91.00 As =5.97 As(r)=5.64
Mu=38.67 As =8.52 As(r)=4.36	Mu=73.00 As =8.52 As(r)=4.50	Mu=55.67 As =8.52 As(r)=4.36	Mu=60.67 As =8.52 As(r)=4.36	Mu=118.00 As =8.52 As(r)=7.39	Mu=36.40 As =8.52 As(r)=4.36
Vu=-103.00	Vu=10.00	Vu=117.00	Vu=-131.00	Vu=-16.00	Vu=106.00

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VS-309(3)/4F

B=0.30 H=0.50 L=4.75			B=0.30 H=0.50 L=4.49		
Mu=-38.00 As =8.52 As(r)=4.36	Mu=-13.60 As =14.34 As(r)=4.36	Mu=-27.00 As =8.52 As(r)=4.36	Mu=-35.00 As =8.52 As(r)=4.36	Mu=-16.80 As =8.52 As(r)=4.36	Mu=-84.00 As =8.52 As(r)=5.19
Mu=13.60 As =8.52 As(r)=4.36	Mu=68.00 As =8.52 As(r)=4.36	Mu=13.60 As =8.52 As(r)=4.36	Mu=16.80 As =8.52 As(r)=4.36	Mu=29.00 As =8.52 As(r)=4.36	Mu=28.00 As =8.52 As(r)=4.36
Vu=-74.00	Vu=-3.00	Vu=73.00	Vu=-61.00	Vu=10.00	Vu=80.00

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=7.84		
Mu=-99.00 As =8.52 As(r)=6.15	Mu=-36.00 As =14.34 As(r)=4.36	Mu=-180.00 As =13.43 As(r)=11.53	Mu=-183.00 As =13.43 As(r)=11.74	Mu=-36.60 As =14.49 As(r)=4.36	Mu=-65.00 As =5.97 As(r)=4.36
Mu=36.00 As =8.52 As(r)=4.36	Mu=70.00 As =8.52 As(r)=4.36	Mu=60.00 As =8.52 As(r)=4.36	Mu=61.00 As =8.52 As(r)=4.36	Mu=124.00 As =8.52 As(r)=7.78	Mu=36.60 As =8.52 As(r)=4.36
Vu=-98.00	Vu=11.00	Vu=119.00	Vu=-133.00	Vu=-16.00	Vu=103.00

VS-312/4F

B=0.20 H=0.50 L=0.45		
Mu=-78.00 As =5.68 As(r)=4.88	Mu=-37.00 As =5.68 As(r)=2.90	Mu=-4.00 As =5.68 As(r)=2.90
Mu=15.60 As =3.98 As(r)=2.90	Mu=0.00 As =3.98 As(r)=2.90	Mu=3.00 As =3.98 As(r)=2.90
Vu=-106.00	Vu=-101.00	Vu=-95.00

VS-313/4F

B=0.30 H=0.50 L=7.84		
Mu=-205.00 As =15.88 As(r)=13.27	Mu=-41.00 As =15.39 As(r)=4.36	Mu=-119.00 As =8.52 As(r)=7.45
Mu=68.33 As =8.52 As(r)=4.36	Mu=142.70 As =11.61 As(r)=9.90	Mu=41.00 As =11.61 As(r)=4.36
Vu=-142.00	Vu=10.70	Vu=118.00

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VS-314/4F

B=0.30 H=0.50 L=4.75			B=0.30 H=0.50 L=4.49		
Mu=-145.00 As =10.88 As(r)=9.17	Mu=-29.00 As =5.97 As(r)=4.36	Mu=-29.00 As =5.97 As(r)=4.36	Mu=-34.00 As =5.97 As(r)=4.36	Mu=-34.00 As =11.94 As(r)=4.36	Mu=-170.00 As =13.33 As(r)=10.85
Mu=48.33 As =5.97 As(r)=4.36	Mu=60.00 As =5.97 As(r)=4.36	Mu=39.00 As =5.97 As(r)=4.36	Mu=40.00 As =5.97 As(r)=4.36	Mu=56.67 As =5.97 As(r)=4.36	Mu=56.67 As =5.97 As(r)=4.36
Vu=-112.00	Vu=-35.00	Vu=67.00	Vu=-48.00	Vu=42.00	Vu=118.00

B=0.30 H=0.50 L=7.21		
Mu=-185.00 As =13.33 As(r)=11.88	Mu=-37.00 As =11.94 As(r)=4.36	Mu=-139.00 As =11.13 As(r)=8.77
Mu=61.67 As =6.47 As(r)=4.36	Mu=84.00 As =5.97 As(r)=5.19	Mu=46.33 As =5.97 As(r)=4.36
Vu=-131.00	Vu=-11.00	Vu=119.00

VS-315/4F

B=0.30 H=0.50 L=4.55		
Mu=-0.00 As =5.97 As(r)=4.36	Mu=-0.00 As =5.97 As(r)=4.36	Mu=-78.00 As =5.97 As(r)=4.81
Mu=31.00 As =5.97 As(r)=4.36	Mu=78.00 As =5.97 As(r)=4.84	Mu=15.60 As =5.97 As(r)=4.36
Vu=-52.00	Vu=21.00	Vu=89.00

VP-401/5F

B=0.45 H=0.50 L=7.78			B=0.45 H=0.50 L=7.80		
Mu=-369.00 As =28.85 As(r)=24.29	Mu=-86.80 As =30.96 As(r)=6.53	Mu=-434.00 As =33.10 As(r)=29.12	Mu=-410.00 As =33.10 As(r)=27.31	Mu=-82.00 As =28.47 As(r)=6.53	Mu=-393.00 As =28.85 As(r)=26.05
Mu=123.00 As =15.48 As(r)=7.60	Mu=189.00 As =15.48 As(r)=11.87	Mu=144.67 As =15.48 As(r)=8.99	Mu=136.67 As =15.48 As(r)=8.47	Mu=174.00 As =15.48 As(r)=10.88	Mu=131.00 As =15.48 As(r)=8.11
Vu=-256.00	Vu=67.15	Vu=270.00	Vu=-257.00	Vu=-58.65	Vu=255.00

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B=0.45 H=0.50 L=5.70			B=0.45 H=0.50 L=0.95		
Mu=-307.00 As =28.85 As(r)=19.87	Mu=-61.40 As =27.43 As(r)=6.53	Mu=-272.00 As =22.16 As(r)=17.44	Mu=-85.00 As =22.16 As(r)=6.53	Mu=-39.00 As =22.16 As(r)=6.53	Mu=-0.00 As =22.16 As(r)=6.53
Mu=102.33 As =20.21 As(r)=6.53	Mu=108.80 As =15.48 As(r)=8.11	Mu=90.67 As =15.48 As(r)=6.53	Mu=17.00 As =15.48 As(r)=6.53	Mu=0.00 As =15.48 As(r)=6.53	Mu=9.00 As =15.48 As(r)=6.53
Vu=-227.00	Vu=-49.00	Vu=177.00	Vu=-86.00	Vu=-83.00	Vu=-79.00

VP-402/5F

B=0.50 H=0.50 L=7.84			B=0.50 H=0.50 L=7.80		
Mu=-627.00 As =42.21 As(r)=43.87	Mu=-134.00 As =51.00 As(r)=8.28	Mu=-670.00 As =47.52 As(r)=47.53	Mu=-634.00 As =47.52 As(r)=44.46	Mu=-134.20 As =44.58 As(r)=8.29	Mu=-671.00 As =47.52 As(r)=47.62
Mu=209.00 As =25.50 As(r)=14.42	Mu=369.00 As =25.50 As(r)=24.04	Mu=223.33 As =25.50 As(r)=14.42	Mu=211.33 As =25.50 As(r)=14.51	Mu=371.00 As =25.50 As(r)=24.18	Mu=223.67 As =25.50 As(r)=14.51
Vu=-390.00	Vu=144.65	Vu=397.00	Vu=-386.00	Vu=147.60	Vu=407.00

B=0.50 H=0.50 L=5.70			B=0.50 H=0.50 L=0.95		
Mu=-369.00 As =47.52 As(r)=24.04	Mu=-78.00 As =41.73 As(r)=7.26	Mu=-390.00 As =32.72 As(r)=25.54	Mu=-117.00 As =32.72 As(r)=7.26	Mu=-57.00 As =32.72 As(r)=7.26	Mu=-1.00 As =32.72 As(r)=7.26
Mu=123.00 As =25.50 As(r)=7.58	Mu=165.20 As =25.50 As(r)=12.40	Mu=130.00 As =19.35 As(r)=8.02	Mu=23.40 As =19.35 As(r)=7.26	Mu=0.00 As =25.50 As(r)=7.26	Mu=1.00 As =19.35 As(r)=7.26
Vu=-294.00	Vu=-86.00	Vu=254.00	Vu=-112.00	Vu=-108.00	Vu=-104.00

VP-403/5F

B=0.50 H=0.50 L=7.89			B=0.50 H=0.50 L=9.15		
Mu=-487.00 As =32.72 As(r)=32.71	Mu=-108.00 As =44.85 As(r)=7.26	Mu=-540.00 As =47.52 As(r)=36.82	Mu=-679.00 As =47.52 As(r)=48.31	Mu=-136.00 As =36.10 As(r)=8.40	Mu=-680.00 As =47.52 As(r)=48.40
Mu=162.33 As =19.35 As(r)=10.84	Mu=283.00 As =19.35 As(r)=18.06	Mu=180.00 As =25.50 As(r)=11.23	Mu=226.33 As =25.50 As(r)=14.26	Mu=345.90 As =19.35 As(r)=22.77	Mu=226.67 As =27.42 As(r)=14.28
Vu=-273.00	Vu=113.65	Vu=308.00	Vu=-365.00	Vu=47.00	Vu=467.00

B=0.50 H=0.50 L=4.35			B=0.50 H=0.50 L=0.95		
Mu=-260.00 As =47.52 As(r)=16.51	Mu=-58.00 As =44.11 As(r)=7.26	Mu=-290.00 As =19.35 As(r)=18.54	Mu=-81.00 As =19.35 As(r)=7.26	Mu=-38.00 As =19.35 As(r)=7.26	Mu=-0.00 As =19.35 As(r)=7.26
Mu=86.67 As =15.48 As(r)=7.26	Mu=133.00 As =19.35 As(r)=8.21	Mu=96.67 As =15.48 As(r)=7.26	Mu=16.20 As =15.48 As(r)=7.26	Mu=0.00 As =19.35 As(r)=7.26	Mu=4.00 As =15.48 As(r)=7.26
Vu=-186.00	Vu=173.00	Vu=188.00	Vu=-83.00	Vu=-79.00	Vu=-75.00

VP-404/5F

B=0.50 H=0.50 L=7.93			B=0.50 H=0.50 L=9.15		
Mu=-428.00 As =36.06 As(r)=28.30	Mu=-91.20 As =44.11 As(r)=7.26	Mu=-456.00 As =47.52 As(r)=30.38	Mu=-648.00 As =47.52 As(r)=45.65	Mu=-129.60 As =37.02 As(r)=8.00	Mu=-330.00 As =26.03 As(r)=21.30
Mu=142.67 As =19.35 As(r)=8.83	Mu=225.00 As =19.35 As(r)=14.17	Mu=152.00 As =19.35 As(r)=9.42	Mu=216.00 As =19.35 As(r)=13.58	Mu=243.10 As =19.35 As(r)=16.37	Mu=129.60 As =36.47 As(r)=9.82
Vu=-226.00	Vu=98.60	Vu=253.00	Vu=-310.00	Vu=-25.85	Vu=190.00

B=0.50 H=0.50 L=4.35			B=0.50 H=0.50 L=0.95		
Mu=-101.80 As =26.03 As(r)=7.26	Mu=-101.80 As =38.34 As(r)=7.26	Mu=-509.00 As =41.37 As(r)=34.40	Mu=-82.00 As =41.37 As(r)=7.26	Mu=-44.00 As =41.37 As(r)=7.26	Mu=-8.00 As =41.37 As(r)=7.26
Mu=363.00 As =25.50 As(r)=23.61	Mu=101.80 As =19.35 As(r)=7.26	Mu=169.67 As =25.50 As(r)=10.56	Mu=16.40 As =25.50 As(r)=7.26	Mu=0.00 As =19.35 As(r)=7.26	Mu=0.00 As =25.50 As(r)=7.26
Vu=143.65	Vu=261.00	Vu=277.00	Vu=-73.00	Vu=-69.00	Vu=-65.00

VP-405/5F

B=0.45 H=0.50 L=7.96			B=0.45 H=0.50 L=9.15		
Mu=-303.00 As =20.88 As(r)=19.59	Mu=-69.20 As =28.40 As(r)=6.53	Mu=-346.00 As =30.91 As(r)=22.63	Mu=-444.00 As =30.91 As(r)=29.88	Mu=-88.80 As =28.40 As(r)=6.53	Mu=-426.00 As =27.57 As(r)=28.51
Mu=101.00 As =14.20 As(r)=6.53	Mu=154.00 As =14.20 As(r)=9.59	Mu=115.33 As =14.20 As(r)=7.11	Mu=148.00 As =14.20 As(r)=9.20	Mu=183.00 As =14.20 As(r)=11.47	Mu=142.00 As =27.03 As(r)=8.81
Vu=-157.00	Vu=-69.65	Vu=195.00	Vu=-241.00	Vu=18.00	Vu=319.00

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B=0.45 H=0.50 L=4.35			B=0.45 H=0.50 L=0.95		
Mu=-271.00 As =27.57 As(r)=17.37	Mu=-54.20 As =28.40 As(r)=6.53	Mu=-197.00 As =14.20 As(r)=12.39	Mu=-68.00 As =14.20 As(r)=6.53	Mu=-32.00 As =14.20 As(r)=6.53	Mu=-0.00 As =14.20 As(r)=6.53
Mu=90.33 As =14.20 As(r)=6.53	Mu=83.00 As =14.20 As(r)=6.53	Mu=85.00 As =14.20 As(r)=6.53	Mu=13.60 As =14.20 As(r)=6.53	Mu=0.00 As =14.20 As(r)=6.53	Mu=6.00 As =14.20 As(r)=6.53
Vu=-170.00	Vu=-156.00	Vu=122.00	Vu=-69.00	Vu=-65.00	Vu=-62.00

VP-406/5F

B=0.40 H=0.50 L=4.68			B=0.40 H=0.50 L=1.52		
Mu=-151.00 As =11.36 As(r)=9.44	Mu=-30.20 As =11.36 As(r)=5.81	Mu=-142.00 As =11.36 As(r)=8.85	Mu=-157.00 As =11.36 As(r)=9.83	Mu=-80.00 As =11.36 As(r)=5.86	Mu=-31.40 As =11.36 As(r)=5.81
Mu=101.00 As =12.39 As(r)=6.23	Mu=30.20 As =12.39 As(r)=5.81	Mu=98.00 As =12.39 As(r)=6.04	Mu=94.00 As =12.39 As(r)=5.81	Mu=73.00 As =12.39 As(r)=5.81	Mu=58.00 As =12.39 As(r)=5.81
Vu=-92.00	Vu=-51.00	Vu=90.00	Vu=-95.00	Vu=-90.00	Vu=-85.00

B=0.30 H=0.50 L=2.67			B=0.40 H=0.50 L=7.16		
Mu=-31.00 As =8.52 As(r)=4.36	Mu=-33.00 As =21.95 As(r)=4.36	Mu=-155.00 As =13.43 As(r)=9.84	Mu=-157.00 As =16.27 As(r)=9.83	Mu=-33.20 As =22.72 As(r)=5.81	Mu=-166.00 As =11.36 As(r)=10.42
Mu=62.00 As =8.52 As(r)=4.36	Mu=43.00 As =12.39 As(r)=4.36	Mu=77.00 As =8.52 As(r)=4.75	Mu=52.33 As =10.51 As(r)=5.81	Mu=55.40 As =12.39 As(r)=5.81	Mu=55.33 As =11.53 As(r)=5.81
Vu=59.00	Vu=76.00	Vu=97.00	Vu=-84.00	Vu=26.00	Vu=87.00

B=0.40 H=0.50 L=7.77		
Mu=-152.00 As =11.36 As(r)=9.50	Mu=-33.20 As =22.72 As(r)=5.81	Mu=-166.00 As =11.36 As(r)=10.42
Mu=50.67 As =11.36 As(r)=5.81	Mu=61.00 As =12.39 As(r)=5.81	Mu=55.33 As =11.36 As(r)=5.81
Vu=-84.00	Vu=23.00	Vu=87.00

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VP-407/5F

B=0.40 H=0.50 L=0.95			B=0.40 H=0.50 L=4.68		
Mu=-0.00 As =14.20 As(r)=5.81	Mu=-26.00 As =14.20 As(r)=5.81	Mu=-81.00 As =14.20 As(r)=5.81	Mu=-168.00 As =14.20 As(r)=10.55	Mu=-33.60 As =11.36 As(r)=5.81	Mu=-113.00 As =11.36 As(r)=6.99
Mu=30.00 As =11.36 As(r)=5.81	Mu=2.00 As =11.36 As(r)=5.81	Mu=16.20 As =11.36 As(r)=5.81	Mu=56.00 As =11.36 As(r)=5.81	Mu=33.60 As =11.36 As(r)=5.81	Mu=75.00 As =11.36 As(r)=5.81
Vu=76.00	Vu=91.00	Vu=107.00	Vu=-115.00	Vu=-50.00	Vu=93.00

B=0.40 H=0.50 L=4.44			B=0.40 H=0.50 L=7.16		
Mu=-147.00 As =11.36 As(r)=9.18	Mu=-29.40 As =22.72 As(r)=5.81	Mu=-140.00 As =14.20 As(r)=8.72	Mu=-199.00 As =14.20 As(r)=12.60	Mu=-39.80 As =22.72 As(r)=5.81	Mu=-181.00 As =14.20 As(r)=11.40
Mu=67.00 As =11.36 As(r)=5.81	Mu=29.40 As =11.36 As(r)=5.81	Mu=73.00 As =21.62 As(r)=5.81	Mu=66.33 As =11.36 As(r)=5.81	Mu=67.00 As =11.36 As(r)=5.81	Mu=60.33 As =11.36 As(r)=5.81
Vu=-108.00	Vu=-46.00	Vu=104.00	Vu=-122.00	Vu=-22.00	Vu=117.00

B=0.40 H=0.50 L=7.77			B=0.40 H=0.50 L=0.87		
Mu=-191.00 As =14.20 As(r)=12.07	Mu=-40.80 As =22.72 As(r)=5.81	Mu=-204.00 As =14.20 As(r)=12.94	Mu=-49.00 As =14.20 As(r)=5.81	Mu=-0.00 As =14.20 As(r)=5.81	Mu=-0.00 As =14.20 As(r)=5.81
Mu=63.67 As =11.36 As(r)=5.81	Mu=87.00 As =11.36 As(r)=5.81	Mu=68.00 As =11.36 As(r)=5.81	Mu=9.80 As =11.36 As(r)=5.81	Mu=39.00 As =11.36 As(r)=5.81	Mu=75.00 As =11.36 As(r)=5.81
Vu=-123.00	Vu=18.00	Vu=126.00	Vu=-115.00	Vu=-100.00	Vu=-84.00

VP-408/5F

B=0.30 H=0.50 L=1.00			B=0.30 H=0.50 L=4.75		
Mu=-2.00 As =11.36 As(r)=4.36	Mu=-39.00 As =11.36 As(r)=4.36	Mu=-95.00 As =11.36 As(r)=5.90	Mu=-133.00 As =11.36 As(r)=8.37	Mu=-26.60 As =11.36 As(r)=4.36	Mu=-26.60 As =11.36 As(r)=4.36
Mu=12.00 As =11.36 As(r)=4.36	Mu=0.00 As =11.36 As(r)=4.36	Mu=19.00 As =11.36 As(r)=4.36	Mu=44.33 As =11.36 As(r)=4.36	Mu=63.00 As =11.36 As(r)=4.78	Mu=93.00 As =11.36 As(r)=5.93
Vu=59.00	Vu=75.00	Vu=90.00	Vu=-102.00	Vu=-43.00	Vu=28.00

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B=0.30 H=0.50 L=4.49			B=0.40 H=0.50 L=7.19		
Mu=-34.00 As =11.36 As(r)=4.36	Mu=-34.00 As =22.72 As(r)=4.36	Mu=-170.00 As =11.36 As(r)=10.85	Mu=-155.00 As =11.36 As(r)=9.70	Mu=-31.00 As =22.72 As(r)=5.81	Mu=-151.00 As =14.20 As(r)=9.44
Mu=101.00 As =11.36 As(r)=6.28	Mu=37.00 As =11.36 As(r)=4.36	Mu=56.67 As =19.61 As(r)=4.36	Mu=51.67 As =11.36 As(r)=5.81	Mu=54.00 As =11.36 As(r)=5.81	Mu=50.33 As =11.36 As(r)=5.81
Vu=-10.00	Vu=53.00	Vu=113.00	Vu=-100.00	Vu=-12.00	Vu=94.00

B=0.40 H=0.50 L=7.77			B=0.40 H=0.50 L=0.87		
Mu=-195.00 As =14.20 As(r)=12.33	Mu=-39.00 As =22.72 As(r)=5.81	Mu=-174.00 As =14.20 As(r)=10.94	Mu=-29.00 As =14.20 As(r)=5.81	Mu=-0.00 As =14.20 As(r)=5.81	Mu=-0.00 As =14.20 As(r)=5.81
Mu=65.00 As =11.36 As(r)=5.81	Mu=81.00 As =11.36 As(r)=5.81	Mu=58.00 As =11.36 As(r)=5.81	Mu=8.00 As =11.36 As(r)=5.81	Mu=36.00 As =11.36 As(r)=5.81	Mu=57.00 As =11.36 As(r)=5.81
Vu=-120.00	Vu=-17.00	Vu=115.00	Vu=-84.00	Vu=-70.00	Vu=-55.00

VP-409/5F

B=0.50 H=0.50 L=0.98			B=0.50 H=0.50 L=4.72		
Mu=-0.00 As =32.72 As(r)=7.26	Mu=-17.00 As =32.72 As(r)=7.26	Mu=-53.00 As =32.72 As(r)=7.26	Mu=-410.00 As =32.72 As(r)=26.99	Mu=-82.00 As =19.35 As(r)=7.26	Mu=-82.00 As =19.35 As(r)=7.26
Mu=16.00 As =25.50 As(r)=7.26	Mu=2.00 As =25.50 As(r)=7.26	Mu=10.60 As =25.50 As(r)=7.26	Mu=136.67 As =25.50 As(r)=8.45	Mu=82.00 As =25.50 As(r)=7.99	Mu=369.00 As =25.50 As(r)=24.04
Vu=42.00	Vu=57.00	Vu=72.00	Vu=-228.00	Vu=-165.00	Vu=-102.00

B=0.50 H=0.50 L=4.49			B=0.40 H=0.50 L=7.21		
Mu=-87.80 As =19.35 As(r)=7.26	Mu=-87.80 As =38.70 As(r)=7.26	Mu=-439.00 As =32.72 As(r)=29.11	Mu=-205.00 As =32.72 As(r)=13.00	Mu=-41.00 As =19.35 As(r)=5.81	Mu=-121.00 As =19.35 As(r)=7.50
Mu=378.00 As =25.50 As(r)=24.68	Mu=87.80 As =25.50 As(r)=7.26	Mu=146.33 As =25.78 As(r)=9.06	Mu=68.33 As =19.35 As(r)=5.81	Mu=55.00 As =25.50 As(r)=5.81	Mu=41.00 As =19.35 As(r)=5.81
Vu=122.00	Vu=182.00	Vu=242.00	Vu=-113.00	Vu=-19.00	Vu=95.00

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VP-410/5F

B=0.40 H=0.50 L=0.95			B=0.40 H=0.50 L=4.68		
Mu=-0.00 As =14.20 As(r)=5.81	Mu=-4.00 As =14.20 As(r)=5.81	Mu=-23.00 As =14.20 As(r)=5.81	Mu=-128.00 As =14.20 As(r)=7.95	Mu=-25.60 As =11.36 As(r)=5.81	Mu=-87.00 As =11.36 As(r)=5.81
Mu=11.00 As =11.36 As(r)=5.81	Mu=15.00 As =11.36 As(r)=5.81	Mu=20.00 As =11.36 As(r)=5.81	Mu=42.67 As =11.36 As(r)=5.81	Mu=43.20 As =11.36 As(r)=5.81	Mu=49.00 As =11.36 As(r)=5.81
Vu=-30.00	Vu=30.00	Vu=44.00	Vu=-96.00	Vu=-36.00	Vu=81.00

B=0.40 H=0.50 L=4.44			B=0.40 H=0.50 L=7.16		
Mu=-105.00 As =11.36 As(r)=6.48	Mu=-24.20 As =22.72 As(r)=5.81	Mu=-121.00 As =14.20 As(r)=7.50	Mu=-161.00 As =14.20 As(r)=10.09	Mu=-32.20 As =22.72 As(r)=5.81	Mu=-153.00 As =14.20 As(r)=9.57
Mu=39.00 As =11.36 As(r)=5.81	Mu=24.20 As =11.36 As(r)=5.81	Mu=40.33 As =21.62 As(r)=5.81	Mu=53.67 As =11.36 As(r)=5.81	Mu=61.00 As =11.36 As(r)=5.81	Mu=51.00 As =11.36 As(r)=5.81
Vu=-83.00	Vu=32.00	Vu=89.00	Vu=-106.00	Vu=-15.00	Vu=104.00

B=0.40 H=0.50 L=7.77			B=0.40 H=0.50 L=0.87		
Mu=-184.00 As =14.20 As(r)=11.60	Mu=-36.80 As =22.72 As(r)=5.81	Mu=-156.00 As =14.20 As(r)=9.76	Mu=-22.00 As =14.20 As(r)=5.81	Mu=-1.00 As =14.20 As(r)=5.81	Mu=-0.00 As =14.20 As(r)=5.81
Mu=61.33 As =11.36 As(r)=5.81	Mu=79.00 As =11.36 As(r)=5.81	Mu=52.00 As =11.36 As(r)=5.81	Mu=6.00 As =11.36 As(r)=5.81	Mu=21.00 As =11.36 As(r)=5.81	Mu=33.00 As =11.36 As(r)=5.81
Vu=-116.00	Vu=-16.00	Vu=108.00	Vu=-63.00	Vu=-49.00	Vu=-34.00

VS-401/5F

B=0.45 H=0.50 L=7.90			B=0.45 H=0.50 L=5.80		
Mu=-92.00 As =9.95 As(r)=6.53	Mu=-18.40 As =9.95 As(r)=6.53	Mu=-50.00 As =9.95 As(r)=6.53	Mu=-49.00 As =9.95 As(r)=6.53	Mu=-9.80 As =9.95 As(r)=6.53	Mu=-39.00 As =9.95 As(r)=6.53
Mu=30.67 As =9.95 As(r)=6.53	Mu=79.00 As =9.95 As(r)=6.53	Mu=18.40 As =9.95 As(r)=6.53	Mu=16.33 As =9.95 As(r)=6.53	Mu=26.30 As =9.95 As(r)=6.53	Mu=31.30 As =9.95 As(r)=6.53
Vu=-42.00	Vu=-43.00	Vu=33.00	Vu=-23.00	Vu=-27.00	Vu=18.00

B=0.45 H=0.50 L=1.00		
Mu=-24.00 As =9.95 As(r)=6.53	Mu=-14.00 As =9.95 As(r)=6.53	Mu=-8.00 As =9.95 As(r)=6.53
Mu=18.00 As =9.95 As(r)=6.53	Mu=9.00 As =9.95 As(r)=6.53	Mu=0.00 As =9.95 As(r)=6.53
Vu=-16.00	Vu=15.00	Vu=20.00

VS-403/5F

B=0.25 H=0.50 L=3.93		
Mu=-64.00 As =3.98 As(r)=3.95	Mu=-5.90 As =3.98 As(r)=3.63	Mu=-0.00 As =3.98 As(r)=3.63
Mu=12.80 As =3.98 As(r)=3.63	Mu=36.60 As =3.98 As(r)=3.63	Mu=26.45 As =3.98 As(r)=3.63
Vu=-47.00	Vu=-10.20	Vu=17.00

VS-404/5F

B=0.30 H=0.50 L=9.20			B=0.30 H=0.50 L=4.40		
Mu=-88.00 As =8.52 As(r)=5.45	Mu=-18.20 As =17.04 As(r)=4.36	Mu=-68.00 As =8.52 As(r)=4.36	Mu=-74.00 As =8.52 As(r)=4.56	Mu=-27.00 As =8.52 As(r)=4.36	Mu=-26.00 As =8.52 As(r)=4.36
Mu=29.33 As =8.52 As(r)=4.36	Mu=89.90 As =8.52 As(r)=5.64	Mu=21.20 As =13.33 As(r)=4.36	Mu=24.67 As =8.52 As(r)=4.36	Mu=14.80 As =8.52 As(r)=4.36	Mu=47.00 As =8.52 As(r)=4.36
Vu=-38.00	Vu=44.00	Vu=14.00	Vu=-31.00	Vu=-30.00	Vu=-20.25

B=0.30 H=0.50 L=1.00		
Mu=-17.00 As =8.52 As(r)=4.36	Mu=-9.00 As =8.52 As(r)=4.36	Mu=-3.00 As =8.52 As(r)=4.36
Mu=21.00 As =8.52 As(r)=4.36	Mu=13.00 As =8.52 As(r)=4.36	Mu=3.00 As =8.52 As(r)=4.36
Vu=-13.00	Vu=14.00	Vu=17.00

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VS-405/5F

B=0.30 H=0.50 L=4.75		
Mu=-43.00 As =5.97 As(r)=4.36	Mu=-13.20 As =5.97 As(r)=4.36	Mu=-66.00 As =5.97 As(r)=4.36
Mu=14.33 As =5.97 As(r)=4.36	Mu=56.00 As =5.97 As(r)=4.36	Mu=22.00 As =5.97 As(r)=4.36
Vu=-71.00	Vu=11.00	Vu=81.00

VS-406/5F

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=7.84		
Mu=-95.00 As =8.52 As(r)=5.90	Mu=-33.60 As =17.04 As(r)=4.36	Mu=-168.00 As =13.43 As(r)=10.71	Mu=-170.00 As =13.43 As(r)=10.85	Mu=-34.00 As =17.04 As(r)=4.36	Mu=-116.00 As =8.52 As(r)=7.26
Mu=33.60 As =8.52 As(r)=4.36	Mu=86.00 As =8.52 As(r)=5.32	Mu=56.00 As =8.52 As(r)=4.36	Mu=56.67 As =8.52 As(r)=4.36	Mu=108.00 As =8.52 As(r)=6.74	Mu=38.67 As =8.52 As(r)=4.36
Vu=-100.00	Vu=14.00	Vu=121.00	Vu=-126.00	Vu=-11.00	Vu=110.00

VS-407/5F

B=0.25 H=0.50 L=1.55		
Mu=-43.00 As =3.98 As(r)=3.63	Mu=-16.00 As =3.98 As(r)=3.63	Mu=-3.00 As =3.98 As(r)=3.63
Mu=8.60 As =3.98 As(r)=3.63	Mu=0.00 As =3.98 As(r)=3.63	Mu=6.00 As =3.98 As(r)=3.63
Vu=-36.00	Vu=-25.00	Vu=-14.00

VS-408/5F

B=0.30 H=0.50 L=4.75			B=0.30 H=0.50 L=4.49		
Mu=-35.00 As =8.52 As(r)=4.36	Mu=-11.40 As =14.34 As(r)=4.36	Mu=-57.00 As =8.52 As(r)=4.36	Mu=-59.00 As =8.52 As(r)=4.36	Mu=-21.60 As =8.52 As(r)=4.36	Mu=-108.00 As =8.52 As(r)=6.74
Mu=11.67 As =8.52 As(r)=4.36	Mu=53.00 As =8.52 As(r)=4.36	Mu=19.00 As =8.52 As(r)=4.36	Mu=21.60 As =8.52 As(r)=4.36	Mu=21.60 As =8.52 As(r)=4.36	Mu=36.00 As =8.52 As(r)=4.36
Vu=-69.00	Vu=7.00	Vu=79.00	Vu=-61.00	Vu=13.40	Vu=80.00

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=7.84		
Mu=-106.00 As =8.52 As(r)=6.61	Mu=-31.20 As =14.34 As(r)=4.36	Mu=-156.00 As =13.43 As(r)=9.90	Mu=-167.00 As =13.43 As(r)=10.65	Mu=-33.40 As =14.49 As(r)=4.36	Mu=-92.00 As =5.97 As(r)=5.71
Mu=35.33 As =8.52 As(r)=4.36	Mu=79.00 As =8.52 As(r)=4.88	Mu=52.00 As =8.52 As(r)=4.36	Mu=55.67 As =8.52 As(r)=4.36	Mu=119.00 As =8.52 As(r)=7.45	Mu=33.40 As =8.52 As(r)=4.36
Vu=-102.00	Vu=7.00	Vu=115.00	Vu=-128.00	Vu=-11.00	Vu=108.00

VS-409/5F

B=0.30 H=0.50 L=4.75			B=0.30 H=0.50 L=4.49		
Mu=-58.00 As =8.52 As(r)=4.36	Mu=-12.40 As =14.34 As(r)=4.36	Mu=-62.00 As =8.52 As(r)=4.36	Mu=-59.00 As =8.52 As(r)=4.36	Mu=-19.40 As =8.52 As(r)=4.36	Mu=-97.00 As =8.52 As(r)=6.03
Mu=19.33 As =8.52 As(r)=4.36	Mu=49.00 As =8.52 As(r)=4.36	Mu=20.67 As =8.52 As(r)=4.36	Mu=19.67 As =8.52 As(r)=4.36	Mu=19.40 As =8.52 As(r)=4.36	Mu=32.33 As =8.52 As(r)=4.36
Vu=-72.00	Vu=8.00	Vu=77.00	Vu=-63.00	Vu=12.00	Vu=79.00

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=7.84		
Mu=-117.00 As =8.52 As(r)=7.32	Mu=-31.20 As =14.34 As(r)=4.36	Mu=-156.00 As =13.43 As(r)=9.90	Mu=-167.00 As =13.43 As(r)=10.65	Mu=-33.40 As =14.49 As(r)=4.36	Mu=-119.00 As =5.97 As(r)=7.45
Mu=39.00 As =8.52 As(r)=4.36	Mu=77.00 As =8.52 As(r)=4.75	Mu=52.00 As =8.52 As(r)=4.36	Mu=55.67 As =8.52 As(r)=4.36	Mu=111.00 As =8.52 As(r)=6.93	Mu=39.67 As =8.52 As(r)=4.36
Vu=-105.00	Vu=8.00	Vu=115.00	Vu=-126.00	Vu=-11.00	Vu=112.00

VS-413/5F

B=0.30 H=0.50 L=1.00			B=0.30 H=0.50 L=4.75		
Mu=-19.00 As =7.96 As(r)=4.36	Mu=-3.80 As =7.96 As(r)=4.36	Mu=-3.80 As =7.96 As(r)=4.36	Mu=-29.00 As =7.96 As(r)=4.36	Mu=-14.00 As =5.97 As(r)=4.36	Mu=-28.00 As =5.97 As(r)=4.36
Mu=6.33 As =8.52 As(r)=4.36	Mu=3.80 As =8.52 As(r)=4.36	Mu=7.00 As =8.52 As(r)=4.36	Mu=14.00 As =8.52 As(r)=4.36	Mu=70.00 As =8.52 As(r)=4.36	Mu=14.00 As =8.52 As(r)=4.36
Vu=-37.00	Vu=-18.00	Vu=3.00	Vu=-73.00	Vu=2.00	Vu=74.00

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B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-35.00 As =5.97 As(r)=4.36	Mu=-16.80 As =14.49 As(r)=4.36	Mu=-84.00 As =8.52 As(r)=5.19	Mu=-100.00 As =8.52 As(r)=6.22	Mu=-35.00 As =17.04 As(r)=4.36	Mu=-175.00 As =13.43 As(r)=11.19
Mu=16.80 As =8.52 As(r)=4.36	Mu=29.00 As =8.52 As(r)=4.36	Mu=28.00 As =14.71 As(r)=4.36	Mu=35.00 As =8.52 As(r)=4.36	Mu=72.00 As =8.52 As(r)=4.43	Mu=58.33 As =8.52 As(r)=4.36
Vu=-61.00	Vu=10.00	Vu=80.00	Vu=-99.00	Vu=10.00	Vu=119.00

B=0.30 H=0.50 L=7.84			B=0.30 H=0.50 L=0.92		
Mu=-177.00 As =13.43 As(r)=11.33	Mu=-35.40 As =17.04 As(r)=4.36	Mu=-86.00 As =8.52 As(r)=5.32	Mu=-22.00 As =8.52 As(r)=4.36	Mu=-35.00 As =8.52 As(r)=4.36	Mu=-61.00 As =8.52 As(r)=4.36
Mu=59.00 As =9.21 As(r)=4.36	Mu=116.00 As =8.52 As(r)=7.26	Mu=35.40 As =8.52 As(r)=4.36	Mu=12.20 As =8.52 As(r)=4.36	Mu=12.20 As =8.52 As(r)=4.36	Mu=20.33 As =8.52 As(r)=4.36
Vu=-129.00	Vu=-12.00	Vu=106.00	Vu=12.00	Vu=32.00	Vu=51.00

VS-413(1)/5F

B=0.30 H=0.50 L=1.00			B=0.30 H=0.50 L=4.75		
Mu=-2.00 As =7.96 As(r)=4.36	Mu=-15.00 As =7.96 As(r)=4.36	Mu=-52.00 As =7.96 As(r)=4.36	Mu=-52.00 As =7.96 As(r)=4.36	Mu=-11.40 As =5.97 As(r)=4.36	Mu=-57.00 As =5.97 As(r)=4.36
Mu=11.00 As =8.52 As(r)=4.36	Mu=0.00 As =8.52 As(r)=4.36	Mu=10.40 As =8.52 As(r)=4.36	Mu=17.33 As =8.52 As(r)=4.36	Mu=52.00 As =8.52 As(r)=4.36	Mu=19.00 As =8.52 As(r)=4.36
Vu=28.00	Vu=46.00	Vu=64.00	Vu=-72.00	Vu=7.00	Vu=77.00

B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-55.00 As =5.97 As(r)=4.36	Mu=-16.40 As =14.49 As(r)=4.36	Mu=-82.00 As =8.52 As(r)=5.07	Mu=-115.00 As =8.52 As(r)=7.19	Mu=-31.80 As =17.04 As(r)=4.36	Mu=-159.00 As =13.43 As(r)=10.11
Mu=23.00 As =8.52 As(r)=4.36	Mu=23.00 As =8.52 As(r)=4.36	Mu=27.33 As =14.71 As(r)=4.36	Mu=38.33 As =8.52 As(r)=4.36	Mu=75.00 As =8.52 As(r)=4.62	Mu=53.00 As =8.52 As(r)=4.36
Vu=-65.00	Vu=9.00	Vu=77.00	Vu=-104.00	Vu=8.00	Vu=116.00

B=0.30 H=0.50 L=7.84			B=0.30 H=0.50 L=0.92		
Mu=-170.00 As =13.43 As(r)=10.85	Mu=-34.00 As =17.04 As(r)=4.36	Mu=-112.00 As =8.52 As(r)=7.00	Mu=-73.00 As =8.52 As(r)=4.50	Mu=-33.00 As =8.52 As(r)=4.36	Mu=-20.00 As =8.52 As(r)=4.36
Mu=56.67 As =9.21 As(r)=4.36	Mu=110.00 As =8.52 As(r)=6.87	Mu=37.33 As =8.52 As(r)=4.36	Mu=14.60 As =8.52 As(r)=4.36	Mu=0.00 As =8.52 As(r)=4.36	Mu=5.00 As =8.52 As(r)=4.36
Vu=-127.00	Vu=-10.00	Vu=111.00	Vu=-72.00	Vu=-55.00	Vu=-37.00

VS-414/5F

B=0.30 H=0.50 L=1.00			B=0.30 H=0.50 L=4.75		
Mu=-21.00 As =7.96 As(r)=4.36	Mu=-11.00 As =7.96 As(r)=4.36	Mu=-13.00 As =7.96 As(r)=4.36	Mu=-55.00 As =7.96 As(r)=4.36	Mu=-15.40 As =5.97 As(r)=4.36	Mu=-15.40 As =5.97 As(r)=4.36
Mu=7.00 As =8.52 As(r)=4.36	Mu=4.20 As =8.52 As(r)=4.36	Mu=4.33 As =8.52 As(r)=4.36	Mu=18.33 As =8.52 As(r)=4.36	Mu=77.00 As =8.52 As(r)=4.75	Mu=21.00 As =8.52 As(r)=4.36
Vu=-28.00	Vu=-11.00	Vu=14.00	Vu=-86.00	Vu=-14.00	Vu=61.00

B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-22.60 As =5.97 As(r)=4.36	Mu=-22.60 As =14.79 As(r)=4.36	Mu=-113.00 As =13.43 As(r)=7.06	Mu=-104.00 As =13.43 As(r)=6.48	Mu=-36.40 As =17.04 As(r)=4.36	Mu=-182.00 As =13.43 As(r)=11.67
Mu=22.60 As =8.52 As(r)=4.36	Mu=37.67 As =8.52 As(r)=4.36	Mu=37.67 As =14.71 As(r)=4.36	Mu=36.40 As =8.52 As(r)=4.36	Mu=67.00 As =8.52 As(r)=4.36	Mu=60.67 As =8.52 As(r)=4.36
Vu=-46.00	Vu=25.00	Vu=96.00	Vu=-99.00	Vu=11.00	Vu=119.00

B=0.30 H=0.50 L=7.84			B=0.30 H=0.50 L=0.92		
Mu=-181.00 As =13.43 As(r)=11.60	Mu=-36.20 As =17.04 As(r)=4.36	Mu=-107.00 As =8.52 As(r)=6.67	Mu=-75.00 As =8.52 As(r)=4.62	Mu=-32.00 As =8.52 As(r)=4.36	Mu=-16.00 As =8.52 As(r)=4.36
Mu=60.33 As =9.21 As(r)=4.36	Mu=105.00 As =8.52 As(r)=6.54	Mu=36.20 As =8.52 As(r)=4.36	Mu=15.00 As =8.52 As(r)=4.36	Mu=0.00 As =8.52 As(r)=4.36	Mu=9.00 As =8.52 As(r)=4.36
Vu=-128.00	Vu=-13.00	Vu=108.00	Vu=-76.00	Vu=-58.00	Vu=-41.00

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VS-415/5F

B=0.30 H=0.50 L=7.84			B=0.30 H=0.50 L=0.92		
Mu=-139.00 As =11.96 As(r)=8.77	Mu=-27.80 As =17.04 As(r)=4.36	Mu=-114.00 As =8.52 As(r)=7.13	Mu=-69.00 As =8.52 As(r)=4.36	Mu=-33.00 As =8.52 As(r)=4.36	Mu=-29.00 As =8.52 As(r)=4.36
Mu=46.33 As =8.03 As(r)=4.36	Mu=104.00 As =8.52 As(r)=6.48	Mu=38.00 As =8.52 As(r)=4.36	Mu=23.00 As =8.52 As(r)=4.36	Mu=13.80 As =14.49 As(r)=4.36	Mu=13.80 As =8.52 As(r)=4.36
Vu=-113.00	Vu=-7.00	Vu=105.00	Vu=-64.00	Vu=-48.00	Vu=-31.00

VS-416/5F

B=0.30 H=0.50 L=1.00			B=0.30 H=0.50 L=4.75		
Mu=-10.00 As =7.96 As(r)=4.36	Mu=-27.00 As =7.96 As(r)=4.36	Mu=-59.00 As =7.96 As(r)=4.36	Mu=-119.00 As =7.96 As(r)=7.45	Mu=-23.80 As =5.97 As(r)=4.36	Mu=-23.80 As =5.97 As(r)=4.36
Mu=0.00 As =8.52 As(r)=4.36	Mu=0.00 As =8.52 As(r)=4.36	Mu=11.80 As =8.52 As(r)=4.36	Mu=39.67 As =8.52 As(r)=4.36	Mu=63.00 As =8.52 As(r)=4.36	Mu=24.00 As =8.52 As(r)=4.36
Vu=16.00	Vu=36.00	Vu=56.00	Vu=-106.00	Vu=-27.00	Vu=64.00

B=0.30 H=0.50 L=4.49			B=0.30 H=0.50 L=7.21		
Mu=-31.00 As =5.97 As(r)=4.36	Mu=-31.00 As =14.79 As(r)=4.36	Mu=-155.00 As =13.43 As(r)=9.84	Mu=-170.00 As =13.43 As(r)=10.85	Mu=-34.00 As =17.04 As(r)=4.36	Mu=-165.00 As =13.43 As(r)=10.51
Mu=31.00 As =8.52 As(r)=4.36	Mu=51.60 As =8.52 As(r)=4.36	Mu=51.67 As =14.71 As(r)=4.36	Mu=56.67 As =8.52 As(r)=4.36	Mu=73.00 As =8.52 As(r)=4.50	Mu=55.00 As =8.52 As(r)=4.36
Vu=-47.00	Vu=36.00	Vu=115.00	Vu=-126.00	Vu=-3.00	Vu=124.00

B=0.30 H=0.50 L=7.84			B=0.30 H=0.50 L=0.92		
Mu=-173.00 As =13.43 As(r)=11.06	Mu=-34.60 As =17.04 As(r)=4.36	Mu=-117.00 As =8.52 As(r)=7.32	Mu=-61.00 As =8.52 As(r)=4.36	Mu=-37.00 As =8.52 As(r)=4.36	Mu=-35.00 As =8.52 As(r)=4.36
Mu=57.67 As =9.21 As(r)=4.36	Mu=112.00 As =8.52 As(r)=7.00	Mu=39.00 As =8.52 As(r)=4.36	Mu=20.33 As =8.52 As(r)=4.36	Mu=12.20 As =8.52 As(r)=4.36	Mu=12.20 As =8.52 As(r)=4.36
Vu=-130.00	Vu=-10.00	Vu=114.00	Vu=-48.00	Vu=-30.00	Vu=13.00

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VPC-01/Roof

B=0.50 H=0.50 L=7.84			B=0.50 H=0.50 L=7.80		
Mu=-328.00 As =24.23 As(r)=21.16	Mu=-85.40 As =28.40 As(r)=7.26	Mu=-427.00 As =30.91 As(r)=28.23	Mu=-352.00 As =30.91 As(r)=22.84	Mu=-86.80 As =28.40 As(r)=7.26	Mu=-434.00 As =30.91 As(r)=28.75
Mu=109.33 As =19.35 As(r)=7.91	Mu=210.00 As =19.35 As(r)=13.18	Mu=142.33 As =19.35 As(r)=8.81	Mu=117.33 As =25.26 As(r)=7.67	Mu=204.00 As =19.35 As(r)=12.79	Mu=144.67 As =19.35 As(r)=8.96
Vu=-225.00	Vu=79.60	Vu=257.00	Vu=-228.00	Vu=80.65	Vu=260.00

B=0.50 H=0.50 L=1.99		
Mu=-156.00 As =30.91 As(r)=9.68	Mu=-31.20 As =24.85 As(r)=7.26	Mu=-31.20 As =14.20 As(r)=7.26
Mu=52.00 As =19.35 As(r)=7.26	Mu=31.20 As =19.35 As(r)=7.26	Mu=31.20 As =19.35 As(r)=7.26
Vu=-144.00	Vu=-136.00	Vu=-42.00

VPC-02/Roof

B=0.50 H=0.50 L=7.89			B=0.50 H=0.50 L=9.15		
Mu=-357.00 As =24.23 As(r)=23.19	Mu=-92.60 As =33.55 As(r)=7.26	Mu=-463.00 As =36.06 As(r)=30.90	Mu=-525.00 As =36.06 As(r)=35.64	Mu=-105.00 As =26.49 As(r)=7.26	Mu=-517.00 As =36.06 As(r)=35.02
Mu=119.00 As =19.35 As(r)=9.50	Mu=250.00 As =19.35 As(r)=15.84	Mu=154.33 As =19.35 As(r)=9.57	Mu=175.00 As =26.95 As(r)=11.16	Mu=282.40 As =19.35 As(r)=18.61	Mu=172.33 As =19.35 As(r)=11.16
Vu=-239.00	Vu=104.60	Vu=271.00	Vu=-298.00	Vu=40.00	Vu=361.00

B=0.50 H=0.50 L=0.64		
Mu=-84.00 As =36.06 As(r)=7.26	Mu=-45.00 As =36.06 As(r)=7.26	Mu=-8.00 As =36.06 As(r)=7.26
Mu=16.80 As =19.35 As(r)=7.26	Mu=0.00 As =19.35 As(r)=7.26	Mu=0.00 As =19.35 As(r)=7.26
Vu=-100.00	Vu=-97.00	Vu=-95.00

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VPC-03/Roof

B=0.50 H=0.50 L=7.93			B=0.50 H=0.50 L=9.15		
Mu=-283.00 As =24.23 As(r)=18.06	Mu=-74.80 As =33.55 As(r)=7.26	Mu=-374.00 As =36.06 As(r)=24.40	Mu=-511.00 As =36.06 As(r)=34.56	Mu=-102.20 As =25.19 As(r)=7.26	Mu=-302.00 As =36.06 As(r)=19.36
Mu=94.33 As =19.35 As(r)=7.26	Mu=170.00 As =19.35 As(r)=10.58	Mu=124.67 As =19.35 As(r)=7.69	Mu=170.33 As =28.63 As(r)=10.60	Mu=182.20 As =19.35 As(r)=11.81	Mu=102.20 As =19.35 As(r)=7.26
Vu=-182.00	Vu=74.15	Vu=215.00	Vu=-265.00	Vu=-16.85	Vu=207.00

B=0.50 H=0.50 L=0.64		
Mu=-18.00 As =36.06 As(r)=7.26	Mu=-8.00 As =36.06 As(r)=7.26	Mu=-1.00 As =36.06 As(r)=7.26
Mu=3.60 As =19.35 As(r)=7.26	Mu=5.00 As =19.35 As(r)=7.26	Mu=7.00 As =19.35 As(r)=7.26
Vu=-29.00	Vu=-26.00	Vu=-24.00

VPC-04/Roof

B=0.40 H=0.50 L=1.88			B=0.40 H=0.50 L=4.44		
Mu=-0.00 As =7.96 As(r)=5.81	Mu=-44.00 As =11.40 As(r)=5.81	Mu=-111.00 As =11.40 As(r)=6.86	Mu=-146.00 As =11.40 As(r)=9.11	Mu=-29.20 As =13.30 As(r)=5.81	Mu=-111.00 As =9.95 As(r)=6.86
Mu=14.00 As =7.96 As(r)=5.81	Mu=0.00 As =7.96 As(r)=5.81	Mu=22.20 As =7.96 As(r)=5.81	Mu=48.67 As =7.96 As(r)=5.81	Mu=31.05 As =7.96 As(r)=5.81	Mu=46.00 As =7.96 As(r)=5.81
Vu=39.00	Vu=56.00	Vu=73.00	Vu=-97.00	Vu=43.00	Vu=75.00

B=0.40 H=0.50 L=7.16			B=0.40 H=0.50 L=1.88		
Mu=-109.00 As =9.95 As(r)=6.74	Mu=-23.60 As =15.92 As(r)=5.81	Mu=-118.00 As =9.95 As(r)=7.31	Mu=-90.00 As =9.95 As(r)=5.81	Mu=-29.00 As =9.95 As(r)=5.81	Mu=-0.00 As =9.95 As(r)=5.81
Mu=36.33 As =7.96 As(r)=5.81	Mu=39.40 As =7.96 As(r)=5.81	Mu=39.33 As =7.96 As(r)=5.81	Mu=18.00 As =7.96 As(r)=5.81	Mu=0.00 As =7.96 As(r)=5.81	Mu=24.00 As =7.96 As(r)=5.81
Vu=-66.00	Vu=16.00	Vu=67.00	Vu=-65.00	Vu=-49.00	Vu=-34.00

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VPC-05/Roof

B=0.40 H=0.50 L=1.88			B=0.40 H=0.50 L=4.44		
Mu=-0.00 As =7.96 As(r)=5.81	Mu=-79.00 As =14.83 As(r)=6.84	Mu=-247.00 As =14.83 As(r)=15.86	Mu=-183.00 As =14.83 As(r)=11.54	Mu=-36.60 As =13.30 As(r)=5.81	Mu=-59.00 As =9.95 As(r)=5.81
Mu=66.00 As =7.96 As(r)=5.81	Mu=0.00 As =7.96 As(r)=5.81	Mu=49.40 As =7.96 As(r)=5.81	Mu=61.00 As =7.96 As(r)=5.81	Mu=36.60 As =7.96 As(r)=5.81	Mu=55.00 As =7.96 As(r)=5.81
Vu=119.00	Vu=146.00	Vu=173.00	Vu=-103.00	Vu=-52.00	Vu=51.00

B=0.40 H=0.50 L=7.16			B=0.40 H=0.50 L=1.88		
Mu=-142.00 As =9.95 As(r)=8.85	Mu=-28.40 As =15.92 As(r)=5.81	Mu=-131.00 As =9.95 As(r)=8.14	Mu=-181.00 As =9.95 As(r)=11.40	Mu=-49.00 As =9.95 As(r)=5.81	Mu=-0.00 As =9.95 As(r)=5.81
Mu=47.33 As =7.96 As(r)=5.81	Mu=62.00 As =7.96 As(r)=5.81	Mu=43.67 As =7.96 As(r)=5.81	Mu=36.20 As =7.96 As(r)=5.81	Mu=0.00 As =7.96 As(r)=5.81	Mu=62.00 As =7.96 As(r)=5.81
Vu=-96.00	Vu=-15.00	Vu=92.00	Vu=-137.00	Vu=-111.00	Vu=-87.00

VPC-06/Roof

B=0.30 H=0.50 L=1.90			B=0.30 H=0.50 L=4.49		
Mu=-13.00 As =5.97 As(r)=4.36	Mu=-13.00 As =5.97 As(r)=4.36	Mu=-65.00 As =5.97 As(r)=4.36	Mu=-28.00 As =5.97 As(r)=4.36	Mu=-23.00 As =10.86 As(r)=4.36	Mu=-115.00 As =9.41 As(r)=7.19
Mu=18.00 As =5.97 As(r)=4.36	Mu=13.00 As =5.97 As(r)=4.36	Mu=21.67 As =5.97 As(r)=4.36	Mu=23.00 As =5.97 As(r)=4.36	Mu=23.00 As =5.97 As(r)=4.36	Mu=38.33 As =5.97 As(r)=4.36
Vu=13.00	Vu=35.00	Vu=56.00	Vu=-30.00	Vu=22.00	Vu=70.00

B=0.40 H=0.50 L=7.19			B=0.40 H=0.50 L=1.88		
Mu=-117.00 As =11.40 As(r)=7.25	Mu=-23.40 As =15.92 As(r)=5.81	Mu=-113.00 As =13.12 As(r)=6.99	Mu=-166.00 As =13.12 As(r)=10.42	Mu=-50.00 As =13.12 As(r)=5.81	Mu=-0.00 As =13.12 As(r)=5.81
Mu=39.00 As =7.96 As(r)=5.81	Mu=53.00 As =5.97 As(r)=5.81	Mu=37.67 As =7.13 As(r)=5.81	Mu=33.20 As =5.97 As(r)=5.81	Mu=0.00 As =5.97 As(r)=5.81	Mu=45.00 As =5.97 As(r)=5.81
Vu=-83.00	Vu=-9.00	Vu=77.00	Vu=-118.00	Vu=-97.00	Vu=-77.00

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VPC-07/Roof

B=0.40 H=0.50 L=1.90			B=0.40 H=0.50 L=4.49		
Mu=-0.00 As =7.96 As(r)=5.81	Mu=-42.00 As =11.40 As(r)=5.81	Mu=-137.00 As =11.40 As(r)=8.53	Mu=-43.00 As =11.40 As(r)=5.81	Mu=-43.00 As =13.30 As(r)=5.81	Mu=-215.00 As =15.32 As(r)=13.68
Mu=36.00 As =7.96 As(r)=5.81	Mu=0.00 As =7.96 As(r)=5.81	Mu=27.40 As =7.96 As(r)=5.81	Mu=118.00 As =7.96 As(r)=7.31	Mu=43.00 As =7.96 As(r)=5.81	Mu=71.67 As =7.96 As(r)=5.81
Vu=64.00	Vu=80.00	Vu=97.00	Vu=40.00	Vu=74.00	Vu=109.00

B=0.40 H=0.50 L=7.21			B=0.40 H=0.50 L=1.90		
Mu=-153.00 As =15.32 As(r)=9.57	Mu=-30.60 As =15.92 As(r)=5.81	Mu=-58.00 As =9.95 As(r)=5.81	Mu=-58.00 As =9.95 As(r)=5.81	Mu=-18.00 As =9.95 As(r)=5.81	Mu=-11.60 As =9.95 As(r)=5.81
Mu=51.00 As =7.96 As(r)=5.81	Mu=41.50 As =7.96 As(r)=5.81	Mu=30.60 As =7.96 As(r)=5.81	Mu=19.33 As =7.96 As(r)=5.81	Mu=11.60 As =7.96 As(r)=5.81	Mu=11.60 As =7.96 As(r)=5.81
Vu=-77.00	Vu=-20.00	Vu=52.00	Vu=-43.00	Vu=-24.00	Vu=7.00

VSC-01/Roof

B=0.50 H=0.50 L=7.92			B=0.50 H=0.50 L=7.90		
Mu=-18.00 As =9.95 As(r)=7.26	Mu=-16.40 As =19.90 As(r)=7.26	Mu=-74.00 As =9.95 As(r)=7.26	Mu=-66.00 As =9.95 As(r)=7.26	Mu=-17.80 As =19.90 As(r)=7.26	Mu=-89.00 As =9.95 As(r)=7.26
Mu=16.40 As =9.95 As(r)=7.26	Mu=82.00 As =9.95 As(r)=7.26	Mu=24.67 As =9.95 As(r)=7.26	Mu=22.00 As =9.95 As(r)=7.26	Mu=61.00 As =9.95 As(r)=7.26	Mu=29.67 As =9.95 As(r)=7.26
Vu=-34.00	Vu=26.60	Vu=45.00	Vu=-42.00	Vu=24.65	Vu=39.00

B=0.50 H=0.50 L=2.04		
Mu=-77.00 As =9.95 As(r)=7.26	Mu=-34.00 As =9.95 As(r)=7.26	Mu=-15.40 As =9.95 As(r)=7.26
Mu=25.67 As =9.95 As(r)=7.26	Mu=15.40 As =9.95 As(r)=7.26	Mu=15.40 As =9.95 As(r)=7.26
Vu=-38.00	Vu=-28.00	Vu=-23.00

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VSC-02/Roof

B=0.25 H=0.50 L=3.88		
Mu=-44.00 As =5.97 As(r)=3.63	Mu=-0.00 As =5.97 As(r)=3.63	Mu=-0.00 As =5.97 As(r)=3.63
Mu=8.80 As =5.97 As(r)=3.63	Mu=44.00 As =5.97 As(r)=3.63	Mu=22.95 As =5.97 As(r)=3.63
Vu=-43.00	Vu=-9.00	Vu=16.00

VSC-03/Roof

B=0.50 H=0.50 L=8.04			B=0.50 H=0.50 L=7.95		
Mu=-29.00 As =9.95 As(r)=7.26	Mu=-27.20 As =19.90 As(r)=7.26	Mu=-136.00 As =11.94 As(r)=8.40	Mu=-153.00 As =11.94 As(r)=9.49	Mu=-30.60 As =10.69 As(r)=7.26	Mu=-30.60 As =9.95 As(r)=7.26
Mu=27.20 As =9.95 As(r)=7.26	Mu=66.75 As =9.95 As(r)=7.26	Mu=45.33 As =9.95 As(r)=7.26	Mu=51.00 As =14.10 As(r)=7.26	Mu=92.70 As =9.95 As(r)=7.26	Mu=79.40 As =9.95 As(r)=7.26
Vu=-39.00	Vu=31.65	Vu=59.00	Vu=-60.00	Vu=-51.15	Vu=40.00

B=0.50 H=0.50 L=2.09		
Mu=-11.40 As =9.95 As(r)=7.26	Mu=-41.00 As =9.95 As(r)=7.26	Mu=-11.40 As =9.95 As(r)=7.26
Mu=57.00 As =9.95 As(r)=7.26	Mu=11.40 As =9.95 As(r)=7.26	Mu=11.40 As =9.95 As(r)=7.26
Vu=35.75	Vu=44.00	Vu=-15.80

VSC-04/Roof

B=0.30 H=0.50 L=1.90		
Mu=-16.00 As =5.97 As(r)=4.36	Mu=-13.00 As =5.97 As(r)=4.36	Mu=-56.00 As =5.97 As(r)=4.36
Mu=11.20 As =5.97 As(r)=4.36	Mu=11.20 As =5.97 As(r)=4.36	Mu=18.67 As =5.97 As(r)=4.36
Vu=-17.00	Vu=24.00	Vu=49.00

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VSC-05/Roof

B=0.30 H=0.50 L=2.69			B=0.30 H=0.50 L=7.21		
Mu=-14.60 As =5.97 As(r)=4.36	Mu=-14.60 As =7.96 As(r)=4.36	Mu=-73.00 As =7.96 As(r)=4.50	Mu=-97.00 As =7.96 As(r)=6.03	Mu=-20.60 As =11.94 As(r)=4.36	Mu=-103.00 As =7.96 As(r)=6.41
Mu=14.60 As =5.97 As(r)=4.36	Mu=14.60 As =5.97 As(r)=4.36	Mu=24.33 As =5.97 As(r)=4.36	Mu=32.33 As =9.45 As(r)=4.36	Mu=78.00 As =11.94 As(r)=4.81	Mu=34.33 As =5.97 As(r)=4.36
Vu=-14.00	Vu=24.00	Vu=61.00	Vu=-91.00	Vu=4.00	Vu=91.00

B=0.30 H=0.50 L=1.90		
Mu=-79.00 As =7.96 As(r)=4.88	Mu=-26.00 As =7.96 As(r)=4.36	Mu=-15.80 As =5.97 As(r)=4.36
Mu=26.33 As =5.97 As(r)=4.36	Mu=15.80 As =5.97 As(r)=4.36	Mu=15.80 As =5.97 As(r)=4.36
Vu=-59.00	Vu=-34.00	Vu=-9.00

VSC-06/Roof

B=0.25 H=0.50 L=1.55		
Mu=-48.00 As =3.98 As(r)=3.63	Mu=-17.00 As =3.98 As(r)=3.63	Mu=-5.00 As =3.98 As(r)=3.63
Mu=9.60 As =3.98 As(r)=3.63	Mu=1.00 As =3.98 As(r)=3.63	Mu=5.00 As =3.98 As(r)=3.63
Vu=-41.00	Vu=-25.00	Vu=-8.00

VSC-07/Roof

B=0.30 H=0.50 L=1.90			B=0.30 H=0.50 L=4.49		
Mu=-34.00 As =5.97 As(r)=4.36	Mu=-24.00 As =9.23 As(r)=4.36	Mu=-45.00 As =9.41 As(r)=4.36	Mu=-70.00 As =9.41 As(r)=4.36	Mu=-15.20 As =11.94 As(r)=4.36	Mu=-76.00 As =5.97 As(r)=4.69
Mu=9.00 As =5.97 As(r)=4.36	Mu=9.00 As =5.97 As(r)=4.36	Mu=15.00 As =5.97 As(r)=4.36	Mu=23.33 As =5.97 As(r)=4.36	Mu=15.20 As =5.97 As(r)=4.36	Mu=25.33 As =5.97 As(r)=4.36
Vu=-25.00	Vu=5.00	Vu=31.00	Vu=-59.00	Vu=6.80	Vu=63.00

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B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=1.90		
Mu=-93.00 As =5.97 As(r)=5.77	Mu=-18.60 As =11.94 As(r)=4.36	Mu=-88.00 As =9.41 As(r)=5.45	Mu=-47.00 As =9.41 As(r)=4.36	Mu=-28.00 As =9.41 As(r)=4.36	Mu=-41.00 As =9.41 As(r)=4.36
Mu=31.00 As =9.45 As(r)=4.36	Mu=84.00 As =5.97 As(r)=5.19	Mu=29.33 As =5.97 As(r)=4.36	Mu=15.67 As =5.97 As(r)=4.36	Mu=9.40 As =5.97 As(r)=4.36	Mu=9.40 As =5.97 As(r)=4.36
Vu=-91.00	Vu=-3.00	Vu=89.00	Vu=-30.00	Vu=-3.00	Vu=26.00

VSC-07(1)/Roof

B=0.30 H=0.50 L=1.90			B=0.30 H=0.50 L=4.49		
Mu=-22.00 As =5.97 As(r)=4.36	Mu=-30.00 As =9.23 As(r)=4.36	Mu=-84.00 As =9.41 As(r)=5.19	Mu=-84.00 As =9.41 As(r)=5.19	Mu=-16.80 As =11.94 As(r)=4.36	Mu=-69.00 As =5.97 As(r)=4.36
Mu=16.80 As =5.97 As(r)=4.36	Mu=16.80 As =5.97 As(r)=4.36	Mu=28.00 As =5.97 As(r)=4.36	Mu=28.00 As =5.97 As(r)=4.36	Mu=16.80 As =5.97 As(r)=4.36	Mu=23.00 As =5.97 As(r)=4.36
Vu=10.00	Vu=34.00	Vu=60.00	Vu=-60.00	Vu=-6.00	Vu=58.00

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=1.90		
Mu=-96.00 As =5.97 As(r)=5.96	Mu=-20.80 As =11.94 As(r)=4.36	Mu=-104.00 As =9.41 As(r)=6.48	Mu=-94.00 As =9.41 As(r)=5.83	Mu=-30.00 As =9.41 As(r)=4.36	Mu=-8.00 As =9.41 As(r)=4.36
Mu=32.00 As =9.45 As(r)=4.36	Mu=78.00 As =5.97 As(r)=4.81	Mu=34.67 As =5.97 As(r)=4.36	Mu=18.80 As =5.97 As(r)=4.36	Mu=0.00 As =5.97 As(r)=4.36	Mu=10.00 As =5.97 As(r)=4.36
Vu=-91.00	Vu=4.00	Vu=91.00	Vu=-68.00	Vu=-43.00	Vu=-18.00

VSC-07(2)/Roof

B=0.30 H=0.50 L=1.90			B=0.30 H=0.50 L=4.49		
Mu=-27.00 As =5.97 As(r)=4.36	Mu=-13.00 As =9.23 As(r)=4.36	Mu=-33.00 As =9.41 As(r)=4.36	Mu=-51.00 As =9.41 As(r)=4.36	Mu=-17.00 As =11.94 As(r)=4.36	Mu=-85.00 As =5.97 As(r)=5.26
Mu=6.60 As =5.97 As(r)=4.36	Mu=6.60 As =5.97 As(r)=4.36	Mu=11.00 As =5.97 As(r)=4.36	Mu=17.00 As =5.97 As(r)=4.36	Mu=17.00 As =5.97 As(r)=4.36	Mu=28.33 As =5.97 As(r)=4.36
Vu=-27.00	Vu=6.00	Vu=31.00	Vu=-51.00	Vu=8.00	Vu=66.00

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=1.90		
Mu=-83.00 As =5.97 As(r)=5.13	Mu=-23.80 As =11.94 As(r)=4.36	Mu=-119.00 As =9.41 As(r)=7.45	Mu=-100.00 As =9.41 As(r)=6.22	Mu=-34.00 As =9.41 As(r)=4.36	Mu=-11.00 As =9.41 As(r)=4.36
Mu=27.67 As =9.45 As(r)=4.36	Mu=73.00 As =5.97 As(r)=4.50	Mu=39.67 As =5.97 As(r)=4.36	Mu=20.00 As =5.97 As(r)=4.36	Mu=0.00 As =5.97 As(r)=4.36	Mu=5.00 As =5.97 As(r)=4.36
Vu=-85.00	Vu=6.00	Vu=94.00	Vu=-68.00	Vu=-43.00	Vu=-18.00

VSC-07(3)/Roof

B=0.30 H=0.50 L=1.90			B=0.30 H=0.50 L=4.49		
Mu=-7.00 As =5.97 As(r)=4.36	Mu=-32.00 As =9.23 As(r)=4.36	Mu=-109.00 As =9.41 As(r)=6.80	Mu=-98.00 As =9.41 As(r)=6.09	Mu=-19.60 As =11.94 As(r)=4.36	Mu=-60.00 As =5.97 As(r)=4.36
Mu=15.00 As =5.97 As(r)=4.36	Mu=0.00 As =5.97 As(r)=4.36	Mu=21.80 As =5.97 As(r)=4.36	Mu=32.67 As =5.97 As(r)=4.36	Mu=19.60 As =5.97 As(r)=4.36	Mu=20.00 As =5.97 As(r)=4.36
Vu=26.00	Vu=52.00	Vu=77.00	Vu=-65.00	Vu=-10.00	Vu=53.00

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=1.90		
Mu=-96.00 As =5.97 As(r)=5.96	Mu=-20.00 As =11.94 As(r)=4.36	Mu=-100.00 As =9.41 As(r)=6.22	Mu=-83.00 As =9.41 As(r)=5.13	Mu=-30.00 As =9.41 As(r)=4.36	Mu=-22.00 As =9.41 As(r)=4.36
Mu=32.00 As =9.45 As(r)=4.36	Mu=80.00 As =5.97 As(r)=4.94	Mu=33.33 As =5.97 As(r)=4.36	Mu=27.67 As =5.97 As(r)=4.36	Mu=16.60 As =5.97 As(r)=4.36	Mu=16.60 As =5.97 As(r)=4.36
Vu=-91.00	Vu=3.00	Vu=91.00	Vu=-59.00	Vu=-33.00	Vu=-9.00

VSC-07(4)/Roof

B=0.30 H=0.50 L=1.90			B=0.30 H=0.50 L=4.49		
Mu=-36.00 As =5.97 As(r)=4.36	Mu=-22.00 As =9.23 As(r)=4.36	Mu=-39.00 As =9.41 As(r)=4.36	Mu=-70.00 As =9.41 As(r)=4.36	Mu=-14.00 As =11.94 As(r)=4.36	Mu=-67.00 As =5.97 As(r)=4.36
Mu=7.80 As =5.97 As(r)=4.36	Mu=7.80 As =5.97 As(r)=4.36	Mu=13.00 As =5.97 As(r)=4.36	Mu=23.33 As =5.97 As(r)=4.36	Mu=14.00 As =5.97 As(r)=4.36	Mu=22.33 As =5.97 As(r)=4.36
Vu=-27.00	Vu=4.00	Vu=29.00	Vu=-59.00	Vu=-2.00	Vu=58.00

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B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=1.90		
Mu=-82.00 As =5.97 As(r)=5.07	Mu=-19.80 As =11.94 As(r)=4.36	Mu=-99.00 As =9.41 As(r)=6.15	Mu=-51.00 As =9.41 As(r)=4.36	Mu=-33.00 As =9.41 As(r)=4.36	Mu=-48.00 As =9.41 As(r)=4.36
Mu=27.33 As =9.45 As(r)=4.36	Mu=83.00 As =5.97 As(r)=5.13	Mu=33.00 As =5.97 As(r)=4.36	Mu=17.00 As =5.97 As(r)=4.36	Mu=10.20 As =5.97 As(r)=4.36	Mu=10.20 As =5.97 As(r)=4.36
Vu=-88.00	Vu=4.00	Vu=92.00	Vu=-29.00	Vu=-3.00	Vu=27.00

VSC-08/Roof

B=0.30 H=0.50 L=1.90			B=0.30 H=0.50 L=4.49		
Mu=-20.00 As =5.97 As(r)=4.36	Mu=-10.00 As =5.97 As(r)=4.36	Mu=-26.00 As =5.97 As(r)=4.36	Mu=-21.60 As =5.97 As(r)=4.36	Mu=-21.60 As =11.94 As(r)=4.36	Mu=-108.00 As =9.41 As(r)=6.74
Mu=5.20 As =5.97 As(r)=4.36	Mu=5.20 As =5.97 As(r)=4.36	Mu=8.67 As =5.97 As(r)=4.36	Mu=35.00 As =5.97 As(r)=4.36	Mu=21.60 As =5.97 As(r)=4.36	Mu=36.00 As =5.97 As(r)=4.36
Vu=-15.00	Vu=11.00	Vu=21.00	Vu=7.00	Vu=29.00	Vu=50.00

B=0.30 H=0.50 L=7.21			B=0.30 H=0.50 L=1.90		
Mu=-101.00 As =9.41 As(r)=6.28	Mu=-20.20 As =11.94 As(r)=4.36	Mu=-20.20 As =5.97 As(r)=4.36	Mu=-15.00 As =5.97 As(r)=4.36	Mu=-9.00 As =5.97 As(r)=4.36	Mu=-15.00 As =5.97 As(r)=4.36
Mu=33.67 As =9.45 As(r)=4.36	Mu=27.90 As =5.97 As(r)=4.36	Mu=20.20 As =5.97 As(r)=4.36	Mu=5.00 As =5.97 As(r)=4.36	Mu=3.00 As =5.97 As(r)=4.36	Mu=3.00 As =5.97 As(r)=4.36
Vu=-48.00	Vu=-14.00	Vu=24.00	Vu=-12.00	Vu=5.00	Vu=15.00

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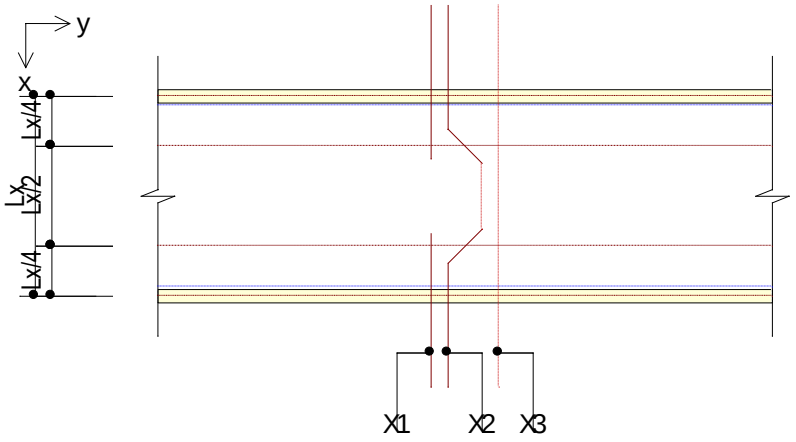
15.1.3 DISEÑO DE LOSA DE ENTREPISO

General Information

Design Code	Unit System	Span	THK.	F'_c	F_y
ACI318-14	lbf, in	5.774ft	4.921in	3,983psi	59,738psi

Design Load & Support Condition

Dead Load	Live Load	Slab Type	Support Type
0.143kip/ft²	0.0410kip/ft²	1-Way Slab	Support Case-1



Check Thickness & Deflection

Check Items	Input	Criteria	Ratio
Required minimum thickness (in)	4.921	3.465	0.704

Check Moment & Shear Capacity

Check Items	TOP	MIDDLE	BOTTOM
Bar-1	#3@23.62	-	#3@23.62
Bar-2	#3@23.62	#3@23.62	#3@23.62
Bar-3	#3@23.62	#3@23.62	#3@23.62
M_u (kip·in/ft)	3.961	11.88	3.961
V_u (kip/ft)	0.686	0.000	0.686
$øM_n$ (kip·in/ft)	20.85	20.85	20.85
$øV_n$ (kip/ft)	4.036	4.036	4.036
M_u / $øM_n$	0.190	0.570	0.190
V_u / $øV_n$	0.170	0.000	0.170
$s_{bar.req}$ (in)	12.05	12.05	12.05
s_{bar} / $s_{bar.req}$	0.980	0.980	0.980

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15.1.4 DISEÑO DE ESCALERAS

Escalera de Concreto Reforzado.

1. General Information

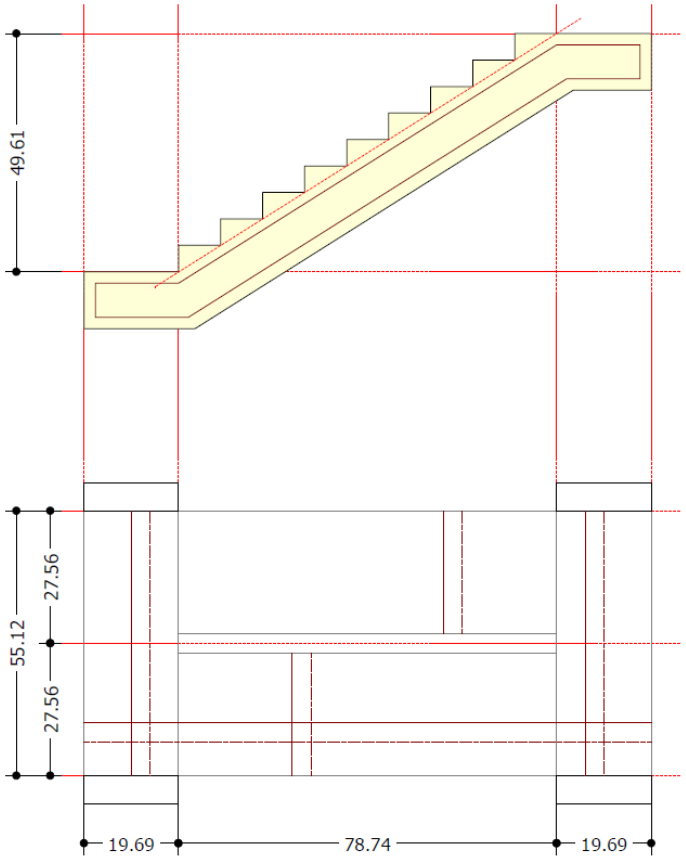
Design Code	Unit System	F'_c	F_y	F_{ys}
ACI318-14	lbf,in	3,485psi	59,738psi	58,015psi

2. Design Load & Support Condition

Design Load			Support		
DL_{stair}	$DL_{landing}$	LL	Type	Left	Right
0.125kip/ft²	0.104kip/ft²	0.0627kip/ft²	By Landing	Pin(0.000)	Pin(0.000)

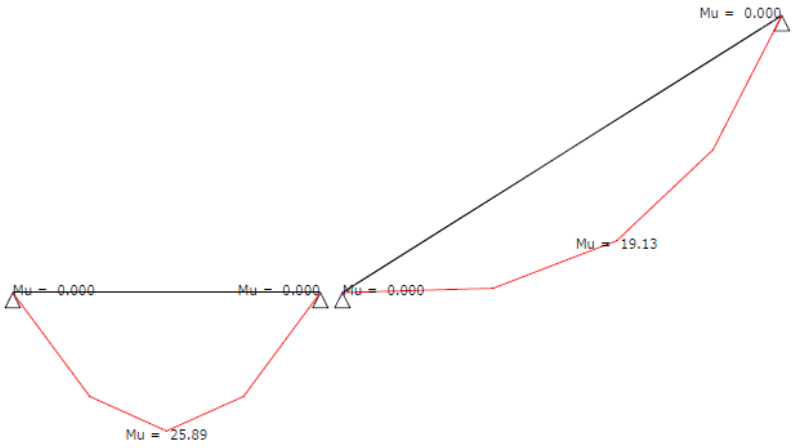
3. Section

Thickness			Length			Size	
Stair	Landing	Cover	Landing(L)	Landing(R)	Stair	Height	Width
5.906in	5.906in	1.181in	1.640ft	1.640ft	6.562ft	4.134ft	4.593ft

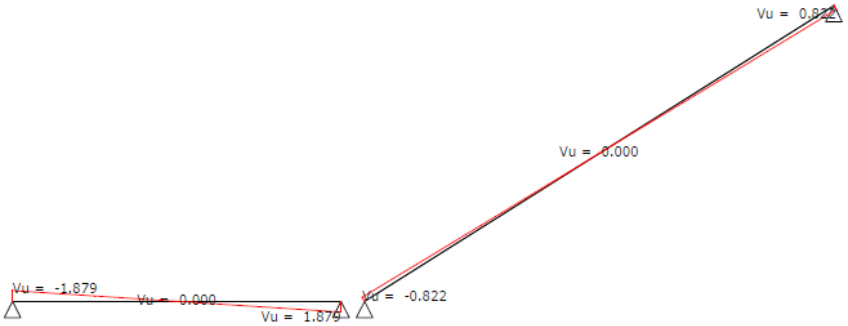


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4. Moment Diagram



5. Shear Force Diagram



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6. Check Stair

(1) Moment Capacity

Rebar	Land(L)	Stair	Land(R)	Min. Land	Min. Stair
M_u (kip·in/in)	25.89	19.13	25.89	ρ = 0.00180	ρ = 0.00180
#3	@12.19	@16.58	@12.19	@18.00(12.05)	@18.00(12.05)
#3+4	@16.93	@18.00	@16.93	@18.00(12.05)	@18.00(12.05)
#4	@18.00	@18.00	@18.00	@18.00(12.05)	@18.00(12.05)
#4+5	@18.00	@18.00	@18.00	@18.00(12.05)	@18.00(12.05)
#5	@18.00	@18.00	@18.00	@18.00(12.05)	@18.00(12.05)

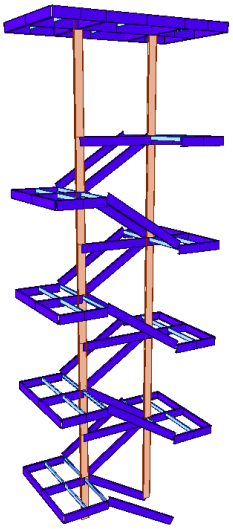
(2) Shear Capacity

-	Land(L)	Stair	Land(R)
V_u (kip/in)	-1.879	-0.822	1.879
$øV_n$ (kip/in)	4.622	4.622	4.622
V_u / $øV_n$	0.406	0.178	0.406

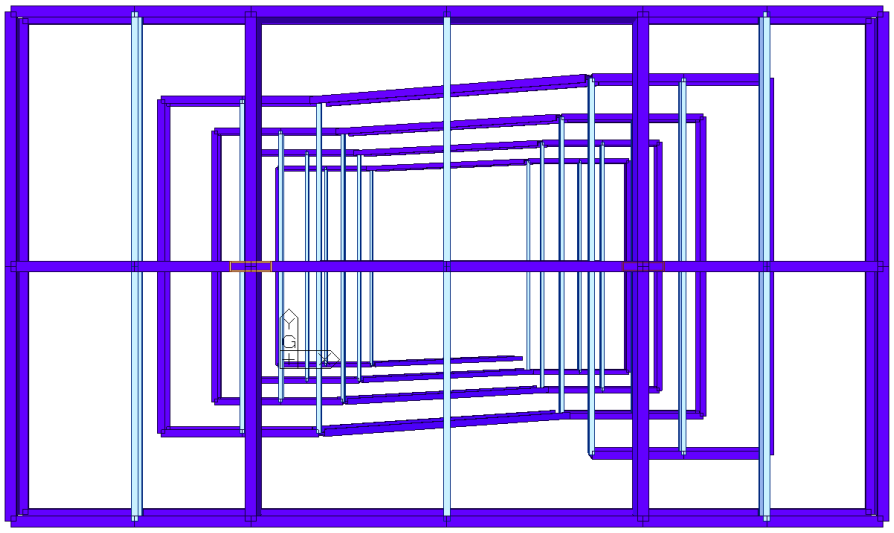
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Escalera en Estructura Metalica



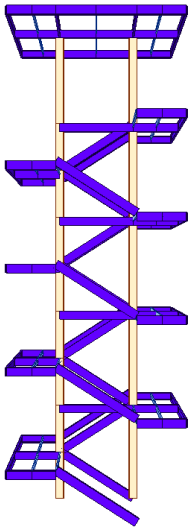
Modelo Isometrico Escalera Metalica



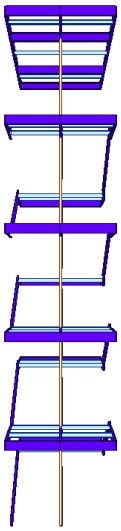
Vista en Planta Escalera Metalica

Lo Amador, Calle Real No 32 – 107, Tel. (5) 6660836 - Cel. 312-6447907, E-MAIL walbertorivera@yahoo.es
Cartagena, Colombia.

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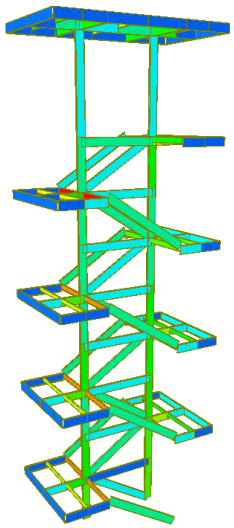


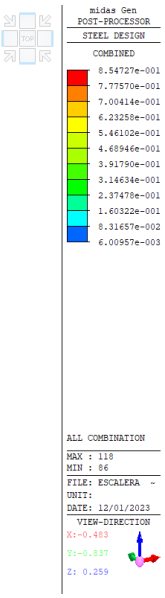
Vista Lateral Escalera Metalica



Vista Frontal Escalera Metalica

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*** PROJECT INFORMATION

Project Name :

Date : 2023/12/1

*** CONTROL DATA

Panel Zone Effect : Do not Calculate

Unit System : TONF, M

Definition of Frame

- X Direction of Frame : Braced I Non-sway
- Y Direction of Frame : Braced I Non-sway
- Design Type : 3-D

Design Code

- Steel : AISC(15th)-LRFD16
- Concrete : NSR-10
- SRC : SSRC79

*** LOAD CASE DATA

NO	NAME	TYPE	SELF WEIGHT FACTOR X	Y	Z	DESCRIPTION
1	PP	D	0.000	0.000	-1.000	Peso Propio
2	SCP	D	0.000	0.000	0.000	Sobre Carga Permanente
3	CV	L	0.000	0.000	0.000	Carga Viva

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*** MATERIAL PROPERTY DATA

NO	NAME	TYPE	MODULUS OF ELASTICITY	SHEAR MODULUS	THERMAL COEFF.	POISSON RATIO	WEIGHT DENSITY
1	A572-50	STEEL	2.039e+007	7.842e+006	6.5e-006	0.3	7.861

NO	NAME	TYPE	STRENGTH OF DESIGN MATERIAL			
			STEEL	CONCRETE	MAIN REBAR	SUB REBAR
1	A572-50	STEEL	3.515e+004	-	-	-

*** NODE DATA

NO	X	Y	Z	TEMPERATURE
1	0	0	1.8	0
2	0	3.655	1.8	0
3	0.889	0	1.8	0
4	0.889	3.655	1.8	0
5	1.725	0	1.8	0
6	1.725	3.655	1.8	0
7	0	1.828	1.8	0
8	1.725	1.828	1.8	0
9	0.889	1.828	1.8	0
10	1.725	1.828	0	0
11	4.541	0	0	0
13	4.541	1.828	0	0
38	4.541	1.828	3.6	0
39	4.541	3.655	3.6	0
40	4.541	0	3.6	0
41	5.43	0	3.6	0
42	6.266	0	3.6	0
43	6.266	3.655	3.6	0
44	5.43	3.655	3.6	0
45	6.266	1.828	3.6	0
46	5.43	1.828	3.6	0
47	0	3.655	5.4	0
48	0	1.828	5.4	0
49	0	0	5.4	0
50	0.889	0	5.4	0
51	1.725	0	5.4	0
52	1.725	3.655	5.4	0
53	0.889	3.655	5.4	0
54	1.725	1.828	5.4	0
55	0.889	1.828	5.4	0
56	4.541	3.655	7.2	0
57	4.541	1.828	7.2	0
58	4.541	0	7.2	0
59	5.43	0	7.2	0
60	6.266	0	7.2	0
61	6.266	3.655	7.2	0
62	5.43	3.655	7.2	0
63	6.266	1.828	7.2	0
64	5.43	1.828	7.2	0
65	0	3.655	9	0
66	0	1.828	9	0
67	0	0	9	0
68	0.889	0	9	0

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69	1.725	0	9	0
70	1.725	3.655	9	0
71	0.889	3.655	9	0
72	1.725	1.828	9	0
73	0.889	1.828	9	0
74	4.541	3.655	10.8	0
75	4.541	1.828	10.8	0
76	4.541	0	10.8	0
77	5.43	0	10.8	0
78	6.266	0	10.8	0
79	6.266	3.655	10.8	0
80	5.43	3.655	10.8	0
81	6.266	1.828	10.8	0
82	5.43	1.828	10.8	0
83	0	3.655	12.6	0
84	0	1.828	12.6	0
85	0	0	12.6	0
86	0.889	0	12.6	0
87	1.725	0	12.6	0
88	1.725	3.655	12.6	0
89	0.889	3.655	12.6	0
90	1.725	1.828	12.6	0
91	0.889	1.828	12.6	0
92	4.541	3.655	14.4	0
93	4.541	1.828	14.4	0
94	4.541	0	14.4	0
95	5.43	0	14.4	0
96	6.266	0	14.4	0
97	6.266	3.655	14.4	0
98	5.43	3.655	14.4	0
99	6.266	1.828	14.4	0
100	5.43	1.828	14.4	0
101	0	3.655	18	0
102	0	1.828	18	0
103	0	0	18	0
104	0.889	0	18	0
105	1.725	0	18	0
106	1.725	3.655	18	0
107	0.889	3.655	18	0
108	1.725	1.828	18	0
109	0.889	1.828	18	0
110	4.541	3.655	18	0
111	4.541	1.828	18	0
112	4.541	0	18	0
113	5.43	0	18	0
114	6.266	0	18	0
115	6.266	3.655	18	0
116	5.43	3.655	18	0
117	6.266	1.828	18	0
118	5.43	1.828	18	0
119	3.133	0	18	0
120	3.133	3.655	18	0
121	3.133	1.828	18	0
122	1.725	1.828	14.4	0
123	1.725	1.828	10.8	0
124	1.725	1.828	7.2	0
125	1.725	1.828	3.6	0
126	4.541	1.828	1.8	0
127	4.541	1.828	5.4	0
128	4.541	1.828	9	0
129	4.541	1.828	12.6	0

*** SUPPORT / SPECIFIED DISPLACEMENT / POINT SPRING SUPPORT

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** SUPPORT / SPECIFIED DISPLACEMENT

NODE	SUPPORT	SPECIFIED DISPLACEMENT					
	DDDRRR	Dx	Dy	Dz	Rx	Ry	Rz
10	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13	111111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*** SECTION PROPERTY DATA

NO	NAME	SHAPE	H	B	tw	tf1	r1
1	Cajón en ~	B	0.305	0.077	0.0098	0.0098	0
2	C6X8.2	C	0.152	0.0488	0.00508	0.00871	0
3	C12X25	C	0.305	0.0775	0.00983	0.0127	0
4	C8X11.5	C	0.203	0.0574	0.00559	0.00991	0

NO	NAME	STIFFNESS SCALE FACTOR							
		A	Asy	Asz	Ix	Iy	Iz	W	Boundary Group
1	Cajón en ~								
2	C6X8.2								
3	C12X25								
4	C8X11.5								

NO	NAME	AREA	MOMENT OF INERTIA			SHAPE FACTOR	
		[SRC:EQIV.]	Ix	Iy	Iz	k-Y	k-Z
1	Cajón en ~	0.007103	2.128e-005	7.086e-005	7.106e-006	0.2125	0.8416
2	C6X8.2	0.001542	3.063e-008	5.453e-006	2.86e-007	0.4592	0.5021
3	C12X25	0.004735	2.239e-007	5.994e-005	1.852e-006	0.347	0.6327
4	C8X11.5	0.002174	5.411e-008	1.353e-005	5.453e-007	0.4359	0.5223

NO	NAME	SECTION MODULUS Sy		SECTION MODULUS Sz	
		I or CONC.	J or STEEL	I or CONC.	J or STEEL
1	Cajón en ~	0.0004647	0.0004647	0.0001846	0.0001846
2	C6X8.2	7.128e-005	7.128e-005	7.997e-006	7.997e-006
3	C12X25	0.0003933	0.0003933	3.064e-005	3.064e-005
4	C8X11.5	0.0001334	0.0001334	1.27e-005	1.27e-005

*** BEAM MEMBER DATA

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NO	NODAL CONNECTIVITY I	J	BEAM END RELEASE I	J	MATERIAL	SECTION	LENGTH
1	2	7	-	-	A572-50	C12X25	1.828
2	1	3	-	-	A572-50	C12X25	0.889
3	3	5	-	-	A572-50	C12X25	0.836
4	6	4	-	-	A572-50	C12X25	0.836
5	4	2	-	-	A572-50	C12X25	0.889
6	5	8	-	-	A572-50	C8X11.5	1.828
7	4	9	-	-	A572-50	C6X8.2	1.828
8	7	1	-	-	A572-50	C12X25	1.828
9	8	6	-	-	A572-50	C8X11.5	1.828
10	9	3	-	-	A572-50	C6X8.2	1.828
11	7	9	-	-	A572-50	C12X25	0.889
12	9	8	-	-	A572-50	C12X25	0.836
13	10	8	-	-	A572-50	Cajón en C 12x~	1.8
14	5	11	-	-	A572-50	C12X25	3.342
16	8	13	-	-	A572-50	C12X25	3.342
41	13	126	-	-	A572-50	Cajón en C 12x~	1.8
42	39	38	-	-	A572-50	C8X11.5	1.828
43	40	41	-	-	A572-50	C12X25	0.889
44	41	42	-	-	A572-50	C12X25	0.836
45	43	44	-	-	A572-50	C12X25	0.836
46	44	39	-	-	A572-50	C12X25	0.889
47	42	45	-	-	A572-50	C12X25	1.828
48	44	46	-	-	A572-50	C6X8.2	1.828
49	38	40	-	-	A572-50	C8X11.5	1.828
50	45	43	-	-	A572-50	C12X25	1.828
51	46	41	-	-	A572-50	C6X8.2	1.828
53	8	38	-	-	A572-50	C12X25	3.342
55	38	46	-	-	A572-50	C12X25	0.889
56	46	45	-	-	A572-50	C12X25	0.836
57	47	48	-	-	A572-50	C12X25	1.828
58	49	50	-	-	A572-50	C12X25	0.889
59	50	51	-	-	A572-50	C12X25	0.836
60	52	53	-	-	A572-50	C12X25	0.836
61	53	47	-	-	A572-50	C12X25	0.889
62	51	54	-	-	A572-50	C8X11.5	1.828
63	53	55	-	-	A572-50	C6X8.2	1.828
64	48	49	-	-	A572-50	C12X25	1.828
65	54	52	-	-	A572-50	C8X11.5	1.828
66	55	50	-	-	A572-50	C6X8.2	1.828
67	48	55	-	-	A572-50	C12X25	0.889
68	55	54	-	-	A572-50	C12X25	0.836
69	56	57	-	-	A572-50	C8X11.5	1.828
70	58	59	-	-	A572-50	C12X25	0.889
71	59	60	-	-	A572-50	C12X25	0.836
72	61	62	-	-	A572-50	C12X25	0.836
73	62	56	-	-	A572-50	C12X25	0.889
74	60	63	-	-	A572-50	C12X25	1.828
75	62	64	-	-	A572-50	C6X8.2	1.828
76	57	58	-	-	A572-50	C8X11.5	1.828
77	63	61	-	-	A572-50	C12X25	1.828
78	64	59	-	-	A572-50	C6X8.2	1.828
79	57	64	-	-	A572-50	C12X25	0.889
80	64	63	-	-	A572-50	C12X25	0.836
81	51	40	-	-	A572-50	C12X25	3.342
82	54	38	-	-	A572-50	C12X25	3.342
83	56	52	-	-	A572-50	C12X25	3.342
84	54	57	-	-	A572-50	C12X25	3.342
85	65	66	-	-	A572-50	C12X25	1.828
86	67	68	-	-	A572-50	C12X25	0.889
87	68	69	-	-	A572-50	C12X25	0.836
88	70	71	-	-	A572-50	C12X25	0.836
89	71	65	-	-	A572-50	C12X25	0.889
90	69	72	-	-	A572-50	C8X11.5	1.828
91	71	73	-	-	A572-50	C6X8.2	1.828
92	66	67	-	-	A572-50	C12X25	1.828

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93	72	70	-	-	A572-50	C8X11.5	1.828
94	73	68	-	-	A572-50	C6X8.2	1.828
95	66	73	-	-	A572-50	C12X25	0.889
96	73	72	-	-	A572-50	C12X25	0.836
97	74	75	-	-	A572-50	C8X11.5	1.828
98	76	77	-	-	A572-50	C12X25	0.889
99	77	78	-	-	A572-50	C12X25	0.836
100	79	80	-	-	A572-50	C12X25	0.836
101	80	74	-	-	A572-50	C12X25	0.889
102	78	81	-	-	A572-50	C12X25	1.828
103	80	82	-	-	A572-50	C6X8.2	1.828
104	75	76	-	-	A572-50	C8X11.5	1.828
105	81	79	-	-	A572-50	C12X25	1.828
106	82	77	-	-	A572-50	C6X8.2	1.828
107	75	82	-	-	A572-50	C12X25	0.889
108	82	81	-	-	A572-50	C12X25	0.836
109	69	58	-	-	A572-50	C12X25	3.342
110	72	57	-	-	A572-50	C12X25	3.342
111	74	70	-	-	A572-50	C12X25	3.342
112	72	75	-	-	A572-50	C12X25	3.342
113	83	84	-	-	A572-50	C12X25	1.828
114	85	86	-	-	A572-50	C12X25	0.889
115	86	87	-	-	A572-50	C12X25	0.836
116	88	89	-	-	A572-50	C12X25	0.836
117	89	83	-	-	A572-50	C12X25	0.889
118	87	90	-	-	A572-50	C8X11.5	1.828
119	89	91	-	-	A572-50	C6X8.2	1.828
120	84	85	-	-	A572-50	C12X25	1.828
121	90	88	-	-	A572-50	C8X11.5	1.828
122	91	86	-	-	A572-50	C6X8.2	1.828
123	84	91	-	-	A572-50	C12X25	0.889
124	91	90	-	-	A572-50	C12X25	0.836
125	92	93	-	-	A572-50	C8X11.5	1.828
126	94	95	-	-	A572-50	C12X25	0.889
127	95	96	-	-	A572-50	C12X25	0.836
128	97	98	-	-	A572-50	C12X25	0.836
129	98	92	-	-	A572-50	C12X25	0.889
130	96	99	-	-	A572-50	C12X25	1.828
131	98	100	-	-	A572-50	C6X8.2	1.828
132	93	94	-	-	A572-50	C8X11.5	1.828
133	99	97	-	-	A572-50	C12X25	1.828
134	100	95	-	-	A572-50	C6X8.2	1.828
135	93	100	-	-	A572-50	C12X25	0.889
136	100	99	-	-	A572-50	C12X25	0.836
137	87	76	-	-	A572-50	C12X25	3.342
138	90	75	-	-	A572-50	C12X25	3.342
139	92	88	-	-	A572-50	C12X25	3.342
140	90	93	-	-	A572-50	C12X25	3.342
141	101	102	-	-	A572-50	C12X25	1.828
142	103	104	-	-	A572-50	C12X25	0.889
143	104	105	-	-	A572-50	C12X25	0.836
144	106	107	-	-	A572-50	C12X25	0.836
145	107	101	-	-	A572-50	C12X25	0.889
146	105	108	-	-	A572-50	C12X25	1.828
147	107	109	-	-	A572-50	C6X8.2	1.828
148	102	103	-	-	A572-50	C12X25	1.828
149	108	106	-	-	A572-50	C12X25	1.828
150	109	104	-	-	A572-50	C6X8.2	1.828
151	102	109	-	-	A572-50	C12X25	0.889
152	109	108	-	-	A572-50	C12X25	0.836
167	39	6	-	-	A572-50	C12X25	3.342
168	38	127	-	-	A572-50	Cajón en C 12x~	1.8
169	57	128	-	-	A572-50	Cajón en C 12x~	1.8
170	75	129	-	-	A572-50	Cajón en C 12x~	1.8
171	8	125	-	-	A572-50	Cajón en C 12x~	1.8
172	54	124	-	-	A572-50	Cajón en C 12x~	1.8
173	72	123	-	-	A572-50	Cajón en C 12x~	1.8
174	90	122	-	-	A572-50	Cajón en C 12x~	1.8
175	110	111	-	-	A572-50	C12X25	1.828
176	112	113	-	-	A572-50	C12X25	0.889
177	113	114	-	-	A572-50	C12X25	0.836

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178	115	116	-	-	A572-50	C12X25	0.836
179	116	110	-	-	A572-50	C12X25	0.889
180	114	117	-	-	A572-50	C12X25	1.828
181	116	118	-	-	A572-50	C6X8.2	1.828
182	111	112	-	-	A572-50	C12X25	1.828
183	117	115	-	-	A572-50	C12X25	1.828
184	118	113	-	-	A572-50	C6X8.2	1.828
185	111	118	-	-	A572-50	C12X25	0.889
186	118	117	-	-	A572-50	C12X25	0.836
187	93	111	-	-	A572-50	Cajón en C 12x~	3.6
188	106	120	-	-	A572-50	C12X25	1.408
189	105	119	-	-	A572-50	C12X25	1.408
190	108	121	-	-	A572-50	C12X25	1.408
191	119	121	-	-	A572-50	C6X8.2	1.828
192	121	120	-	-	A572-50	C6X8.2	1.828
193	119	112	-	-	A572-50	C12X25	1.408
194	121	111	-	-	A572-50	C12X25	1.408
195	120	110	-	-	A572-50	C12X25	1.408
197	122	108	-	-	A572-50	Cajón en C 12x~	3.6
198	122	93	-	-	A572-50	C12X25	2.816
199	123	75	-	-	A572-50	C12X25	2.816
200	123	90	-	-	A572-50	Cajón en C 12x~	1.8
201	124	57	-	-	A572-50	C12X25	2.816
202	124	72	-	-	A572-50	Cajón en C 12x~	1.8
203	125	38	-	-	A572-50	C12X25	2.816
204	125	54	-	-	A572-50	Cajón en C 12x~	1.8
205	11	13	-	-	A572-50	C6X8.2	1.828
206	8	126	-	-	A572-50	C12X25	2.816
207	126	38	-	-	A572-50	Cajón en C 12x~	1.8
208	54	127	-	-	A572-50	C12X25	2.816
209	127	57	-	-	A572-50	Cajón en C 12x~	1.8
210	72	128	-	-	A572-50	C12X25	2.816
211	128	75	-	-	A572-50	Cajón en C 12x~	1.8
212	90	129	-	-	A572-50	C12X25	2.816
213	129	93	-	-	A572-50	Cajón en C 12x~	1.8

*** TOTAL WEIGHT / VOLUME / SURFACE AREA SUMMARY

SECTION NO	SECION NAME	SURFACE AREA	VOLUME	WEIGHT	FRAME NUMBER	TRUSS NUMBER
1	Cajón en C 12x~	52.19	0.2557	2.01	18	0
2	C6X8.2	20.58	0.06481	0.5095	23	0
3	C12X25	162	0.8527	6.703	114	0
4	C8X11.5	18.27	0.06357	0.4998	16	0

*** LOAD DATA

; Self Weight, Nodal Load, Specified Displacement, Beam Load, Floor Load, Finishing Material Load,
System Temperature, Nodal Temperature, Element Temperature, Beam Section Temperature,
Wind Load, Static Seismic Load, Time History Analysis Data

** FLOOR LOAD TYPE DATA

NAME	LOADCASE	LOAD	SUB-BEAM

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NAME			WEIGHT
Descanso	SCP	-0.1	Consider
	CV	-0.3	Do not consider
Peldaños	SCP	-0.1	Consider
	CV	-0.3	Do not consider
Cubierta	SCP	-0.4	Consider
	CV	-0.18	Do not consider

** FLOOR LOAD DATA

LOAD TYPE	DISTRIBUTION	DIR.	PROJ	SUB-BEAM			NODE LIST
				NUMBER	ANGLE	UNIT-W	
Peldaños	One Way	GZ	NO	0	0	0	90 88 92 93
Descanso	One Way	GZ	NO	0	0	0	51 49 47 52
Cubierta	One Way	GZ	NO	0	0	0	103 114 115 101
Peldaños	One Way	GZ	NO	0	0	0	75 76 87 90
Descanso	One Way	GZ	NO	0	0	0	40 42 43 39
Descanso	One Way	GZ	NO	0	0	0	96 94 92 97
Peldaños	One Way	GZ	NO	0	0	0	57 58 69 72
Descanso	One Way	GZ	NO	0	0	0	5 1 2 6
Descanso	One Way	GZ	NO	0	0	0	87 85 83 88
Peldaños	One Way	GZ	NO	0	0	0	38 40 51 54
Peldaños	One Way	GZ	NO	0	0	0	8 6 39 38
Descanso	One Way	GZ	NO	0	0	0	76 78 79 74
Peldaños	One Way	GZ	NO	0	0	0	13 11 5 8
Peldaños	One Way	GZ	NO	0	0	0	54 52 56 57
Descanso	One Way	GZ	NO	0	0	0	58 60 61 56
Peldaños	One Way	GZ	NO	0	0	0	72 70 74 75
Descanso	One Way	GZ	NO	0	0	0	69 67 65 70

[LOAD CASE : PP]

** SELF WEIGHT DATA

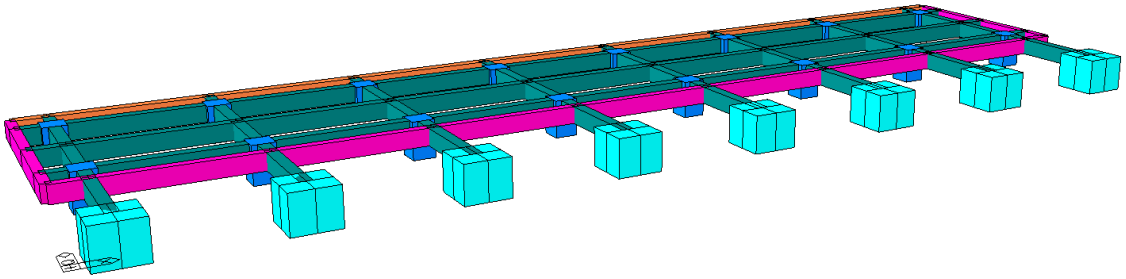
; X=0, Y=0, Z=-1

*** LOAD COMBINATION DATA

** STEEL DESIGN

NO	NAME	TYPE	ACTIVE	DESCRIPTION
1	sLCB1	Add	ACTIVE	1.4D
2	sLCB2	Add	ACTIVE	1.2(D) + 1.6(L)

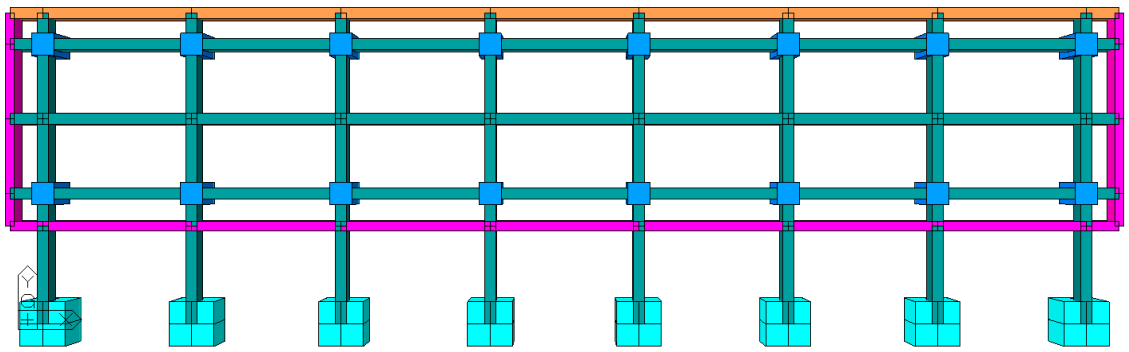
15.1.5 DISEÑO DE MUELLE



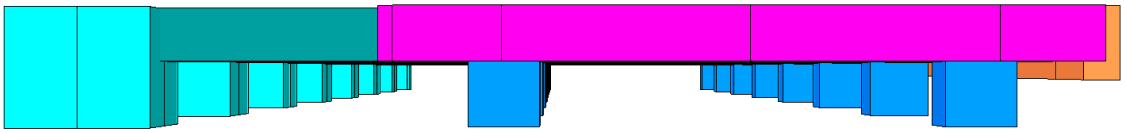
Vista Isometrica del Muelle

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Vista en Planta del Muelle



Vista Lateral del Muelle

Lo Amador, Calle Real No 32 – 107, Tel. (5) 6660836 - Cel. 312-6447907, E-MAIL walbertorivera@yahoo.es
Cartagena, Colombia.

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VM-01/Roof

B=0.30 H=0.60 L=0.60			B=0.30 H=0.60 L=3.70		
Mu=-1.10 As =8.52 As(r)=5.35	Mu=-2.20 As =8.52 As(r)=5.35	Mu=-6.60 As =8.52 As(r)=5.35	Mu=-8.80 As =8.52 As(r)=5.35	Mu=-3.52 As =8.52 As(r)=5.35	Mu=-17.60 As =8.52 As(r)=5.35
Mu=0.00 As =8.52 As(r)=5.35	Mu=0.00 As =8.52 As(r)=5.35	Mu=1.32 As =8.52 As(r)=5.35	Mu=3.52 As =8.52 As(r)=5.35	Mu=11.00 As =8.52 As(r)=5.35	Mu=5.87 As =8.52 As(r)=5.35
Vu=1.10	Vu=6.60	Vu=11.00	Vu=-22.00	Vu=2.20	Vu=26.40

B=0.30 H=0.60 L=3.70			B=0.30 H=0.60 L=3.69		
Mu=-17.60 As =8.52 As(r)=5.35	Mu=-3.52 As =8.52 As(r)=5.35	Mu=-15.40 As =8.52 As(r)=5.35	Mu=-15.40 As =8.52 As(r)=5.35	Mu=-3.30 As =15.48 As(r)=5.35	Mu=-16.50 As =8.52 As(r)=5.35
Mu=5.87 As =8.52 As(r)=5.35	Mu=7.70 As =8.52 As(r)=5.35	Mu=5.13 As =8.52 As(r)=5.35	Mu=5.13 As =8.52 As(r)=5.35	Mu=7.70 As =8.52 As(r)=5.35	Mu=5.50 As =8.52 As(r)=5.35
Vu=-24.20	Vu=0.00	Vu=23.10	Vu=-24.20	Vu=0.00	Vu=24.20

B=0.30 H=0.60 L=3.70			B=0.30 H=0.60 L=3.70		
Mu=-15.40 As =8.52 As(r)=5.35	Mu=-3.08 As =8.52 As(r)=5.35	Mu=-15.40 As =8.52 As(r)=5.35	Mu=-16.50 As =8.52 As(r)=5.35	Mu=-3.30 As =17.04 As(r)=5.35	Mu=-15.40 As =8.52 As(r)=5.35
Mu=5.13 As =8.52 As(r)=5.35	Mu=7.70 As =8.52 As(r)=5.35	Mu=5.13 As =8.52 As(r)=5.35	Mu=5.50 As =8.52 As(r)=5.35	Mu=7.70 As =8.52 As(r)=5.35	Mu=5.13 As =8.52 As(r)=5.35
Vu=-24.20	Vu=0.00	Vu=24.20	Vu=-24.20	Vu=0.00	Vu=24.20

B=0.30 H=0.60 L=3.70			B=0.30 H=0.60 L=3.70		
Mu=-15.40 As =8.52 As(r)=5.35	Mu=-3.52 As =8.52 As(r)=5.35	Mu=-17.60 As =8.52 As(r)=5.35	Mu=-17.60 As =8.52 As(r)=5.35	Mu=-3.52 As =8.52 As(r)=5.35	Mu=-8.80 As =8.52 As(r)=5.35
Mu=5.13 As =8.52 As(r)=5.35	Mu=7.70 As =8.52 As(r)=5.35	Mu=5.87 As =9.05 As(r)=5.35	Mu=5.87 As =8.52 As(r)=5.35	Mu=11.00 As =8.52 As(r)=5.35	Mu=3.52 As =8.52 As(r)=5.35
Vu=-23.10	Vu=0.00	Vu=24.20	Vu=-26.40	Vu=-2.20	Vu=22.00

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B=0.30 H=0.60 L=0.60		
Mu=-6.60 As =8.52 As(r)=5.35	Mu=-2.20 As =8.52 As(r)=5.35	Mu=-1.10 As =8.52 As(r)=5.35
Mu=1.32 As =8.52 As(r)=5.35	Mu=0.00 As =8.52 As(r)=5.35	Mu=0.00 As =8.52 As(r)=5.35
Vu=-11.00	Vu=-6.60	Vu=-1.10

VM-02/Roof

B=0.30 H=0.45 L=0.45			B=0.30 H=0.45 L=3.40		
Mu=-0.00 As =5.97 As(r)=3.86	Mu=-1.10 As =5.97 As(r)=3.86	Mu=-6.60 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86
Mu=3.30 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=1.32 As =5.97 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86
Vu=11.00	Vu=17.60	Vu=24.20	Vu=-42.90	Vu=1.10	Vu=42.90

B=0.30 H=0.45 L=3.40			B=0.30 H=0.45 L=3.39		
Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =11.71 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86
Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =6.42 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86
Vu=-42.90	Vu=0.00	Vu=42.90	Vu=-42.90	Vu=0.00	Vu=42.90

B=0.30 H=0.45 L=3.40			B=0.30 H=0.45 L=3.40		
Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =11.94 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86
Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =8.21 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86
Vu=-42.90	Vu=0.00	Vu=42.90	Vu=-42.90	Vu=0.00	Vu=42.90

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B=0.30 H=0.45 L=3.40			B=0.30 H=0.45 L=3.40		
Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86
Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =10.00 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86
Vu=-42.90	Vu=0.00	Vu=42.90	Vu=-42.90	Vu=-1.10	Vu=42.90

B=0.30 H=0.45 L=0.45		
Mu=-6.60 As =5.97 As(r)=3.86	Mu=-1.10 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86
Mu=1.32 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=3.30 As =5.97 As(r)=3.86
Vu=-24.20	Vu=-17.60	Vu=-11.00

VM-03/Roof

B=0.30 H=0.45 L=0.60			B=0.30 H=0.45 L=3.70		
Mu=-4.40 As =5.97 As(r)=3.86	Mu=-7.70 As =5.97 As(r)=3.86	Mu=-16.50 As =5.97 As(r)=3.86	Mu=-27.50 As =5.97 As(r)=3.86	Mu=-9.68 As =5.97 As(r)=3.86	Mu=-48.40 As =5.97 As(r)=3.86
Mu=0.00 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=3.30 As =5.97 As(r)=3.86	Mu=9.68 As =5.97 As(r)=3.86	Mu=29.70 As =5.97 As(r)=3.86	Mu=16.13 As =5.97 As(r)=3.86
Vu=-1.10	Vu=13.20	Vu=28.60	Vu=-61.60	Vu=5.50	Vu=72.60

B=0.30 H=0.45 L=3.70			B=0.30 H=0.45 L=3.69		
Mu=-47.30 As =5.97 As(r)=3.86	Mu=-9.46 As =5.97 As(r)=3.86	Mu=-44.00 As =5.97 As(r)=3.86	Mu=-44.00 As =5.97 As(r)=3.86	Mu=-9.02 As =11.71 As(r)=3.86	Mu=-45.10 As =5.97 As(r)=3.86
Mu=15.77 As =5.97 As(r)=3.86	Mu=22.00 As =5.97 As(r)=3.86	Mu=14.67 As =5.97 As(r)=3.86	Mu=14.67 As =5.97 As(r)=3.86	Mu=22.00 As =5.97 As(r)=3.86	Mu=15.03 As =5.97 As(r)=3.86
Vu=-68.20	Vu=-1.10	Vu=66.00	Vu=-67.10	Vu=0.00	Vu=67.10

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B=0.30 H=0.45 L=3.70			B=0.30 H=0.45 L=3.70		
Mu=-45.10 As =5.97 As(r)=3.86	Mu=-9.02 As =5.97 As(r)=3.86	Mu=-45.10 As =5.97 As(r)=3.86	Mu=-45.10 As =5.97 As(r)=3.86	Mu=-9.02 As =11.94 As(r)=3.86	Mu=-44.00 As =5.97 As(r)=3.86
Mu=15.03 As =5.97 As(r)=3.86	Mu=22.00 As =5.97 As(r)=3.86	Mu=15.03 As =5.97 As(r)=3.86	Mu=15.03 As =5.97 As(r)=3.86	Mu=22.00 As =5.97 As(r)=3.86	Mu=14.67 As =5.97 As(r)=3.86
Vu=-67.10	Vu=0.00	Vu=67.10	Vu=-67.10	Vu=0.00	Vu=67.10

B=0.30 H=0.45 L=3.70			B=0.30 H=0.45 L=3.70		
Mu=-44.00 As =5.97 As(r)=3.86	Mu=-9.46 As =5.97 As(r)=3.86	Mu=-47.30 As =5.97 As(r)=3.86	Mu=-48.40 As =5.97 As(r)=3.86	Mu=-9.68 As =5.97 As(r)=3.86	Mu=-27.50 As =5.97 As(r)=3.86
Mu=14.67 As =5.97 As(r)=3.86	Mu=22.00 As =5.97 As(r)=3.86	Mu=15.77 As =6.42 As(r)=3.86	Mu=16.13 As =5.97 As(r)=3.86	Mu=29.70 As =5.97 As(r)=3.86	Mu=9.68 As =5.97 As(r)=3.86
Vu=-66.00	Vu=1.10	Vu=68.20	Vu=-72.60	Vu=-5.50	Vu=61.60

B=0.30 H=0.45 L=0.60		
Mu=-16.50 As =5.97 As(r)=3.86	Mu=-7.70 As =5.97 As(r)=3.86	Mu=-4.40 As =5.97 As(r)=3.86
Mu=3.30 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86
Vu=-28.60	Vu=-13.20	Vu=1.10

VM-04/Roof

B=0.30 H=0.45 L=0.45			B=0.30 H=0.45 L=3.40		
Mu=-0.00 As =5.97 As(r)=3.86	Mu=-1.10 As =5.97 As(r)=3.86	Mu=-6.60 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86
Mu=3.30 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=1.32 As =5.97 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86
Vu=11.00	Vu=17.60	Vu=24.20	Vu=-42.90	Vu=1.10	Vu=42.90

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B=0.30 H=0.45 L=3.40			B=0.30 H=0.45 L=3.39		
Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =11.71 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86
Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =6.42 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86
Vu=-42.90	Vu=0.00	Vu=42.90	Vu=-42.90	Vu=0.00	Vu=42.90

B=0.30 H=0.45 L=3.40			B=0.30 H=0.45 L=3.40		
Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =11.94 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86
Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =8.21 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86
Vu=-42.90	Vu=0.00	Vu=42.90	Vu=-42.90	Vu=0.00	Vu=42.90

B=0.30 H=0.45 L=3.40			B=0.30 H=0.45 L=3.40		
Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-4.84 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86
Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =10.00 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86	Mu=12.10 As =5.97 As(r)=3.86	Mu=8.07 As =5.97 As(r)=3.86
Vu=-42.90	Vu=0.00	Vu=42.90	Vu=-42.90	Vu=-1.10	Vu=42.90

B=0.30 H=0.45 L=0.45		
Mu=-6.60 As =5.97 As(r)=3.86	Mu=-1.10 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86
Mu=1.32 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=3.30 As =5.97 As(r)=3.86
Vu=-24.20	Vu=-17.60	Vu=-11.00

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VM-05/Roof

B=0.25 H=0.45 L=0.60			B=0.25 H=0.45 L=3.70		
Mu=-1.10 As =3.98 As(r)=3.22	Mu=-2.20 As =3.98 As(r)=3.22	Mu=-5.50 As =3.98 As(r)=3.22	Mu=-8.80 As =3.98 As(r)=3.22	Mu=-2.86 As =3.98 As(r)=3.22	Mu=-14.30 As =3.98 As(r)=3.22
Mu=0.00 As =3.98 As(r)=3.22	Mu=0.00 As =3.98 As(r)=3.22	Mu=1.10 As =3.98 As(r)=3.22	Mu=2.93 As =3.98 As(r)=3.22	Mu=8.80 As =3.98 As(r)=3.22	Mu=4.77 As =3.98 As(r)=3.22
Vu=1.10	Vu=5.50	Vu=9.90	Vu=-18.70	Vu=1.10	Vu=22.00

B=0.25 H=0.45 L=3.70			B=0.25 H=0.45 L=3.69		
Mu=-14.30 As =3.98 As(r)=3.22	Mu=-2.86 As =3.98 As(r)=3.22	Mu=-13.20 As =3.98 As(r)=3.22	Mu=-13.20 As =3.98 As(r)=3.22	Mu=-2.64 As =7.81 As(r)=3.22	Mu=-13.20 As =3.98 As(r)=3.22
Mu=4.77 As =3.98 As(r)=3.22	Mu=6.60 As =3.98 As(r)=3.22	Mu=4.40 As =3.98 As(r)=3.22	Mu=4.40 As =3.98 As(r)=3.22	Mu=6.60 As =3.98 As(r)=3.22	Mu=4.40 As =3.98 As(r)=3.22
Vu=-19.80	Vu=0.00	Vu=19.80	Vu=-19.80	Vu=0.00	Vu=19.80

B=0.25 H=0.45 L=3.70			B=0.25 H=0.45 L=3.70		
Mu=-13.20 As =3.98 As(r)=3.22	Mu=-2.64 As =3.98 As(r)=3.22	Mu=-13.20 As =3.98 As(r)=3.22	Mu=-13.20 As =3.98 As(r)=3.22	Mu=-2.64 As =7.96 As(r)=3.22	Mu=-13.20 As =3.98 As(r)=3.22
Mu=4.40 As =3.98 As(r)=3.22	Mu=6.60 As =3.98 As(r)=3.22	Mu=4.40 As =3.98 As(r)=3.22	Mu=4.40 As =3.98 As(r)=3.22	Mu=6.60 As =3.98 As(r)=3.22	Mu=4.40 As =3.98 As(r)=3.22
Vu=-19.80	Vu=0.00	Vu=19.80	Vu=-19.80	Vu=0.00	Vu=19.80

B=0.25 H=0.45 L=3.70			B=0.25 H=0.45 L=3.70		
Mu=-13.20 As =3.98 As(r)=3.22	Mu=-2.86 As =3.98 As(r)=3.22	Mu=-14.30 As =3.98 As(r)=3.22	Mu=-14.30 As =3.98 As(r)=3.22	Mu=-2.86 As =3.98 As(r)=3.22	Mu=-8.80 As =3.98 As(r)=3.22
Mu=4.40 As =3.98 As(r)=3.22	Mu=6.60 As =3.98 As(r)=3.22	Mu=4.77 As =4.28 As(r)=3.22	Mu=4.77 As =3.98 As(r)=3.22	Mu=8.80 As =3.98 As(r)=3.22	Mu=2.93 As =3.98 As(r)=3.22
Vu=-19.80	Vu=0.00	Vu=19.80	Vu=-22.00	Vu=-1.10	Vu=18.70

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B=0.25 H=0.45 L=0.60		
Mu=-5.50 As =3.98 As(r)=3.22	Mu=-2.20 As =3.98 As(r)=3.22	Mu=-1.10 As =3.98 As(r)=3.22
Mu=1.10 As =3.98 As(r)=3.22	Mu=0.00 As =3.98 As(r)=3.22	Mu=0.00 As =3.98 As(r)=3.22
Vu=-9.90	Vu=-5.50	Vu=-1.10

VM-06/Roof

B=0.25 H=0.45 L=0.60			B=0.25 H=0.45 L=3.70		
Mu=-1.10 As =3.98 As(r)=3.22	Mu=-2.20 As =3.98 As(r)=3.22	Mu=-2.20 As =3.98 As(r)=3.22	Mu=-4.40 As =3.98 As(r)=3.22	Mu=-0.88 As =3.98 As(r)=3.22	Mu=-4.40 As =3.98 As(r)=3.22
Mu=0.46 As =3.98 As(r)=3.22	Mu=0.46 As =3.98 As(r)=3.22	Mu=0.73 As =3.98 As(r)=3.22	Mu=1.47 As =3.98 As(r)=3.22	Mu=4.40 As =3.98 As(r)=3.22	Mu=1.47 As =3.98 As(r)=3.22
Vu=-1.10	Vu=1.10	Vu=3.30	Vu=-8.80	Vu=1.10	Vu=8.80

B=0.25 H=0.45 L=0.55		
Mu=-3.30 As =3.98 As(r)=3.22	Mu=-3.30 As =3.98 As(r)=3.22	Mu=-3.30 As =3.98 As(r)=3.22
Mu=1.10 As =3.98 As(r)=3.22	Mu=0.68 As =3.98 As(r)=3.22	Mu=1.10 As =3.98 As(r)=3.22
Vu=-2.20	Vu=-1.21	Vu=1.10

VM-07/Roof

B=0.30 H=0.45 L=3.10			B=0.30 H=0.45 L=3.40		
Mu=-0.00 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86	Mu=-16.50 As =5.97 As(r)=3.86	Mu=-41.80 As =5.97 As(r)=5.34	Mu=-8.36 As =5.97 As(r)=3.86	Mu=-41.80 As =5.97 As(r)=5.34
Mu=0.00 As =5.97 As(r)=3.86	Mu=4.73 As =5.97 As(r)=3.86	Mu=3.30 As =5.97 As(r)=3.86	Mu=13.93 As =5.97 As(r)=3.86	Mu=40.70 As =5.97 As(r)=5.26	Mu=13.93 As =5.97 As(r)=3.86
Vu=-6.60	Vu=2.64	Vu=35.31	Vu=-51.70	Vu=-45.10	Vu=52.80

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B=0.30 H=0.45 L=0.40		
Mu=-16.50 As =5.97 As(r)=3.86	Mu=-6.60 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86
Mu=3.30 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=2.20 As =5.97 As(r)=3.86
Vu=-35.20	Vu=-34.21	Vu=-33.00

VM-08/Roof

B=0.30 H=0.45 L=3.10			B=0.30 H=0.45 L=3.40		
Mu=-0.00 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-62.70 As =5.97 As(r)=4.45	Mu=-12.76 As =5.97 As(r)=3.86	Mu=-63.80 As =5.97 As(r)=4.53
Mu=0.00 As =5.97 As(r)=3.86	Mu=5.72 As =5.97 As(r)=3.86	Mu=4.84 As =5.97 As(r)=3.86	Mu=20.90 As =5.97 As(r)=3.86	Mu=62.70 As =5.97 As(r)=4.45	Mu=21.27 As =5.97 As(r)=3.86
Vu=-7.70	Vu=1.87	Vu=48.51	Vu=-77.00	Vu=-70.40	Vu=78.10

B=0.30 H=0.45 L=0.40		
Mu=-27.50 As =5.97 As(r)=3.86	Mu=-13.20 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86
Mu=5.50 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=1.10 As =5.97 As(r)=3.86
Vu=-52.80	Vu=-51.70	Vu=-50.60

VM-09/Roof

B=0.30 H=0.45 L=3.10			B=0.30 H=0.45 L=3.40		
Mu=-0.00 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86	Mu=-23.10 As =5.97 As(r)=3.86	Mu=-60.50 As =5.97 As(r)=4.29	Mu=-12.10 As =5.97 As(r)=3.86	Mu=-60.50 As =5.97 As(r)=4.29
Mu=0.00 As =5.97 As(r)=3.86	Mu=5.83 As =5.97 As(r)=3.86	Mu=4.62 As =5.97 As(r)=3.86	Mu=20.17 As =5.97 As(r)=3.86	Mu=59.40 As =5.97 As(r)=4.21	Mu=20.17 As =5.97 As(r)=3.86
Vu=-7.70	Vu=1.87	Vu=46.31	Vu=-73.70	Vu=-67.10	Vu=74.80

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B=0.30 H=0.45 L=0.40		
Mu=-26.40 As =5.97 As(r)=3.86	Mu=-13.20 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86
Mu=5.28 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86
Vu=-49.50	Vu=-48.51	Vu=-47.30

VM-10/Roof

B=0.30 H=0.45 L=3.10			B=0.30 H=0.45 L=3.40		
Mu=-0.00 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86	Mu=-23.10 As =5.97 As(r)=3.86	Mu=-60.50 As =5.97 As(r)=4.29	Mu=-12.32 As =5.97 As(r)=3.86	Mu=-61.60 As =5.97 As(r)=4.37
Mu=0.00 As =5.97 As(r)=3.86	Mu=5.83 As =5.97 As(r)=3.86	Mu=4.62 As =5.97 As(r)=3.86	Mu=20.17 As =5.97 As(r)=3.86	Mu=59.40 As =5.97 As(r)=4.21	Mu=20.53 As =5.97 As(r)=3.86
Vu=-7.70	Vu=1.87	Vu=47.30	Vu=-74.80	Vu=-67.10	Vu=74.80

B=0.30 H=0.45 L=0.40		
Mu=-26.40 As =5.97 As(r)=3.86	Mu=-13.20 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86
Mu=5.28 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86
Vu=-50.60	Vu=-49.50	Vu=-47.30

VM-11/Roof

B=0.30 H=0.45 L=3.10			B=0.30 H=0.45 L=3.40		
Mu=-0.00 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86	Mu=-23.10 As =5.97 As(r)=3.86	Mu=-60.50 As =5.97 As(r)=4.29	Mu=-12.32 As =5.97 As(r)=3.86	Mu=-61.60 As =5.97 As(r)=4.37
Mu=0.00 As =5.97 As(r)=3.86	Mu=5.83 As =5.97 As(r)=3.86	Mu=4.62 As =5.97 As(r)=3.86	Mu=20.17 As =5.97 As(r)=3.86	Mu=59.40 As =5.97 As(r)=4.21	Mu=20.53 As =5.97 As(r)=3.86
Vu=-7.70	Vu=1.87	Vu=47.30	Vu=-74.80	Vu=-67.10	Vu=74.80

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B=0.30 H=0.45 L=0.40		
Mu=-26.40 As =5.97 As(r)=3.86	Mu=-13.20 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86
Mu=5.28 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86
Vu=-50.60	Vu=-49.50	Vu=-47.30

VM-12/Roof

B=0.30 H=0.45 L=3.10			B=0.30 H=0.45 L=3.40		
Mu=-0.00 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86	Mu=-23.10 As =5.97 As(r)=3.86	Mu=-60.50 As =5.97 As(r)=4.29	Mu=-12.10 As =5.97 As(r)=3.86	Mu=-60.50 As =5.97 As(r)=4.29
Mu=0.00 As =5.97 As(r)=3.86	Mu=5.83 As =5.97 As(r)=3.86	Mu=4.62 As =5.97 As(r)=3.86	Mu=20.17 As =5.97 As(r)=3.86	Mu=59.40 As =5.97 As(r)=4.21	Mu=20.17 As =5.97 As(r)=3.86
Vu=-7.70	Vu=1.87	Vu=46.31	Vu=-73.70	Vu=-67.10	Vu=74.80

B=0.30 H=0.45 L=0.40		
Mu=-26.40 As =5.97 As(r)=3.86	Mu=-13.20 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86
Mu=5.28 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86
Vu=-49.50	Vu=-48.51	Vu=-47.30

VM-13/Roof

B=0.30 H=0.45 L=3.10			B=0.30 H=0.45 L=3.40		
Mu=-0.00 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86	Mu=-24.20 As =5.97 As(r)=3.86	Mu=-62.70 As =5.97 As(r)=4.45	Mu=-12.76 As =5.97 As(r)=3.86	Mu=-63.80 As =5.97 As(r)=4.53
Mu=0.00 As =5.97 As(r)=3.86	Mu=5.72 As =5.97 As(r)=3.86	Mu=4.84 As =5.97 As(r)=3.86	Mu=20.90 As =5.97 As(r)=3.86	Mu=62.70 As =5.97 As(r)=4.45	Mu=21.27 As =5.97 As(r)=3.86
Vu=-7.70	Vu=1.87	Vu=48.51	Vu=-77.00	Vu=-70.40	Vu=78.10

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B=0.30 H=0.45 L=0.40		
Mu=-27.50 As =5.97 As(r)=3.86	Mu=-13.20 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86
Mu=5.50 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=1.10 As =5.97 As(r)=3.86
Vu=-52.80	Vu=-51.70	Vu=-50.60

VM-14/Roof

B=0.30 H=0.45 L=3.10			B=0.30 H=0.45 L=3.40		
Mu=-0.00 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86	Mu=-16.50 As =5.97 As(r)=3.86	Mu=-41.80 As =5.97 As(r)=5.34	Mu=-8.36 As =5.97 As(r)=3.86	Mu=-41.80 As =5.97 As(r)=5.34
Mu=0.00 As =5.97 As(r)=3.86	Mu=4.73 As =5.97 As(r)=3.86	Mu=3.30 As =5.97 As(r)=3.86	Mu=13.93 As =5.97 As(r)=3.86	Mu=40.70 As =5.97 As(r)=5.26	Mu=13.93 As =5.97 As(r)=3.86
Vu=-6.60	Vu=2.64	Vu=35.31	Vu=-51.70	Vu=-45.10	Vu=52.80

B=0.30 H=0.45 L=0.40		
Mu=-16.50 As =5.97 As(r)=3.86	Mu=-6.60 As =5.97 As(r)=3.86	Mu=-0.00 As =5.97 As(r)=3.86
Mu=3.30 As =5.97 As(r)=3.86	Mu=0.00 As =5.97 As(r)=3.86	Mu=2.20 As =5.97 As(r)=3.86
Vu=-35.20	Vu=-34.21	Vu=-33.00

VM-15/Roof

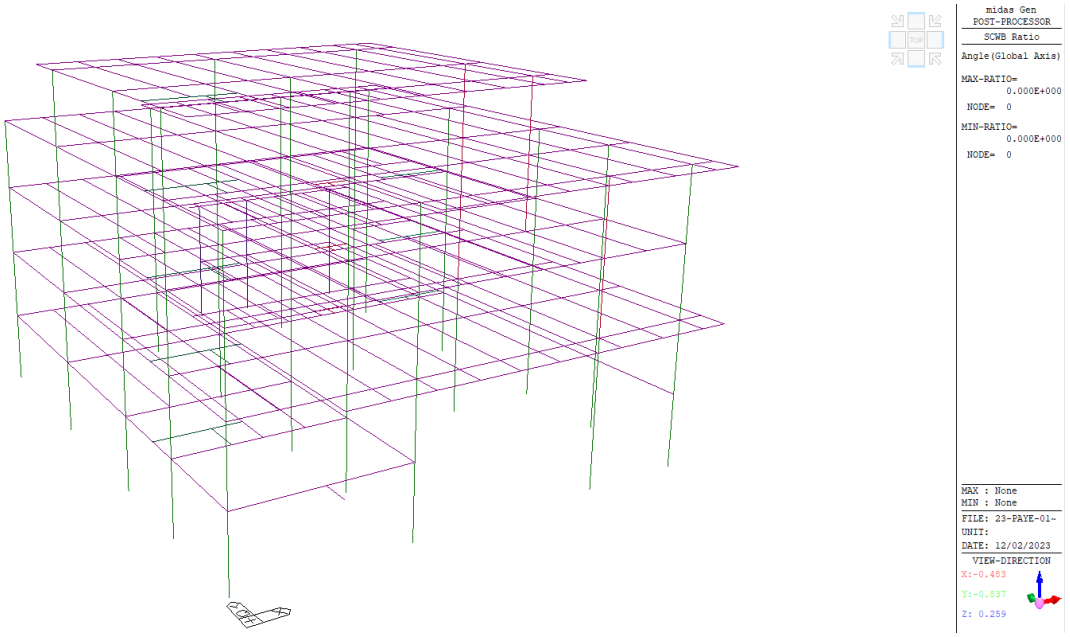
B=0.25 H=0.45 L=0.60			B=0.25 H=0.45 L=3.70		
Mu=-1.10 As =3.98 As(r)=3.22	Mu=-2.20 As =3.98 As(r)=3.22	Mu=-2.20 As =3.98 As(r)=3.22	Mu=-4.40 As =3.98 As(r)=3.22	Mu=-0.88 As =3.98 As(r)=3.22	Mu=-4.40 As =3.98 As(r)=3.22
Mu=0.46 As =3.98 As(r)=3.22	Mu=0.46 As =3.98 As(r)=3.22	Mu=0.73 As =3.98 As(r)=3.22	Mu=1.47 As =3.98 As(r)=3.22	Mu=4.40 As =3.98 As(r)=3.22	Mu=1.47 As =3.98 As(r)=3.22
Vu=-1.10	Vu=1.10	Vu=3.30	Vu=-8.80	Vu=1.10	Vu=8.80

B=0.25 H=0.45 L=0.55		
Mu=-3.30 As =3.98 As(r)=3.22	Mu=-3.30 As =3.98 As(r)=3.22	Mu=-3.30 As =3.98 As(r)=3.22
Mu=1.10 As =3.98 As(r)=3.22	Mu=0.68 As =3.98 As(r)=3.22	Mu=1.10 As =3.98 As(r)=3.22
Vu=-2.20	Vu=-1.21	Vu=1.10

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15.2 CHEQUEO COLUMNA FUERTE VIGA DEBIL

El diseño o chequeo de columna fuerte - viga débil en pórticos resistentes a momento, se realiza de acuerdo titulo C sección C.21.6.2.2 de la NSR-10, en el cual se expone que la resistencia minima a flexión de las columnas sea al menos 1.2 veces la resistencia a flexión de las vigas en un nudo. Lo anterior, se debe a que, teniendo columnas fuertes, la deriva tiende a distribuirse en toda la estructura analizada y el daño pasa de estar concentrado en un solo punto a distribuirse a las vigas, favoreciendo de forma general a la estructura porque las fallas de las vigas provocan menos consecuencias que las fallas de las columnas. A continuación, se presenta la comporbación requerida.



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Node	Column Local Axis	LCB	Column Strength (tonf*m)	Clockwise		Counter-Clockwise		Minimum Ratio	Remark
				Beam Strength (tonf*m)	Ratio	Beam Strength (tonf*m)	Ratio		
Acceptance Limit for SCWB C/B Flexural Capacity Ratio: 1.2									
Input Acceptance Limit Value and Press 'Apply' button to change value.								1.2	
Angle for Seismic Load Combination Result: 0 [Deg]									
Input Angle and Press 'Apply' button to change angle.								0	
6	Local y	cLCB21	105.862	59.9893	1.76	59.9893	1.76	1.76	OK
25	Local y	cLCB22	79.5382	46.7017	1.7	13.598	5.85	1.7	OK
26	Local y	cLCB20	91.1062	46.6627	1.95	13.637	6.68	1.95	OK
28	Local z	cLCB19	82.1776	44.3158	1.85	44.3158	1.85	1.85	OK
34	Local y	cLCB20	110.4553	63.6418	1.74	13.8521	7.97	1.74	OK
36	Local y	cLCB19	101.6814	56.2627	1.81	13.838	7.35	1.81	OK
67	Local y	cLCB22	91.4969	70.0102	1.31	61.1703	1.5	1.31	OK
68	Local y	cLCB20	122.1692	76.8729	1.59	73.8708	1.65	1.59	OK
69	Local y	cLCB21	122.2774	76.8729	1.59	76.8729	1.59	1.59	OK
70	Local y	cLCB21	141.2711	76.8729	1.84	76.8729	1.84	1.84	OK
86	Local y	cLCB20	132.4149	65.725	2.01	76.8729	1.72	1.72	OK
87	Local y	cLCB20	105.8788	59.9893	1.76	65.5838	1.61	1.61	OK
89	Local y	cLCB19	108.7419	59.9893	1.81	86.2713	1.26	1.26	OK
91	Local y	cLCB19	134.6562	65.725	2.05	83.1083	1.62	1.62	OK
96	Local y	cLCB20	76.4907	44.9366	1.7	55.6009	1.38	1.38	OK
97	Local y	cLCB20	88.702	33.3186	2.66	65.725	1.35	1.35	OK
98	Local z	cLCB20	68.1788	44.3169	1.54	38.7508	1.76	1.54	OK
99	Local y	cLCB19	93.4462	39.554	2.36	61.4409	1.52	1.52	OK
100	Local y	cLCB19	89.6797	33.0608	2.71	59.9893	1.49	1.49	OK
169	Local z	cLCB22	73.0625	38.7499	1.89	38.7499	1.89	1.89	OK
171	Local z	cLCB19	73.9854	32.4403	2.28	38.0806	1.94	1.94	OK
172	Local z	cLCB19	74.1212	38.7499	1.91	38.7499	1.91	1.91	OK
179	Local z	cLCB22	81.4502	38.7508	2.1	38.7508	2.1	2.1	OK
210	Local y	cLCB22	100.1499	50.9538	1.97	39.197	2.56	1.97	OK
211	Local z	cLCB21	83.1021	38.7508	2.14	38.7508	2.14	2.14	OK
212	Local z	cLCB21	84.399	38.7508	2.18	38.7508	2.18	2.18	OK
224	Local y	cLCB19	84.5152	33.3186	2.54	67.6763	1.25	1.25	OK
225	Local z	cLCB20	91.4946	39.1524	2.34	50.5523	1.81	1.81	OK
246	Local y	cLCB22	82.7905	44.9366	1.84	39.197	2.11	1.84	OK
258	Local y	cLCB20	89.8505	38.8004	2.32	66.1255	1.36	1.36	OK
260	Local y	cLCB19	87.44	44.9366	1.95	50.6762	1.73	1.73	OK
264	Local y	cLCB20	76.5334	25.3381	3.02	30.6811	2.49	2.49	OK
267	Local y	cLCB19	82.0647	19.5985	4.19	25.3381	3.24	3.24	OK

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Node	Column Local Axis	LCB	Column Strength (tonf*m)	Clockwise		Counter-Clockwise		Minimum Ratio	Remark
				Beam Strength (tonf*m)	Ratio	Beam Strength (tonf*m)	Ratio		
Acceptance Limit for SCWB C/B Flexural Capacity Ratio: 1.2									
Input Acceptance Limit Value and Press 'Apply' button to change value.								1.2	
Angle for Seismic Load Combination Result: 0 [Deg]									
Input Angle and Press 'Apply' button to change angle.								0	
278	Local z	cLCB22	64.5575	19.3749	3.33	19.3749	3.33	3.33	OK
279	Local z	cLCB20	77.2702	38.7499	1.99	38.7499	1.99	1.99	OK
281	Local z	cLCB19	78.1907	32.4403	2.41	38.0806	2.05	2.05	OK
282	Local y	cLCB20	97.4149	51.8359	1.88	13.8131	7.05	1.88	OK
283	Local y	cLCB20	83.724	46.6627	1.79	13.637	6.14	1.79	OK
289	Local y	cLCB20	111.5223	44.7185	2.49	71.9604	1.55	1.55	OK
297	Local y	cLCB21	91.0258	59.9893	1.52	59.9893	1.52	1.52	OK
320	Local y	cLCB22	107.6471	50.9538	2.11	39.197	2.75	2.11	OK
321	Local z	cLCB21	88.6387	38.7508	2.29	38.7508	2.29	2.29	OK
322	Local y	cLCB21	116.5486	65.106	1.79	65.106	1.79	1.79	OK
335	Local y	cLCB20	108.5249	39.197	2.77	56.8323	1.91	1.91	OK
339	Local y	cLCB20	82.4295	13.5416	6.09	47.8993	1.72	1.72	OK
340	Local z	cLCB20	65.5097	38.7508	1.69	38.7508	1.69	1.69	OK
341	Local z	cLCB19	69.5228	38.7508	1.79	32.7385	2.12	1.79	OK
492	Local y	cLCB22	99.004	19.5985	5.05	25.3381	3.91	3.91	OK
504	Local z	cLCB22	101.8721	43.4245	2.35	72.0624	1.41	1.41	OK
510	Local z	cLCB20	65.0015	19.3754	3.35	19.3754	3.35	3.35	OK
513	Local z	cLCB19	82.8079	38.3046	2.16	60.1962	1.38	1.38	OK
524	Local z	cLCB22	66.9784	24.9409	2.69	19.3749	3.46	2.69	OK
525	Local z	cLCB19	86.4193	44.3158	1.95	38.7499	2.23	1.95	OK
527	Local y	cLCB19	110.9737	56.1842	1.98	13.838	8.02	1.98	OK
528	Local y	cLCB20	125.7217	63.6418	1.98	13.8521	9.08	1.98	OK
529	Local y	cLCB20	98.2455	46.6627	2.11	13.637	7.2	2.11	OK
535	Local z	cLCB20	124.5537	52.687	2.36	13.3631	9.32	2.36	OK
543	Local y	cLCB19	122.2676	33.0608	3.7	66.1255	1.85	1.85	OK
548	Local z	cLCB20	36.2274	19.3754	1.87	19.3754	1.87	1.87	OK
551	Local y	cLCB19	49.4985	38.7508	1.28	38.7508	1.28	1.28	OK
554	Local z	cLCB22	39.3773	19.3754	2.03	24.9415	1.58	1.58	OK
566	Local z	cLCB20	109.5978	38.7508	2.83	38.7508	2.83	2.83	OK
567	Local y	cLCB21	137.9365	13.5416	10.19	51.5644	2.68	2.68	OK
568	Local y	cLCB21	166.3989	49.883	3.34	76.8729	2.16	2.16	OK
585	Local z	cLCB20	78.3644	38.7508	2.02	38.7508	2.02	2.02	OK
586	Local z	cLCB20	71.8685	38.7508	1.85	38.7508	1.85	1.85	OK
587	Local z	cLCB19	85.1945	49.4368	1.72	32.7385	2.6	1.72	OK

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ANEXO:

ELEMENTOS NO ESTRUCTURALES

PROYECTO:

ESTACIÓN DE BOMBEROS BOCAGRANDE

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DISEÑO DE ELEMENTOS NO ESTRUCTURALES

En los capítulos A.3.3 y el A.3.6, de la NSR-10 se especifica al respecto:

A.3.6.1 — GENERALIDADES — Todos los elementos estructurales deben diseñarse para los efectos de los movimientos sísmicos de diseño que actúen sobre ellos, adicionalmente a todas las cargas que los puedan afectar, tal como lo prescribe el Título B de este Reglamento.

A.3.6.1.1 — Elementos del sistema de resistencia sísmica — Solamente los elementos que pertenezcan al sistema estructural de resistencia sísmica pueden contribuir a la resistencia sísmica de la edificación y deben diseñarse de acuerdo con los requisitos propios de su material estructural y para el grado de capacidad de disipación de energía requerido, además de los requisitos adicionales dados en la presente sección.

A.3.6.1.2 — Elementos estructurales que no hacen parte del sistema de resistencia sísmica — Los elementos estructurales que no formen parte del sistema estructural de resistencia sísmica, deben investigarse con el fin de determinar si pueden mantener su capacidad de resistir cargas verticales cuando se ven sometidos a los desplazamientos horizontales y a las derivas, causados por los movimientos sísmicos de diseño, pero sólo hay necesidad de que cumplan los requisitos del grado de capacidad de disipación de energía mínimo para su material estructural. Sus anclajes y amarres al sistema de resistencia sísmica deben cumplir los requisitos dados en la presente sección y en el Capítulo A.8.

A.3.3.9 — USO DEL COEFICIENTE DE SOBRERRESISTENCIA Ωo — Cuando los requisitos para el material estructural y el grado de disipación de energía requieren que los elementos frágiles o las conexiones entre elementos se diseñen para fuerzas sísmicas,

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E, amplificadas por el coeficiente de sobrerresistencia, Ωo, éste debe emplearse de la siguiente manera para obtener las fuerzas de diseño que incluyen los efectos sísmicos:

$$E = \frac{\Omega o Fs}{R} \pm 0.5 As.Fa.D \qquad (A.3.3\text{-}2)$$

Donde Fs corresponde a las fuerzas sísmicas obtenidas del análisis, R es el coeficiente de capacidad de disipación de energía correspondiente al sistema estructural de resistencia sísmica R=Φa.Φp.Φr..Ro, y D corresponde a la carga muerta que actúa sobre el elemento tal como se define en el Título B del Reglamento y el signo de la parte derecha de la ecuación es el que conduce al mayor valor de E, dependiendo del signo de Fs.

DEFINICIÓN DE MATERIALES, ELEMENTOS Y CARGAS

La carga muerta a tener en cuenta será el peso propio del elemento tal como se especifica en el capítulo B, no se incluye viva ni viento, por ser elementos no estructurales, y la fuerza sísmica se determina de acuerdo al A.3.3.9.

Refuerzo:

El refuerzo para el diseño a momento flector como a cortante vertical debe tener un esfuerzo de fluencia igual:

Para barras >1/4” fy = 420 MPa = 4200 kgf/cm2 o fy = 60.000 psi

Mampostería No Estructural:

- Sistema: Mampostería reforzada con dovelas
- Unidad de mampostería Bloque concreto a la vista.
- Relación área neta / área bruta de las unidades de mampostería: 1,0
- Ancho equivalente 5,0 cm
- Altura de la unidad de mampostería 6.5 cm
- Resistencia unidad de mampostería f'cu : 160 Kg/cm²

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- Factor de corrección por absorción Kp : 0.8
- Mortero de pega Tipo M
- Resistencia mortero de pega f'cp : 180 Kg/cm²
- Rm [NSR-10 Ecuación D.3-1] 120.0 Kg/cm²
- Resistencia mortero de inyección f'cr : 210 Kg/cm²
- f 'm cuando hay celdas con mortero de inyección 100.0 Kgf/cm² = 10 MPa
- Modulo de elasticidad de la mampostería Em = 75000 Kgf/cm² = 7500 MPa
- Relación de Poisson υ = 0.25

La fuerza sísmica se ve afectada por los siguientes factores.

$$E = \frac{\Omega o Fs}{R} \pm 0.5 As.Fa.D \qquad (A.3.3\text{-}2)$$

De acuerdo al A.3.3.9, se debe usar un coeficiente de sobrerresistencia Ro, según la tabla A.3.1 Sistema estructural de muros de carga, para muros de mampostería confinada Ro =2.0 y Ωo=2.5, para muros de mampostería parcialmente reforzada de bloque de perforación vertical, Ro =2.0 y Ωo=2.5, para sistema combinado tabla A.3.2 Ro=5.0 y Ωo=2.0, para sistema pórtico resistente a momento tabla A.3.2 Ro=7.0 y Ωo=2.5 Para el cálculo del espectro afectado por el coeficiente de sobre resistencia, usado en el diseño de elementos no estructurales.

Para el diseño de los elementos no estructurales la carga por metro de un muro debe ser

Fhs = 0.23 x 20kN/m3 * 2.6m*1m*0.12m = 1.44kN/m
Vs = 1.44kN/m /2 = 0.7176 kN/m
Ms = 1.44kN/m * 2.6m / 4 = 0.936 kN-m /m

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D.5.6 — RESISTENCIA A FLEXIÓN SIN CARGA AXIAL

D.5.6.1 — GENERAL — Cuando la sección del muro esta sometida a momento flector sin la presencia de carga axial, se debe cumplir la siguiente condición:

$$\mathbf{M_u \le \phi M_n} \qquad \textbf{(D.5.6-1)}$$

D.5.6.2 — SECCIONES SOLO CON REFUERZO A TRACCIÓN — Cuando la sección del muro esta simplemente reforzada, y su cuantía es menor del 75% de la cuantía para condiciones balanceadas, la resistencia nominal a flexión $\mathbf{M_n}$, se puede obtener por medio de la ecuación (D.5.6-2).

$$\mathbf{M_n = A_s f_y \left(d - \frac{a}{2} \right)} \qquad \textbf{(D.5.6-2)}$$

y

$$\mathbf{a = \frac{A_s f_y}{0.80 f'_m b}} \qquad \textbf{(D.5.6-3)}$$

Se utilizará un muro parcialmente reforzado con dovelas #3 cada 0.80 metro.

$$\alpha = \frac{0.000071m2 * 420000KPa}{0.8 * 10000Kpa * 0.80m} = 0.00466m$$

$$\Phi Mn = 0.8 * 0.000071m2 * 420000kPa \left(0.06m - \frac{0.00466}{2}\right) = 1.37kN - m/m$$

0.936 kN-m /m < 1.37 kN-m/m: CUMPLE

D.5.7.4 — RESISTENCIA A CORTANTE EN LA DIRECCIÓN PERPENDICULAR AL PLANO DEL MURO — Se debe cumplir la siguiente condición con respecto a la fuerza cortante que actúa en la dirección perpendicular al plano del muro:

$$\mathbf{V_u \le \phi V_n} \qquad \textbf{(D.5.7-6)}$$

donde:

$$\mathbf{V_n = \frac{1}{6} A_{mv} \sqrt{f'_m}} \qquad \textbf{(D.5.7-7)}$$

donde $\mathbf{A_{mv}}$ está definido en D.5.4.5.1 y el valor del coeficiente de reducción de resistencia, ϕ, está dado en D.5.1.5.1.

$$\Phi Vn = 0.6 * \frac{1}{6} * 0.08m * \sqrt{10MPa} * \frac{1000kPa}{MPa} * 1m = 25.3\ Kn - m$$

0.7176 kN/m < 25.3kN-m: CUMPLE

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ANEXO:

UMBRAL DE DAÑO

PROYECTO:

ESTACIÓN DE BOMBEROS BOCAGRANDE

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UMBRAL DE DAÑO

Debido a que la edificación es perteneciente al grupo de uso III definido en A.2.5.1.1., se debe cumplir con unos requisitos adicionales, con el fin de garantizar que pueda operar durante y después de la ocurrencia de un sismo.

Por lo tanto, se determina el espectro sísmico para el umbral de daño, según las ecuaciones especificadas en la Figura A.12.3-1 de la NSR-10. El valor de $\bar{S}$ es igual a 1.25Fv y el valor de Ad, se determina de acuerdo a la tabla A.12.2-2 de la NSR-10, depende de la ubicación de la edificación, en este caso Ad tiene un valor de 0.03.

Espectro de aceleraciones horizontales elástico del umbral de daño.

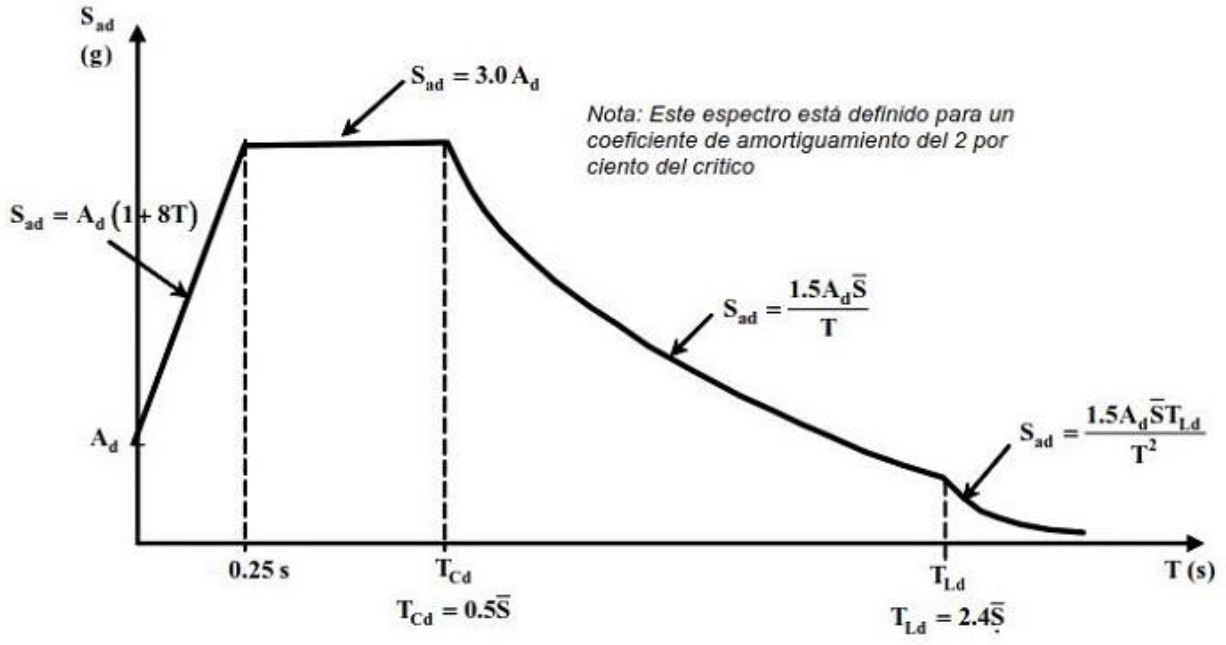


Figura A.12.3-1 — Espectro de aceleraciones horizontales elástico del umbral de daño

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CURVA – ESPECTRO DE UMBRAL DE DAÑO CARTAGENA

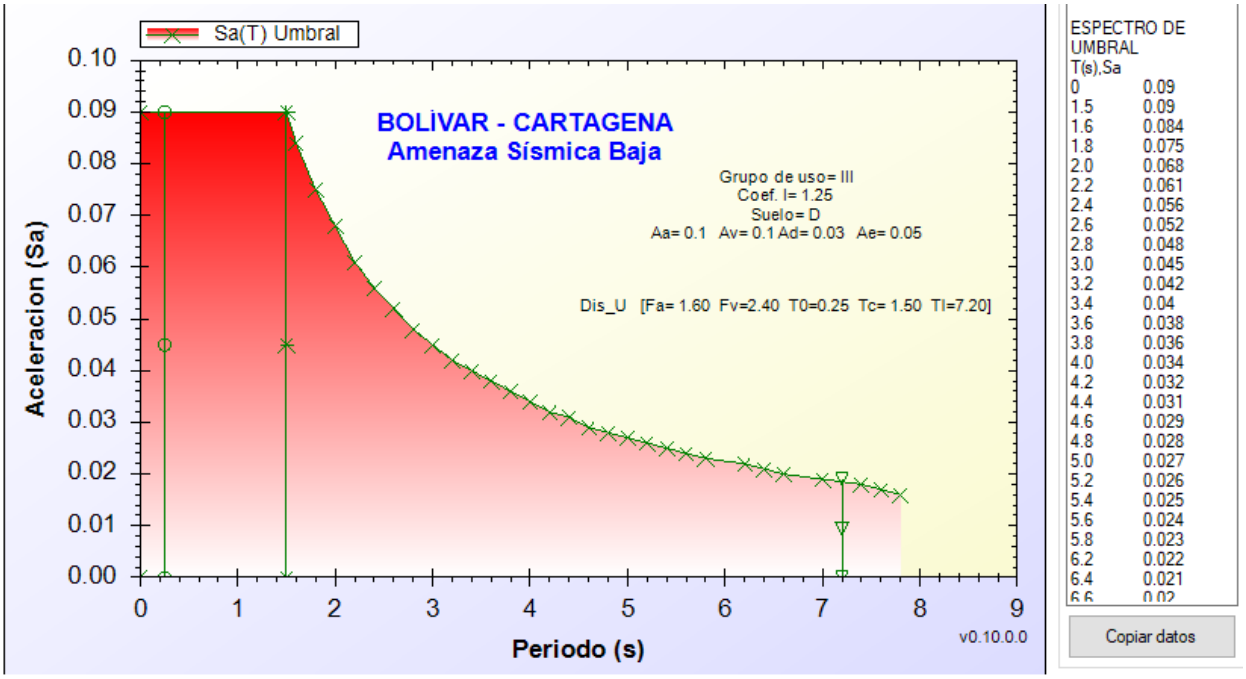


Tabla 1: DATOS DEL PROYECTO

EVALUACIÓN UMBRAL DE DAÑO

El análisis sísmico realizado con el espectro del umbral de daño, corresponde al método del Análisis Modal Espectral. Para aplicar correctamente este método se debe confirmar que en el análisis modal conforme a lo establecido en el literal A5.4-5 de la norma NSR-10, la estructura este excitando al menos el 90% de la masa total, y que la cortante en la base sea igual a Vsd= SadW.

Fuente de masa

Las fuerzas inerciales que se tuvieron en cuenta durante la elaboración del modelo son:

Carga permanente = Peso propio (PP) + Carga sobreimpuesta (SD) + 0% Carga viva

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Donde el porcentaje de carga viva se tomó de acuerdo a los requerimientos del Reglamento NSR-10, teniendo en cuenta la ocupación de la edificación y la probabilidad de permanencia de esta carga en un evento sísmico.

Método de la fuerza horizontal equivalente

- Periodo fundamental de la estructura: T = 0.926 s
- Coeficiente k, relacionado con el periodo fundamental:

(d) Para T menor o igual a 0.5 segundos, k = 1

(e) Para T entre 0.5 y 2.5 segundos, k = 0.75 + 0.5T

(f) Para T mayor que 2.5 segundos, k =2

En este caso k = 1.2

- Del espectro elástico de umbral de daño, se obtiene: Sad = 0.09

Cortante en la base

Cuando se utilice el método del análisis dinámico deben emplearse los requisitos del Capítulo A.5, se emplean los movimientos sísmicos correspondientes al umbral de daño en vez de los movimientos sísmicos de diseño. El ajuste de los resultados indicado en A.5.4.5 debe hacerse con respecto al valor de Vsd, obtenido por medio de la ecuación A.12.4-1, en vez de Vs.

Cortante en la base por FHE: Vsd

$$Vsd = (Sad)(g)(M) = (Sad)(W)$$

$$\text{Donde } W = 3017.50 \text{ Tn} \rightarrow Vsd = 271.57 \text{ Tn}$$

$$Vsd = Sad\ W = 271.57 \text{ Tn} \rightarrow 90\%Vsd = 244.41 \text{ Tn}$$

Se ajustaron las cortantes en la base generadas por el espectro elástico del umbral de daño que arroja en programa Midas Gen, debido a que eran menores al 90%Vsd.

D:\PAYE\23-PAYE-014 Estacion de Bomberos\23-PAYE-014 Estación de Bomberos Bocagrande\Memorial\23-PAYE-014 Estación de Bomberos Bocagrande - ANEXO UMBRAL DE DAÑO.docx

SUMMATION OF REACTION FORCES PRINTOUT							
	Load	FX (tonf)	FY (tonf)	FZ (tonf)			
	EXUdD(R	226.215157	26.184689	0.000000			
	EYUdD(R	26.184689	228.078585	0.000000			

Ajuste en la dirección X = 244.41/226.21 = 1.08

Ajuste en la dirección y = 244.41/228.07 = 1.07

Los factores de ajuste anteriores se usaron para corregir el factor de gravedad del espectro umbral en la respectiva dirección.

SUMMATION OF REACTION FORCES PRINTOUT							
	Load	FX (tonf)	FY (tonf)	FZ (tonf)			
	EXUdD(R	244.312369	28.279464	0.000000			
	EYUdD(R	28.017617	244.044086	0.000000			

Chequeo de Derivas – Espectro Umbral

En la tabla A.12.5-1 se establece el límite de derivas para estructuras en concreto reforzado de 0.4% para espectro umbral de daño.

Se calcularon los desplazamientos horizontales elásticos de la estructura por medio de un análisis modal espectral, con el espectro elastico de umbral de daño y se obtuvieron los desplazamientos horizontales se calcula los valores de deriva definidos como la diferencia entre los desplazamientos.

A continuación, se presentan los resultados de las derivas para el edificio, las cuales no superaron el maximo permitido del 0.4%, según tabla A.12.5-1.

NIVEL	Desplazamiento		Delta		deriva		CHEKEO	
SISMICOS	x (m)	y (m)	Δx	Δy	δx	δy	EN X	EN Y
5	0.02910	0.0244	0.0036	0.0032	0.0010	0.0009	ok	ok
4	0.02550	0.0212	0.0040	0.0042	0.0011	0.0012	ok	ok
3	0.02150	0.017	0.0074	0.0055	0.0021	0.0015	ok	ok
2	0.01410	0.0115	0.0087	0.0065	0.0024	0.0018	ok	ok
1	0.00540	0.005	0.0054	0.005	0.0015	0.0014	ok	ok

D:\PAYE\I23-PAYE-014 Estacion de Bomberos\I23-PAYE-014 Estación de Bomberos Bocagrande\Memoria\I23-PAYE-014 Estación de Bomberos Bocagrande - ANEXO CIMENTACION.docx

ANEXO:

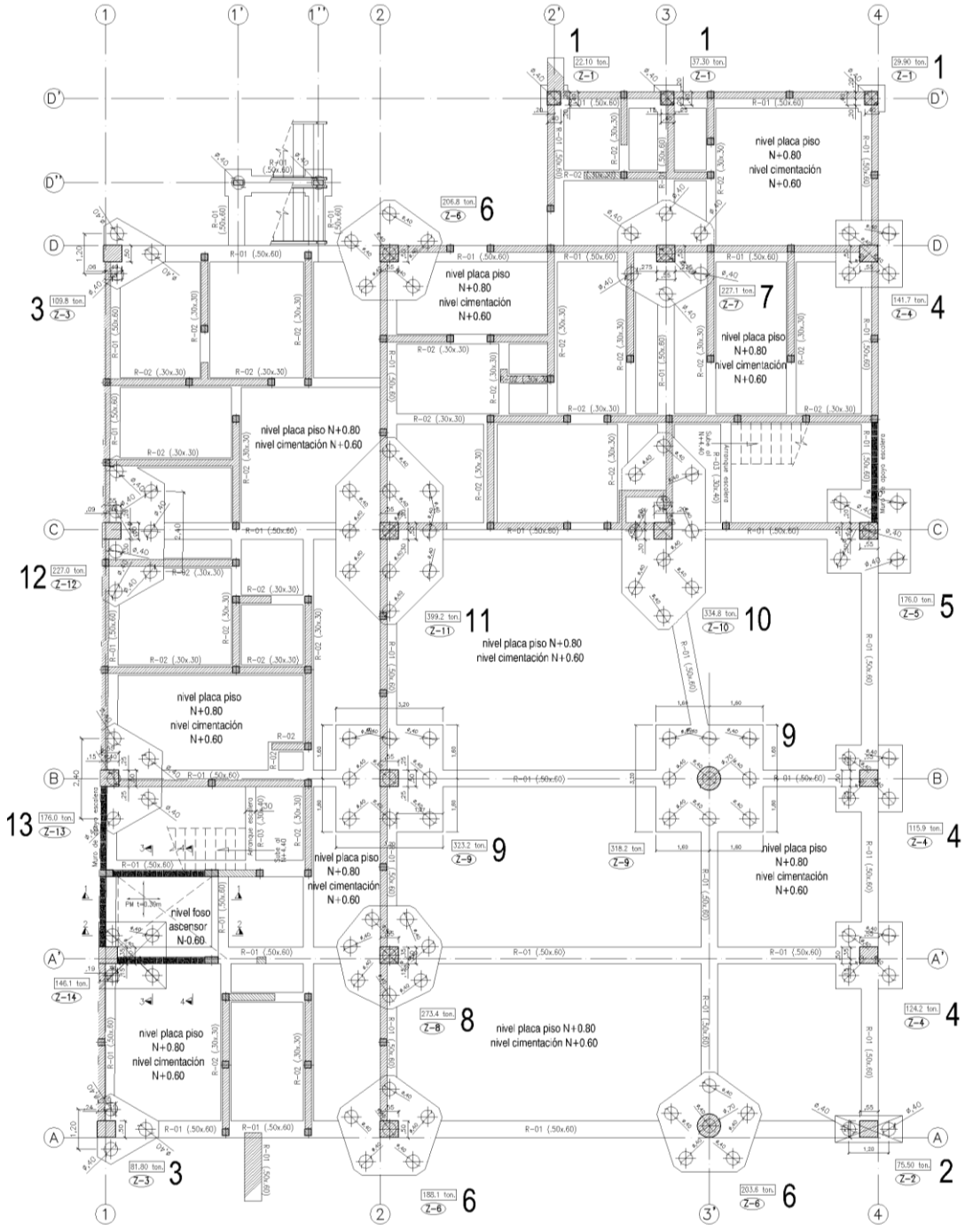
CIMENTACION

PROYECTO:

ESTACIÓN DE BOMBEROS BOCAGRANDE

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PLANTA DE CIMENTACION



PLANTA DE CIMENTACIÓN NIVEL N+0.60

ESCALA–1:75

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O9.

CARGAS DE CIMENTACION

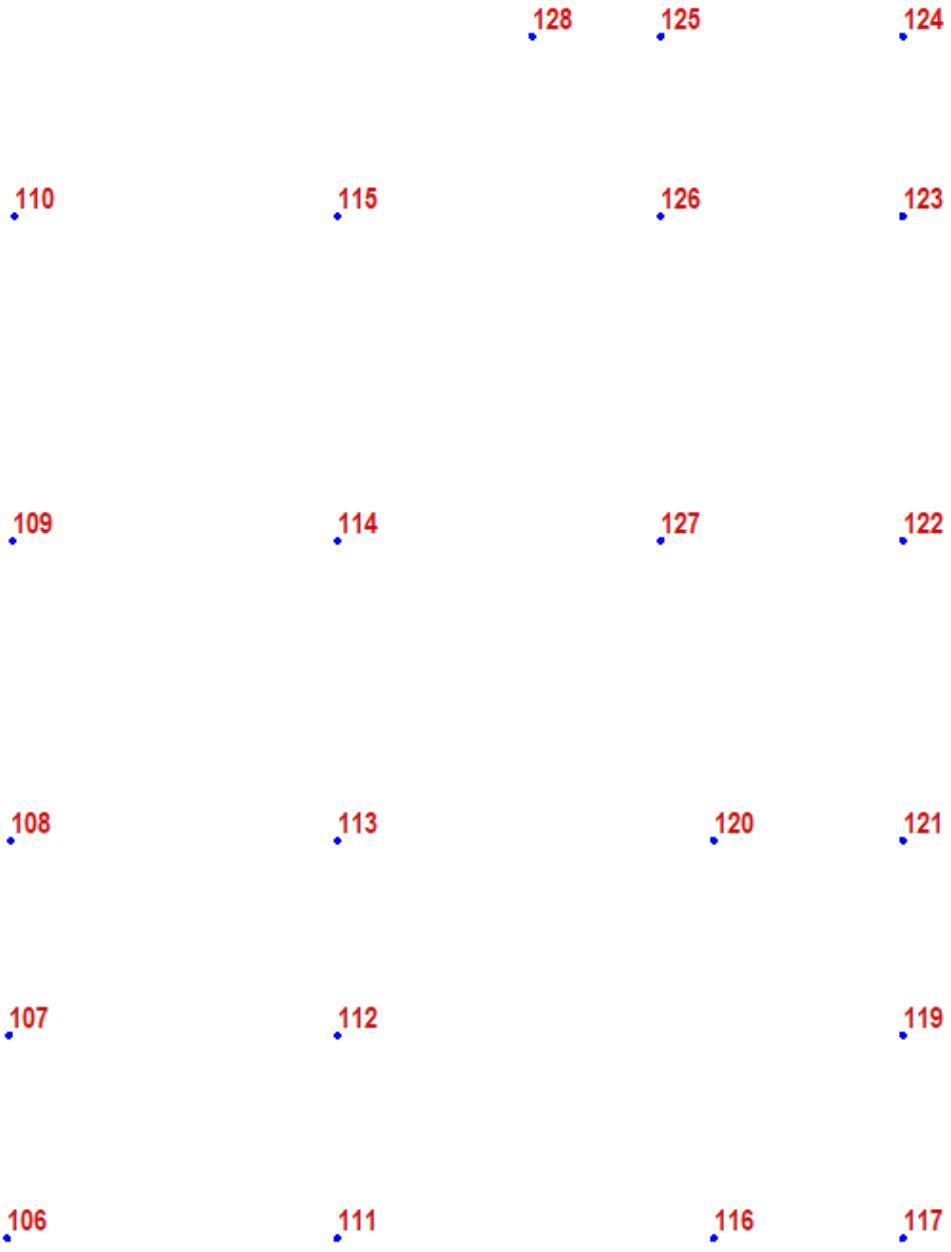


Ilustración 1: Nodos cimentación

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Tabla 1: Cargas de Cimentacion

MIDAS/Gen | Result-[Reaction]

Node	Load	FX (tonf)	FY (tonf)	FZ (tonf)	MX (tonf*m)	MY (tonf*m)	MZ (tonf*m)
106	CIM	5.855134	0.769202	81.832965	2.538641	-1.544896	0.007421
107	CIM	8.040855	-0.360169	146.122007	0.279298	0.975502	0.007421
108	CIM	9.156742	0.977870	176.028929	3.152147	2.235965	0.007422
109	CIM	11.816976	0.000034	227.015750	1.334546	5.302880	0.007421
110	CIM	5.365854	-3.638329	109.766792	-3.996485	-1.821344	0.007420
111	CIM	-5.993404	0.352242	188.137375	2.963351	-8.862907	0.007420
112	CIM	-8.398152	-0.174261	273.439361	0.022999	-0.577855	0.007420
113	CIM	-10.037081	0.544533	323.247375	3.595713	-13.619404	0.007418
114	CIM	-5.994664	4.336854	399.205711	-3.612168	-6.351140	0.007420
115	CIM	1.028182	-7.025685	206.757757	-0.525500	0.241783	0.007419
116	CIM	-2.992500	4.002580	203.615203	2.949458	1.181811	-0.002385
117	CIM	0.831294	-0.072941	75.517281	3.364349	4.190547	0.007420
119	CIM	2.053347	0.078119	124.181077	-0.341702	2.772135	0.007420
120	CIM	-4.115081	-2.285197	318.223238	0.055186	-0.199297	-0.002387
121	CIM	0.746105	-0.244274	115.913442	4.407670	4.025243	0.007420
122	CIM	-1.531400	3.382813	176.018859	-2.613512	3.169026	0.007421
123	CIM	-4.135550	-2.286219	141.692583	-3.099148	0.186895	0.007420
124	CIM	-1.037133	-0.475358	29.874040	-1.997654	3.463197	0.002535
125	CIM	0.783982	-0.725145	37.316383	-1.700091	-2.313127	0.002535
126	CIM	-0.975977	-5.121917	227.140906	-0.333017	4.759651	0.007420
127	CIM	-0.705110	9.370733	334.750188	-9.453833	1.901719	0.007421
128	CIM	0.237583	-1.405486	22.055656	-5.483118	-0.515319	0.002535

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Z-1

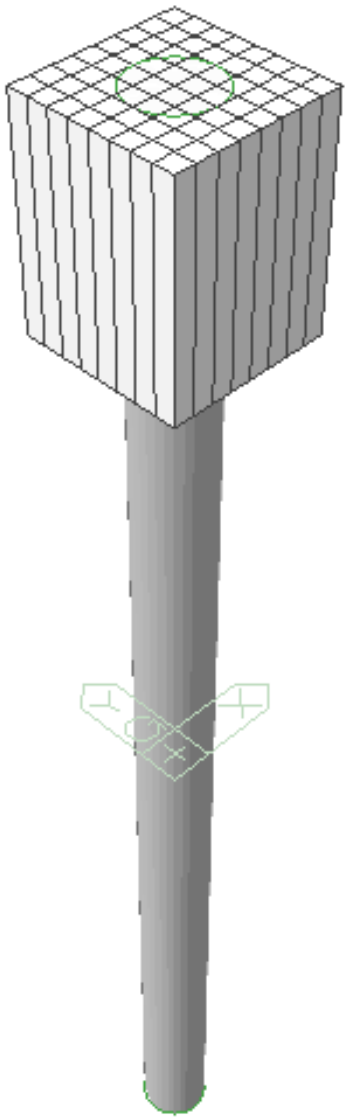


Ilustración 2: Modelo Matematico Z-1

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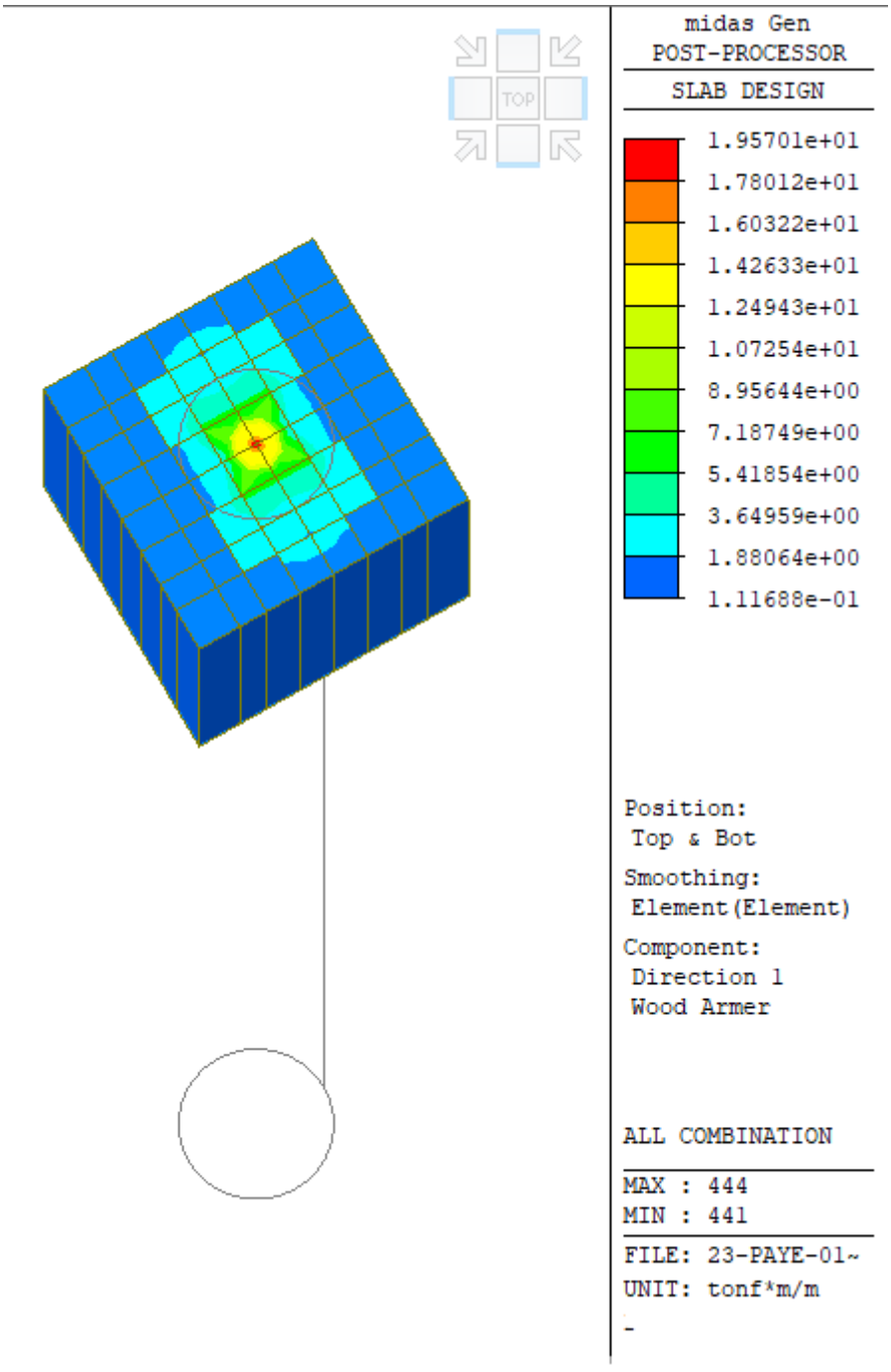


Ilustración 3: Solicitaciones de diseño

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```
--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
============================================================================================

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-[1], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ------------------------------------------------------------------
  1.0000    421 BOT 0.0016 0.0019 | 3.41441(   1) 56.2795 0.061  OK
            421 TOP 0.0018 0.0019 | 19.5701(   1) 63.4644 0.308  OK
 ------------------------------------------------------------------

 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 421
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       3.4144  tonf-m./m.
    RatM   = Mu / phiMn =   0.061  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 421
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      19.5701  tonf-m./m.
    RatM   = Mu / phiMn =   0.308  <  1.0  --->  O.K !
```

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```
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-[2], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000    444 BOT 0.0016 0.0019 | 3.41441(   1) 56.2795 0.061  OK
            444 TOP 0.0018 0.0019 | 19.5701(   1) 63.4644 0.308  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 444
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       3.4144  tonf-m./m.
    RatM   = Mu / phiMn =   0.061  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 444
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      19.5701  tonf-m./m.
    RatM   = Mu / phiMn =   0.308  <  1.0  --->  O.K !
```

```
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-[3], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ------------------------------------------------------------------
  1.0000    481 BOT 0.0016 0.0019 | 3.41441(   1) 56.2795 0.061  OK
            481 TOP 0.0018 0.0019 | 19.5701(   1) 63.4644 0.308  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 481
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       3.4144  tonf-m./m.
    RatM   = Mu / phiMn =   0.061  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 481
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      19.5701  tonf-m./m.
    RatM   = Mu / phiMn =   0.308  <  1.0  --->  O.K !
```

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```
---------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
=============================================================================================
=========================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-[1], Dir 2.
=========================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ---------------------------------------------------------------------
  1.0000    421 BOT 0.0016 0.0019 | 3.41441(   1) 56.2795 0.061  OK
            421 TOP 0.0018 0.0019 | 19.5701(   1) 63.4644 0.308  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 421
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       3.4144  tonf-m./m.
    RatM   = Mu / phiMn =   0.061  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 421
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      19.5701  tonf-m./m.
    RatM   = Mu / phiMn =   0.308  <  1.0  --->  O.K !
```

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```
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-[2], Dir 2.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000    444 BOT 0.0016 0.0019 | 3.41441(   1) 56.2795 0.061  OK
            444 TOP 0.0018 0.0019 | 19.5701(   1) 63.4644 0.308  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 444
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       3.4144  tonf-m./m.
    RatM   = Mu / phiMn =   0.061  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 444
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      19.5701  tonf-m./m.
    RatM   = Mu / phiMn =   0.308  <  1.0  --->  O.K !
```

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```
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 1-[3], Dir 2.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000    481 BOT 0.0016 0.0019 | 3.41441(   1) 56.2795 0.061  OK
            481 TOP 0.0018 0.0019 | 19.5701(   1) 63.4644 0.308  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 481
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       3.4144  tonf-m./m.
    RatM   = Mu / phiMn =   0.061  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 481
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      19.5701  tonf-m./m.
    RatM   = Mu / phiMn =   0.308  <  1.0  --->  O.K !
```

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Z-2

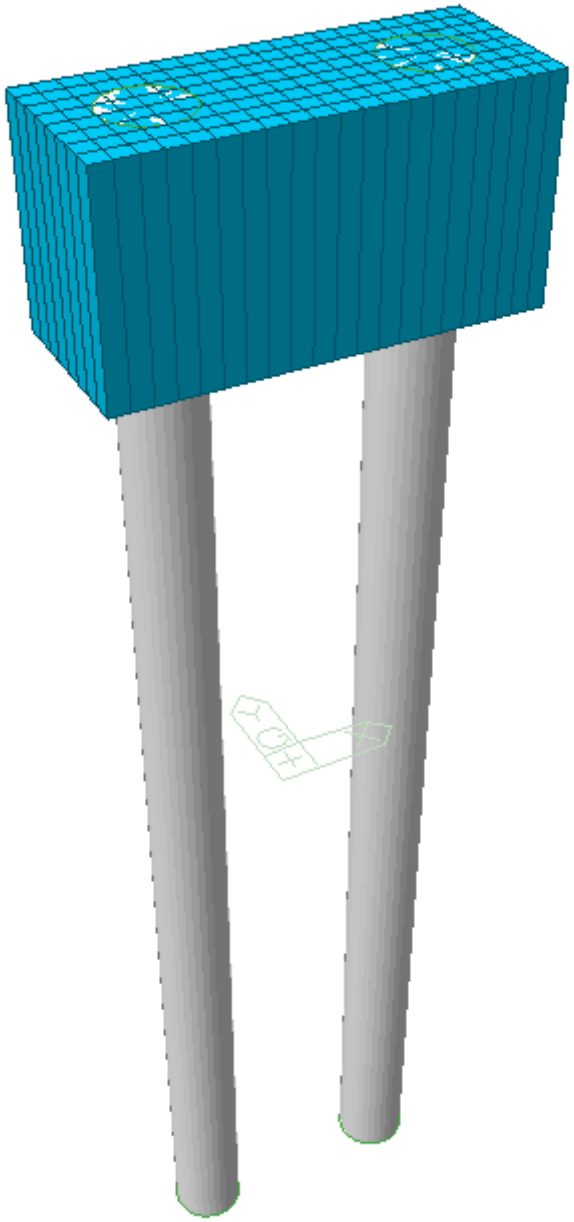


Ilustración 4: Modelo Matematico Z-2

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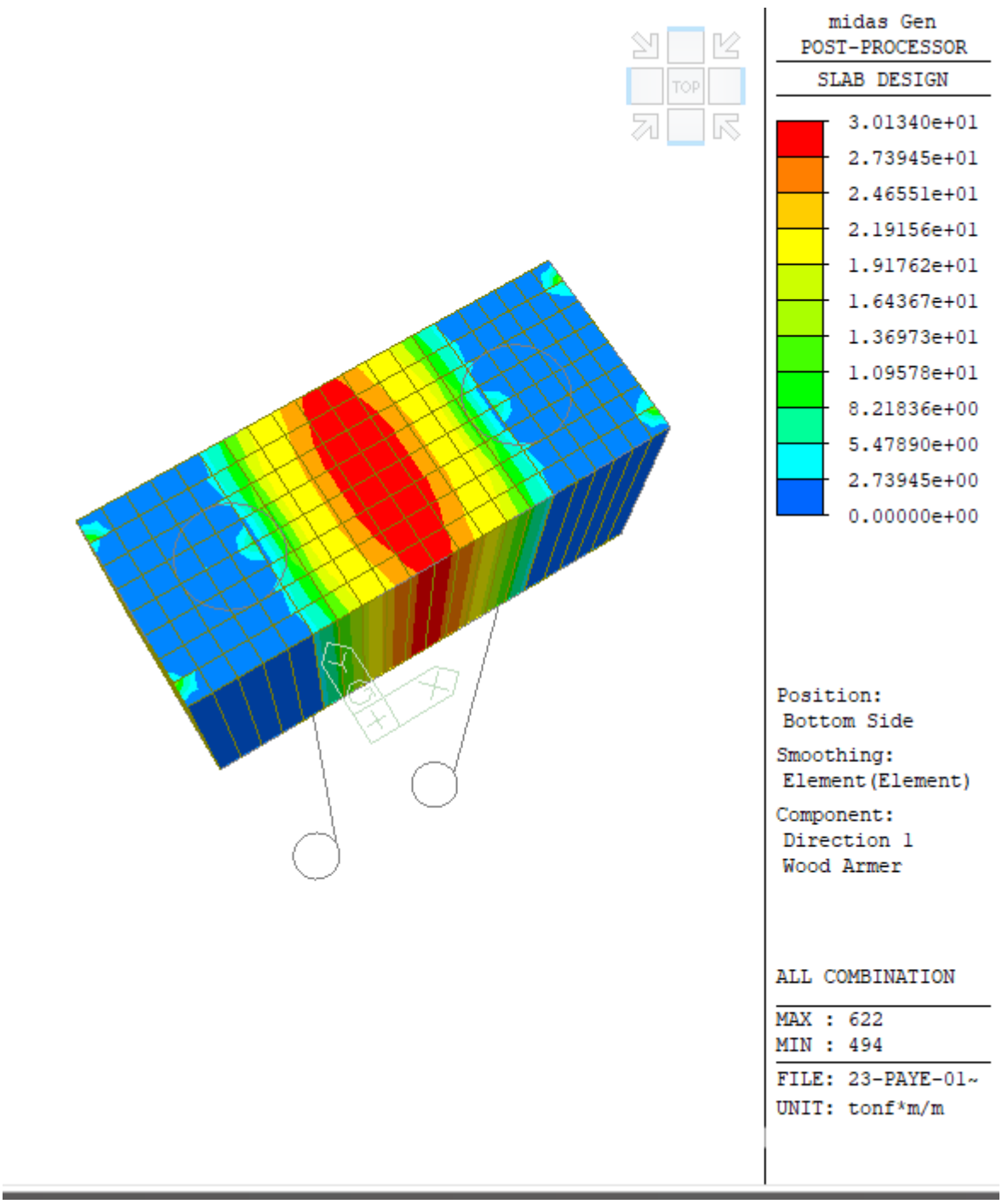


Ilustración 5: Solicitaciones de diseño

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```
------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
==========================================================================================
==========================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 2-[1], Dir 1.
==========================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ---------------------------------------------------------------------
  1.0000    508 BOT 0.0016 0.0019 | 3.93385(   1) 56.2795 0.070  OK
            509 TOP 0.0018 0.0019 | 43.9367(   1) 63.4644 0.692  OK
 ---------------------------------------------------------------------

 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 508
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       3.9339  tonf-m./m.
    RatM   = Mu / phiMn =   0.070  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 509
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      43.9367  tonf-m./m.
    RatM   = Mu / phiMn =   0.692  <  1.0  --->  O.K !
```

```
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 2-[2], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ------------------------------------------------------------------
  1.0000    530 BOT 0.0016 0.0019 | 30.1340(   1) 56.2795 0.535  OK
            510 TOP 0.0018 0.0019 | 23.8765(   1) 63.4644 0.376  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 530
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =      30.1340  tonf-m./m.
    RatM   = Mu / phiMn =   0.535  <  1.0  --->  O.K !
 << TOP >>

 -. Information of Parameters.
    Elem No.  : 510
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      23.8765  tonf-m./m.
    RatM   = Mu / phiMn =   0.376  <  1.0  --->  O.K !
```

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```
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 2-[5], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000    622 BOT 0.0016 0.0019 | 30.1340(   1) 56.2795 0.535  OK
            642 TOP 0.0018 0.0019 | 23.8765(   1) 63.4644 0.376  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 622
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =      30.1340  tonf-m./m.
    RatM   = Mu / phiMn =   0.535  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 642
    Thickness :    1.0000 m.

    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      23.8765  tonf-m./m.
    RatM   = Mu / phiMn =   0.376  <  1.0  --->  O.K !
```

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```
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 2-[6], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ------------------------------------------------------------------
  1.0000    648 BOT 0.0016 0.0019 | 3.93385(   1) 56.2795 0.070  OK
            649 TOP 0.0018 0.0019 | 43.9367(   1) 63.4644 0.692  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 648
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       3.9339  tonf-m./m.
    RatM   = Mu / phiMn =   0.070  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 649
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      43.9367  tonf-m./m.
    RatM   = Mu / phiMn =   0.692  <  1.0  --->  O.K !
```

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```
---------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
=============================================================================================
=============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 2-[1], Dir 2.
=============================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ---------------------------------------------------------------------
  1.0000    508 BOT 0.0016 0.0019 | 5.78623(   1) 56.2795 0.103  OK
            494 TOP 0.0018 0.0019 | 27.6690(   1) 63.4644 0.436  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 508
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       5.7862  tonf-m./m.
    RatM   = Mu / phiMn =   0.103  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 494
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
```

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```
    Mu                  =      27.6690  tonf-m./m.
    RatM   = Mu / phiMn =   0.436  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 2-[2], Dir 2.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ------------------------------------------------------------------
  1.0000    527 BOT 0.0016 0.0019 | 3.50109(   1) 56.2795 0.062  OK
            510 TOP 0.0018 0.0019 | 28.4079(   1) 63.4644 0.448  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 527
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       3.5011  tonf-m./m.
    RatM   = Mu / phiMn =   0.062  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 510
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      28.4079  tonf-m./m.
    RatM   = Mu / phiMn =   0.448  <  1.0  --->  O.K !
```

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```
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 2-[3], Dir 2.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000    560 BOT 0.0016 0.0019 | 7.71634(   1) 56.2795 0.137  OK
            574 TOP 0.0018 0.0019 | 28.0227(   1) 63.4644 0.442  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 560
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       7.7163  tonf-m./m.
    RatM   = Mu / phiMn =   0.137  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 574
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      28.0227  tonf-m./m.
    RatM   = Mu / phiMn =   0.442  <  1.0  --->  O.K !
```

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Z-3

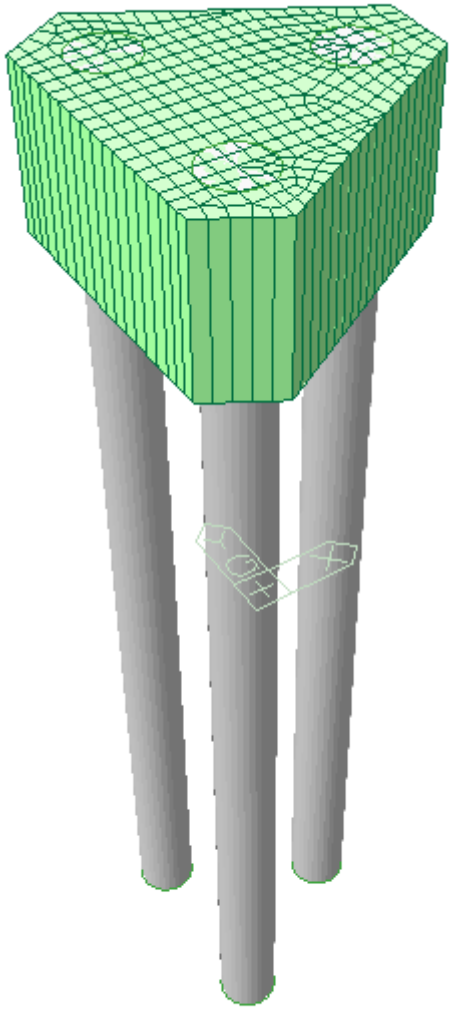


Ilustración 6: Modelo Matematico Z-3

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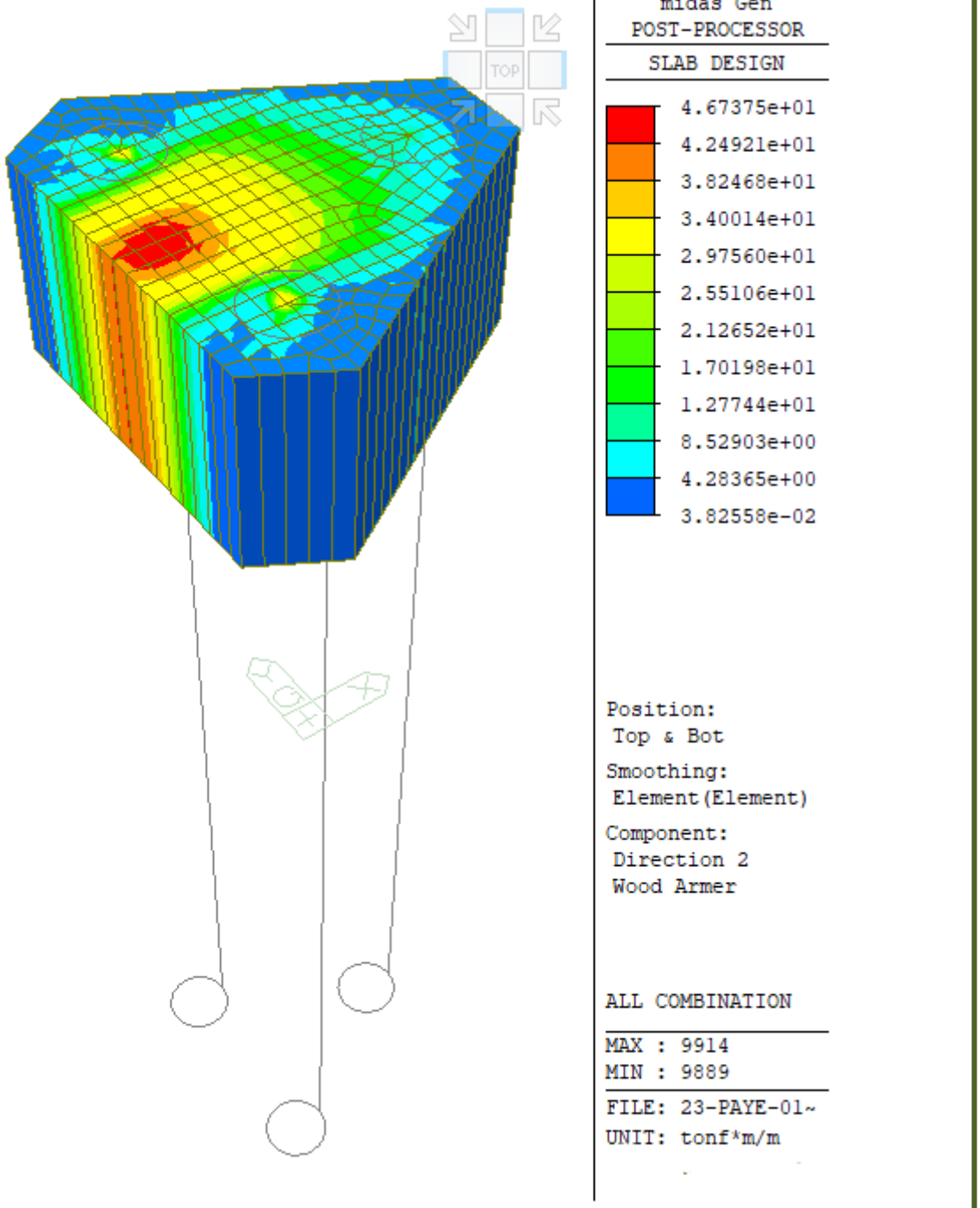


Ilustración 7: Solicitaciones de diseño

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```
--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
============================================================================================
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 11-z3, Dir 1.
================================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ---------------------------------------------------------------------
  1.0000   9793 BOT 0.0016 0.0019 | 11.5859(   1) 56.2795 0.206  OK
          10033 TOP 0.0018 0.0019 | 52.3270(   1) 63.4644 0.825  OK
 ---------------------------------------------------------------------

 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 9793
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =      11.5859  tonf-m./m.
    RatM   = Mu / phiMn =   0.206  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 10033
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      52.3270  tonf-m./m.
    RatM   = Mu / phiMn =   0.825  <  1.0  --->  O.K !
```

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```
--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
============================================================================================
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 11-z3, Dir 2.
================================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ---------------------------------------------------------------------
  1.0000   9914 BOT 0.0016 0.0019 | 46.7375(   1) 56.2795 0.830  OK
           9650 TOP 0.0018 0.0019 | 36.1455(   1) 63.4644 0.570  OK
 ---------------------------------------------------------------------

 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 9914
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =      46.7375  tonf-m./m.
    RatM   = Mu / phiMn =   0.830  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 9650
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      36.1455  tonf-m./m.
    RatM   = Mu / phiMn =   0.570  <  1.0  --->  O.K !
```

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```
--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
============================================================================================
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 11-z3, Dir 1.
================================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ---------------------------------------------------------------------
  1.0000   9819 BOT 0.0000 0.0019 | 0.00000(   1) 56.2795 0.000  OK
           9819 TOP 0.0018 0.0019 | 10.9862(   1) 63.4644 0.173  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 9819
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0000 m^2/m.  (       0.0000 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       0.0000  tonf-m./m.
    RatM   = Mu / phiMn =   0.000  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 9819
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      10.9862  tonf-m./m.
    RatM   = Mu / phiMn =   0.173  <  1.0  --->  O.K !
```

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```
--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
============================================================================================
============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 11-z3, Dir 2.
============================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ---------------------------------------------------------------------
  1.0000   9819 BOT 0.0016 0.0019 | 18.3781(   1) 56.2795 0.327  OK
           9819 TOP 0.0000 0.0019 | 0.00000(   1) 63.4644 0.000  OK
 ---------------------------------------------------------------------

 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 9819
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =      18.3781  tonf-m./m.
    RatM   = Mu / phiMn =   0.327  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 9819
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0000 m^2/m.  (       0.0000 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =       0.0000  tonf-m./m.
    RatM   = Mu / phiMn =   0.000  <  1.0  --->  O.K !
```

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```
--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
============================================================================================
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 11-z3, Dir 1.
================================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ---------------------------------------------------------------------
  1.0000   9793 BOT 0.0016 0.0019 | 11.5859(   1) 56.2795 0.206  OK
          10033 TOP 0.0018 0.0019 | 52.3270(   1) 63.4644 0.825  OK
 ---------------------------------------------------------------------

 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 9793
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =      11.5859  tonf-m./m.
    RatM   = Mu / phiMn =   0.206  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 10033
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      52.3270  tonf-m./m.
    RatM   = Mu / phiMn =   0.825  <  1.0  --->  O.K !
```

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```
--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
============================================================================================
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 11-z3, Dir 2.
================================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ---------------------------------------------------------------------
  1.0000   9914 BOT 0.0016 0.0019 | 46.7375(   1) 56.2795 0.830  OK
           9650 TOP 0.0018 0.0019 | 36.1455(   1) 63.4644 0.570  OK
 ---------------------------------------------------------------------

 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 9914
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =      46.7375  tonf-m./m.
    RatM   = Mu / phiMn =   0.830  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 9650
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      36.1455  tonf-m./m.
    RatM   = Mu / phiMn =   0.570  <  1.0  --->  O.K !
```

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Z-4

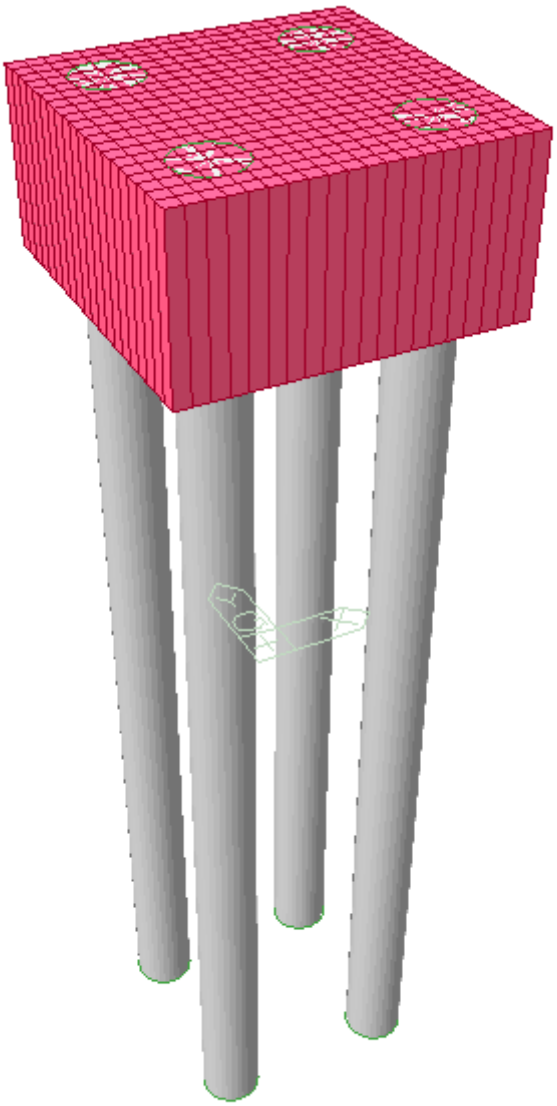


Ilustración 8: Modelo Matematico Z-4

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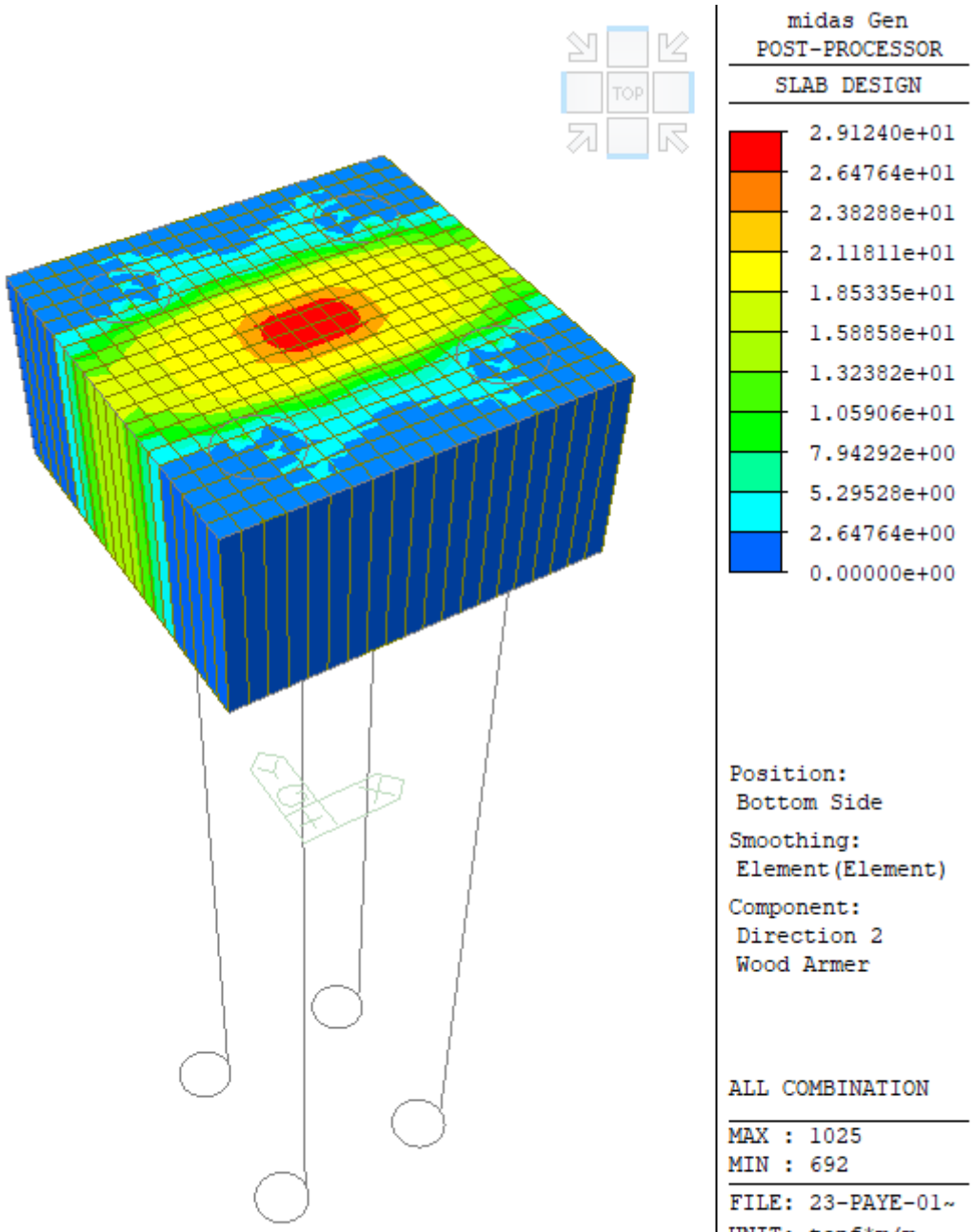


Ilustración 9: Solicitaciones de diseño

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```
--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
============================================================================================
============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 3-[1], Dir 1.
============================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000    707 BOT 0.0016 0.0019 | 1.51771(   1) 56.2795 0.027  OK
            707 TOP 0.0018 0.0019 | 36.9032(   1) 63.4644 0.581  OK
 ------------------------------------------------------------------

 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 707
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       1.5177  tonf-m./m.
    RatM   = Mu / phiMn =   0.027  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 707
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      36.9032  tonf-m./m.
    RatM   = Mu / phiMn =   0.581  <  1.0  --->  O.K !
```

```
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 3-[2], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000    736 BOT 0.0016 0.0019 | 18.0125(   1) 56.2795 0.320  OK
            752 TOP 0.0018 0.0019 | 24.3997(   1) 63.4644 0.384  OK
 ------------------------------------------------------------------

 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 736
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =      18.0125  tonf-m./m.
    RatM   = Mu / phiMn =   0.320  <  1.0  --->  O.K !
 << TOP >>

 -. Information of Parameters.
    Elem No.  : 752
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      24.3997  tonf-m./m.
    RatM   = Mu / phiMn =   0.384  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 3-[3], Dir 1.
================================================================================
 ------------------------------------------------------------------
```

```
    Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
-------------------------------------------------------------------
 1.0000    759 BOT 0.0016 0.0019 | 1.51771(   1) 56.2795 0.027  OK
           759 TOP 0.0018 0.0019 | 36.9032(   1) 63.4644 0.581  OK
-------------------------------------------------------------------


<< BOTTOM >>

-. Information of Parameters.
   Elem No.  : 759
   Thickness :    1.0000 m.
   Materials :  fc  =   2812.2792 tonf/m^2.
                Fy  =  42184.1879 tonf/m^2.
   Covering  :  dB  =   0.2000 m.
                dT  =   0.1000 m.
   LCB No.   :    1

-. Information of Design.
   phi    =   0.900
   b      =   0.0010 m.  (by Code Unit Length).
   d      =   0.8000 m.

-. Information of Moments and Result.
   Rein. Bar :  #6 @150
   As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
   As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
   Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
   phiMn  = phi * Mn   =      56.2795  tonf-m./m.
   Mu                  =       1.5177  tonf-m./m.
   RatM   = Mu / phiMn =   0.027  <  1.0  --->  O.K !

<< TOP >>

-. Information of Parameters.
   Elem No.  : 759
   Thickness :    1.0000 m.
   Materials :  fc  =   2812.2792 tonf/m^2.
                Fy  =  42184.1879 tonf/m^2.
   Covering  :  dB  =   0.2000 m.
                dT  =   0.1000 m.
   LCB No.   :    1

-. Information of Design.
   phi    =   0.900
   b      =   0.0010 m.  (by Code Unit Length).
   d      =   0.9000 m.

-. Information of Moments and Result.
   Rein. Bar :  #6 @150
   As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
   As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
   Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
   phiMn  = phi * Mn   =      63.4644  tonf-m./m.
   Mu                  =      36.9032  tonf-m./m.
   RatM   = Mu / phiMn =   0.581  <  1.0  --->  O.K !
```

```
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 3-[4], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000    804 BOT 0.0016 0.0019 | 5.78662(   1) 56.2795 0.103  OK
            816 TOP 0.0018 0.0019 | 24.0306(   1) 63.4644 0.379  OK
 ------------------------------------------------------------------

 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 804
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       5.7866  tonf-m./m.
    RatM   = Mu / phiMn =   0.103  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 816
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      24.0306  tonf-m./m.
    RatM   = Mu / phiMn =   0.379  <  1.0  --->  O.K !
```

```
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 3-[5], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000    823 BOT 0.0016 0.0019 | 1.51771(   1) 56.2795 0.027  OK
            823 TOP 0.0018 0.0019 | 36.9032(   1) 63.4644 0.581  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 823
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =       1.5177  tonf-m./m.
    RatM   = Mu / phiMn =   0.027  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 823
    Thickness :    1.0000 m.

    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      36.9032  tonf-m./m.
    RatM   = Mu / phiMn =   0.581  <  1.0  --->  O.K !
```

```
================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 3-[6], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000    864 BOT 0.0016 0.0019 | 18.0125(   1) 56.2795 0.320  OK
            880 TOP 0.0018 0.0019 | 24.3997(   1) 63.4644 0.384  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 864
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      62.5328  tonf-m./m.
    phiMn  = phi * Mn   =      56.2795  tonf-m./m.
    Mu                  =      18.0125  tonf-m./m.
    RatM   = Mu / phiMn =   0.320  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 880
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #6 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0019 m^2/m.  (       0.0019 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      70.5160  tonf-m./m.
    phiMn  = phi * Mn   =      63.4644  tonf-m./m.
    Mu                  =      24.3997  tonf-m./m.
    RatM   = Mu / phiMn =   0.384  <  1.0  --->  O.K !

    RatM   = Mu / phiMn =   0.353  <  1.0  --->  O.K !
```

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Z-5

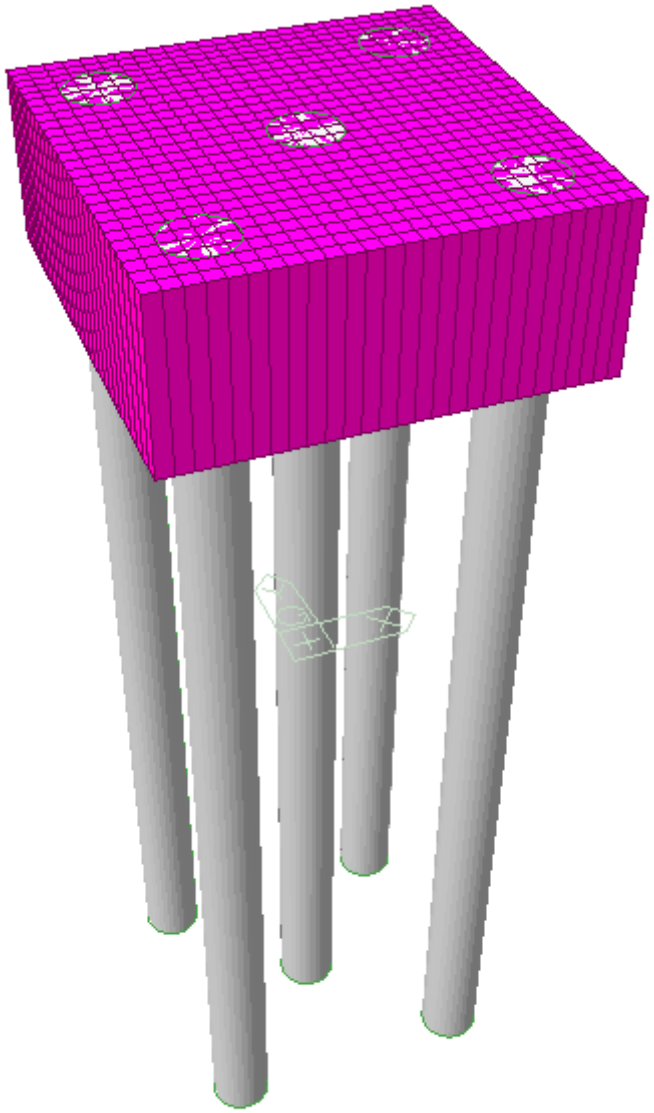


Ilustración 10: Modelo Matematico Z-5

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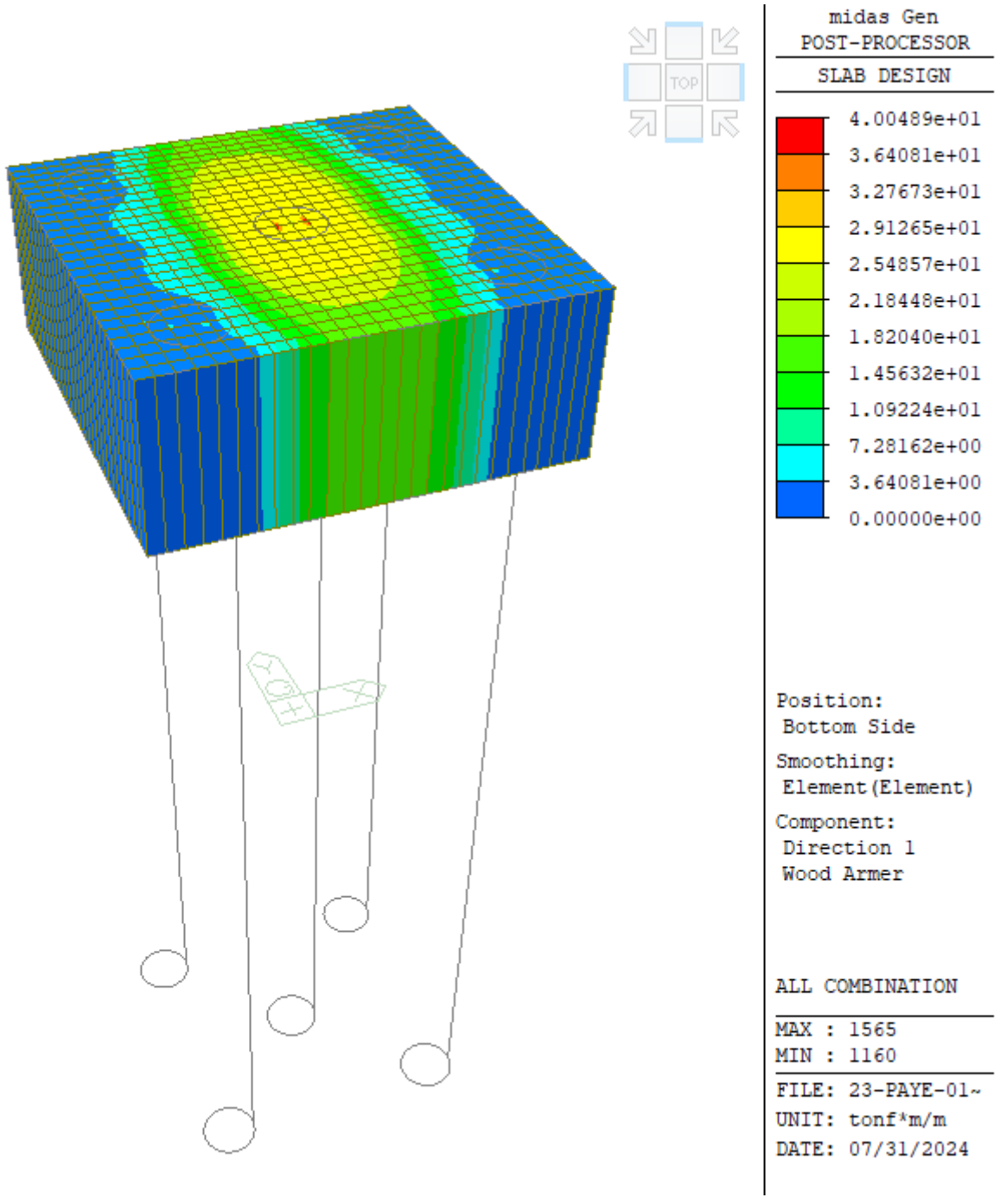


Ilustración 11: Solicitaciones de diseño

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```
------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
==========================================================================================


================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 4-[1], Dir 1.
================================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ---------------------------------------------------------------------
  1.0000   1175 BOT 0.0016 0.0026 | 2.42848(   1) 76.1498 0.032  OK
           1175 TOP 0.0018 0.0026 | 59.7348(   1) 85.9474 0.695  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 1175
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       2.4285  tonf-m./m.
    RatM   = Mu / phiMn =   0.032  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 1175
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
```

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```
    Mu                  =      59.7348  tonf-m./m.
    RatM   = Mu / phiMn =   0.695  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 4-[2], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   1180 BOT 0.0016 0.0026 | 19.3097(   1) 76.1498 0.254  OK
           1208 TOP 0.0018 0.0026 | 27.4118(   1) 85.9474 0.319  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 1180
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      19.3097  tonf-m./m.
    RatM   = Mu / phiMn =   0.254  <  1.0  --->  O.K !

--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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 << TOP >>

 -. Information of Parameters.
    Elem No.  : 1208
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
```

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```
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      27.4118  tonf-m./m.
    RatM   = Mu / phiMn =   0.319  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 4-[3], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   1240 BOT 0.0016 0.0026 | 19.3071(   1) 76.1498 0.254  OK
           1212 TOP 0.0018 0.0026 | 27.8054(   1) 85.9474 0.324  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 1240
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      19.3071  tonf-m./m.
    RatM   = Mu / phiMn =   0.254  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 1212
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
```

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```
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      27.8054  tonf-m./m.
    RatM   = Mu / phiMn =   0.324  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 4-[4], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   1251 BOT 0.0016 0.0026 | 4.44327(   1) 76.1498 0.058  OK
           1251 TOP 0.0020 0.0026 | 65.6218(   1) 85.9474 0.764  OK
 ------------------------------------------------------------------


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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
=================================================================================================


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 1251
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       4.4433  tonf-m./m.
    RatM   = Mu / phiMn =   0.058  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 1251
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
```

```
    As_req =       0.0020 m^2/m.  (       0.0020 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      65.6218  tonf-m./m.
    RatM   = Mu / phiMn =   0.764  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 4-[5], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   1283 BOT 0.0016 0.0026 | 4.61221(   1) 76.1498 0.061  OK
           1308 TOP 0.0018 0.0026 | 26.6542(   1) 85.9474 0.310  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 1283
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       4.6122  tonf-m./m.
    RatM   = Mu / phiMn =   0.061  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 1308
    Thickness :    1.0000 m.
```

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```
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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      26.6542  tonf-m./m.
    RatM   = Mu / phiMn =   0.310  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 4-[6], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   1338 BOT 0.0016 0.0026 | 4.60365(   1) 76.1498 0.060  OK
           1313 TOP 0.0018 0.0026 | 26.9234(   1) 85.9474 0.313  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 1338
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       4.6036  tonf-m./m.
    RatM   = Mu / phiMn =   0.060  <  1.0  --->  O.K !

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```

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```
 -. Information of Parameters.
    Elem No.  : 1313
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      26.9234  tonf-m./m.
    RatM   = Mu / phiMn =   0.313  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 4-[7], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   1362 BOT 0.0016 0.0026 | 3.23233(   1) 76.1498 0.042  OK
           1362 TOP 0.0022 0.0026 | 72.2878(   1) 85.9474 0.841  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 1362
    Thickness :    1.0000 m.

--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
============================================================================================

    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       3.2323  tonf-m./m.
    RatM   = Mu / phiMn =   0.042  <  1.0  --->  O.K !
```

```
<< TOP >>

-. Information of Parameters.
   Elem No.  : 1362
   Thickness :    1.0000 m.
   Materials :  fc  =   2812.2792 tonf/m^2.
                Fy  =  42184.1879 tonf/m^2.
   Covering  :  dB  =   0.2000 m.
                dT  =   0.1000 m.
   LCB No.   :    1

-. Information of Design.
   phi    =   0.900
   b      =   0.0010 m.  (by Code Unit Length).
   d      =   0.9000 m.

-. Information of Moments and Result.
   Rein. Bar :  #7 @150
   As_req =       0.0022 m^2/m.  (       0.0022 m^2/m.)
   As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
   Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
   phiMn  = phi * Mn   =      85.9474  tonf-m./m.
   Mu                  =      72.2878  tonf-m./m.
   RatM   = Mu / phiMn =   0.841  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 4-[8], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   1388 BOT 0.0016 0.0026 | 19.3226(   1) 76.1498 0.254  OK
           1423 TOP 0.0018 0.0026 | 28.1685(   1) 85.9474 0.328  OK
 ------------------------------------------------------------------


<< BOTTOM >>

-. Information of Parameters.
   Elem No.  : 1388
   Thickness :    1.0000 m.
   Materials :  fc  =   2812.2792 tonf/m^2.
                Fy  =  42184.1879 tonf/m^2.
   Covering  :  dB  =   0.2000 m.
                dT  =   0.1000 m.
   LCB No.   :    1

-. Information of Design.
   phi    =   0.900
   b      =   0.0010 m.  (by Code Unit Length).
   d      =   0.8000 m.

-. Information of Moments and Result.
   Rein. Bar :  #7 @150
   As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
   As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
   Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
   phiMn  = phi * Mn   =      76.1498  tonf-m./m.
   Mu                  =      19.3226  tonf-m./m.
   RatM   = Mu / phiMn =   0.254  <  1.0  --->  O.K !

<< TOP >>
```

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```
 -. Information of Parameters.
    Elem No.  : 1423
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      28.1685  tonf-m./m.
    RatM   = Mu / phiMn =   0.328  <  1.0  --->  O.K !

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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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=============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 4-[9], Dir 1.
=============================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ---------------------------------------------------------------------
  1.0000   1463 BOT 0.0016 0.0026 | 19.3281(   1) 76.1498 0.254  OK
           1428 TOP 0.0018 0.0026 | 27.7489(   1) 85.9474 0.323  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 1463
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      19.3281  tonf-m./m.
```

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Z-7

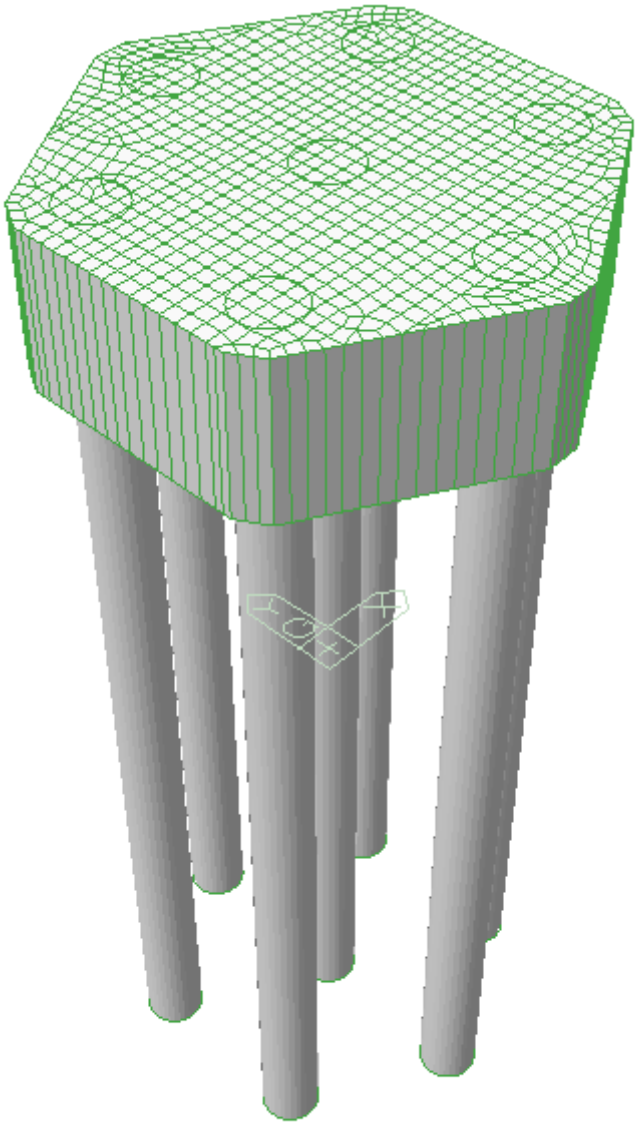


Ilustración 12: Modelo Matematico Z-7

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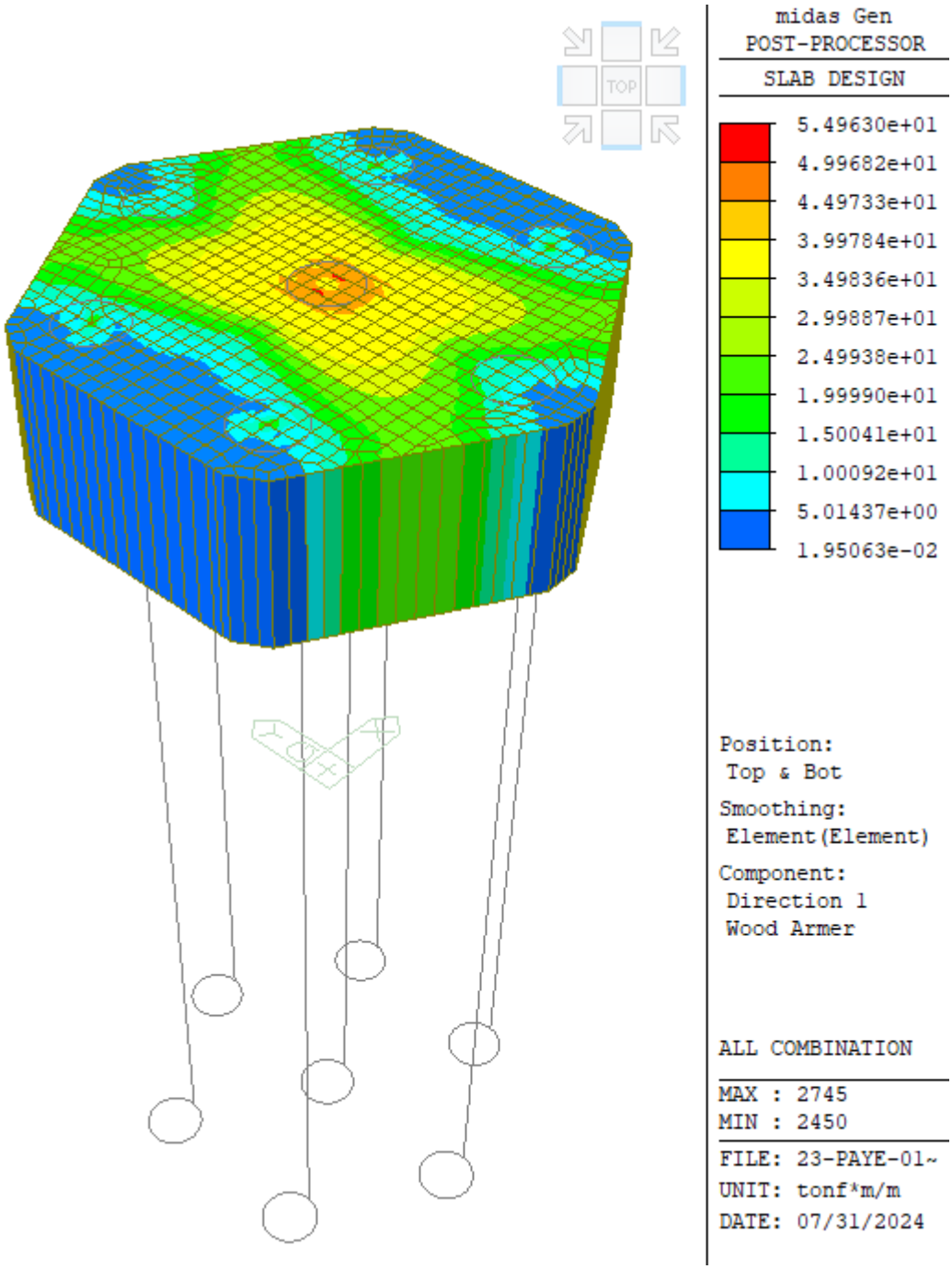


Ilustración 13: Solicitaciones de diseño

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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 5-[1], Dir 1.
============================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ---------------------------------------------------------------------
  1.0000   2049 BOT 0.0016 0.0026 | 22.7738(   1) 76.1498 0.299  OK
           2048 TOP 0.0018 0.0026 | 7.21134(   1) 85.9474 0.084  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 2049
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      22.7738  tonf-m./m.
    RatM   = Mu / phiMn =   0.299  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 2048
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
```

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```
    Mu                  =       7.2113  tonf-m./m.
    RatM   = Mu / phiMn =   0.084  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 5-[2], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   2064 BOT 0.0016 0.0026 | 22.7990(   1) 76.1498 0.299  OK
           2063 TOP 0.0018 0.0026 | 7.22699(   1) 85.9474 0.084  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 2064
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      22.7990  tonf-m./m.
    RatM   = Mu / phiMn =   0.299  <  1.0  --->  O.K !

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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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 << TOP >>

 -. Information of Parameters.
    Elem No.  : 2063
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
```

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```
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =       7.2270  tonf-m./m.
    RatM   = Mu / phiMn =   0.084  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 5-[3], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   2105 BOT 0.0016 0.0026 | 33.6702(   1) 76.1498 0.442  OK
           2107 TOP 0.0018 0.0026 | 22.5205(   1) 85.9474 0.262  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 2105
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      33.6702  tonf-m./m.
    RatM   = Mu / phiMn =   0.442  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 2107
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
```

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```
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      22.5205  tonf-m./m.
    RatM   = Mu / phiMn =   0.262  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 5-[4], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   2162 BOT 0.0016 0.0026 | 12.6078(   1) 76.1498 0.166  OK
           2147 TOP 0.0018 0.0026 | 17.7010(   1) 85.9474 0.206  OK
 ------------------------------------------------------------------


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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 2162
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      12.6078  tonf-m./m.
    RatM   = Mu / phiMn =   0.166  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 2147
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
```

```
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      17.7010  tonf-m./m.
    RatM   = Mu / phiMn =   0.206  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 5-[5], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   2176 BOT 0.0016 0.0026 | 4.29508(   1) 76.1498 0.056  OK
           2168 TOP 0.0018 0.0026 | 20.4480(   1) 85.9474 0.238  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 2176
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       4.2951  tonf-m./m.
    RatM   = Mu / phiMn =   0.056  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 2168
    Thickness :    1.0000 m.

--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.
```

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```
 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      20.4480  tonf-m./m.
    RatM   = Mu / phiMn =   0.238  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 5-[6], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   2204 BOT 0.0016 0.0026 | 4.64406(   1) 76.1498 0.061  OK
           2216 TOP 0.0018 0.0026 | 19.2698(   1) 85.9474 0.224  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 2204
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       4.6441  tonf-m./m.
    RatM   = Mu / phiMn =   0.061  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 2216
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
```

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```
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      19.2698  tonf-m./m.
    RatM   = Mu / phiMn =   0.224  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 5-[7], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   2235 BOT 0.0016 0.0026 | 12.1608(   1) 76.1498 0.160  OK
           2220 TOP 0.0018 0.0026 | 17.4849(   1) 85.9474 0.203  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 2235
    Thickness :    1.0000 m.

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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      12.1608  tonf-m./m.
    RatM   = Mu / phiMn =   0.160  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 2220
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
```

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```
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      17.4849  tonf-m./m.
    RatM   = Mu / phiMn =   0.203  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 5-[8], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   2284 BOT 0.0016 0.0026 | 31.9965(   1) 76.1498 0.420  OK
           2255 TOP 0.0018 0.0026 | 21.6780(   1) 85.9474 0.252  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 2284
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      31.9965  tonf-m./m.
    RatM   = Mu / phiMn =   0.420  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 2255
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.
```

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Z-9

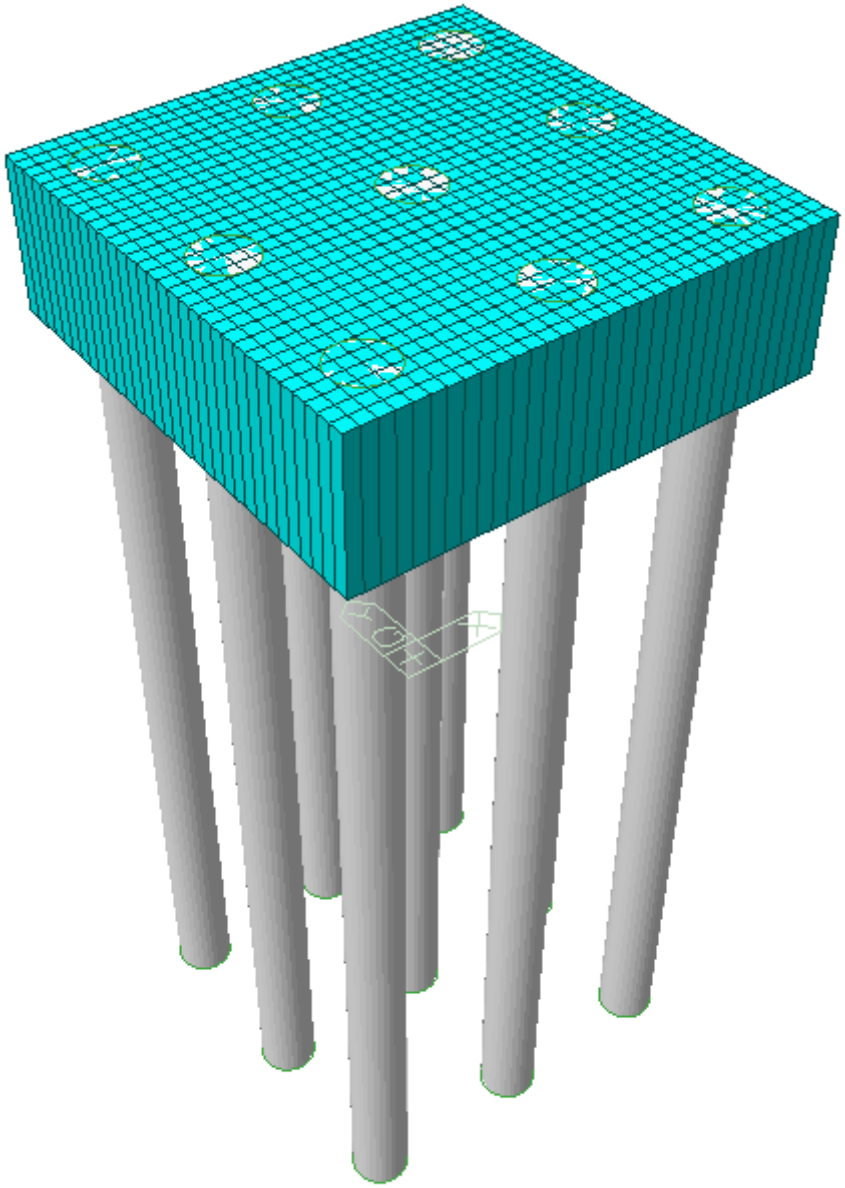
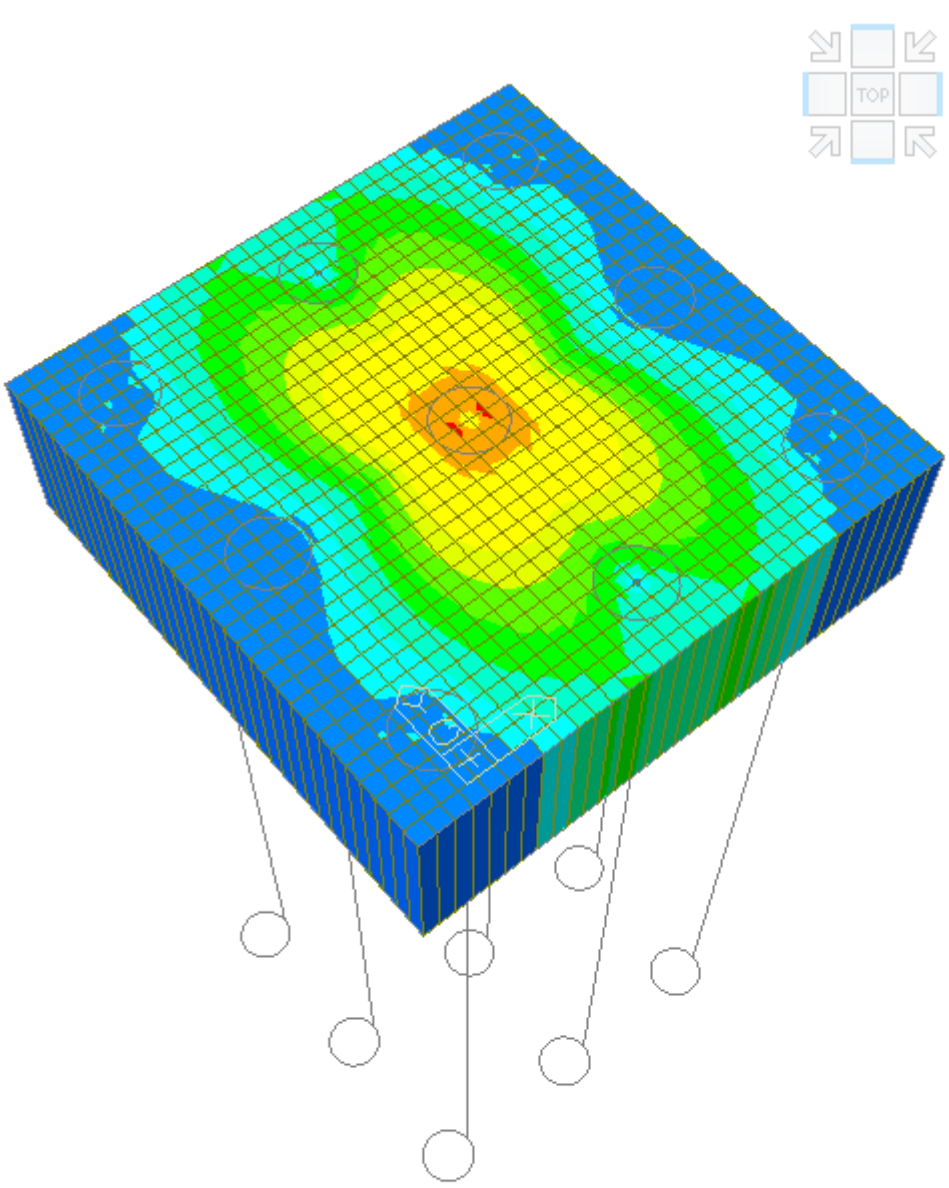


Ilustración 14: Modelo Matematico Z-9

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midas Gen
POST-PROCESSOR
SLAB DESIGN

9.07208e+01
8.24734e+01
7.42261e+01
6.59787e+01
5.77314e+01
4.94840e+01
4.12367e+01
3.29894e+01
2.47420e+01
1.64947e+01
8.24734e+00
0.00000e+00

Position:
Bottom Side
Smoothing:
Element(Element)
Component:
Direction 1
Wood Armer

ALL COMBINATION

MAX : 3579
MIN : 3131

FILE: 23-PAYE-01~
UNIT: tonf*m/m
DATE: 07/31/2024

Ilustración 15: Solicitaciones de diseño

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```
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 6-[1], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   3146 BOT 0.0016 0.0026 | 7.57466(   1) 76.1498 0.099  OK
           3146 TOP 0.0047 0.0039 | 152.413(   1) 127.248 1.20*  NG
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 3146
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       7.5747  tonf-m./m.
    RatM   = Mu / phiMn =   0.099  <  1.0  --->  O.K !


================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 6-[2], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   3159 BOT 0.0016 0.0026 | 32.2193(   1) 76.1498 0.423  OK
           3191 TOP 0.0018 0.0026 | 37.6549(   1) 85.9474 0.438  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 3159
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1
```

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```
 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      32.2193  tonf-m./m.
    RatM   = Mu / phiMn =   0.423  <  1.0  --->  O.K !

-------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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 << TOP >>

 -. Information of Parameters.
    Elem No.  : 3191
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      37.6549  tonf-m./m.
    RatM   = Mu / phiMn =   0.438  <  1.0  --->  O.K !

=============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 6-[3], Dir 1.
=============================================================================
 ---------------------------------------------------------------------
     Thk    Elem POS  AsReq  AsUse |      Mu( LCB)     pMn    Rat CHK
 ---------------------------------------------------------------------
  1.0000   3227 BOT 0.0016 0.0026 | 32.2193(   1) 76.1498 0.423  OK
           3195 TOP 0.0018 0.0026 | 37.6549(   1) 85.9474 0.438  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 3227
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
```

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```
                dT  =   0.1000 m.
   LCB No.   :    1

 -. Information of Design.
   phi    =   0.900
   b      =   0.0010 m.  (by Code Unit Length).
   d      =   0.8000 m.

 -. Information of Moments and Result.
   Rein. Bar :  #7 @150
   As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
   As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
   Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
   phiMn  = phi * Mn   =      76.1498  tonf-m./m.
   Mu                  =      32.2193  tonf-m./m.
   RatM   = Mu / phiMn =   0.423  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
   Elem No.  : 3195
   Thickness :    1.0000 m.
   Materials :  fc  =   2812.2792 tonf/m^2.
                Fy  =  42184.1879 tonf/m^2.
   Covering  :  dB  =   0.2000 m.
                dT  =   0.1000 m.
   LCB No.   :    1

 -. Information of Design.
   phi    =   0.900
   b      =   0.0010 m.  (by Code Unit Length).
   d      =   0.9000 m.

 -. Information of Moments and Result.
   Rein. Bar :  #7 @150
   As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
   As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
   Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
   phiMn  = phi * Mn   =      85.9474  tonf-m./m.
   Mu                  =      37.6549  tonf-m./m.
   RatM   = Mu / phiMn =   0.438  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 6-[4], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   3246 BOT 0.0016 0.0026 | 7.57466(   1) 76.1498 0.099  OK
           3246 TOP 0.0047 0.0039 | 152.413(   1) 127.248 1.20*  NG
 ------------------------------------------------------------------
```

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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 3246
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       7.5747  tonf-m./m.
    RatM   = Mu / phiMn =   0.099  <  1.0  --->  O.K !

===============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 6-[5], Dir 1.
===============================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ---------------------------------------------------------------------
  1.0000   3279 BOT 0.0016 0.0026 | 10.3366(   1) 76.1498 0.136  OK
           3303 TOP 0.0018 0.0026 | 35.8908(   1) 85.9474 0.418  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 3279
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
```

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```
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      10.3366  tonf-m./m.
    RatM   = Mu / phiMn =   0.136  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 3303
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      35.8908  tonf-m./m.
    RatM   = Mu / phiMn =   0.418  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 6-[6], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   3331 BOT 0.0016 0.0026 | 10.3366(   1) 76.1498 0.136  OK
           3307 TOP 0.0018 0.0026 | 35.8908(   1) 85.9474 0.418  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 3331
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      10.3366  tonf-m./m.
```

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```
    RatM   = Mu / phiMn =   0.136  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 3307
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      35.8908  tonf-m./m.
    RatM   = Mu / phiMn =   0.418  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 6-[7], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   3358 BOT 0.0016 0.0026 | 7.57465(   1) 76.1498 0.099  OK
           3358 TOP 0.0047 0.0039 | 152.413(   1) 127.248 1.20*  NG
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 3358
    Thickness :    1.0000 m.

-------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
===========================================================================================

    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
```

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```
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       7.5746  tonf-m./m.
    RatM   = Mu / phiMn =   0.099  <  1.0  --->  O.K !


================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 6-[8], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   3383 BOT 0.0016 0.0026 | 32.2194(   1) 76.1498 0.423  OK
           3415 TOP 0.0018 0.0026 | 37.6549(   1) 85.9474 0.438  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 3383
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      32.2194  tonf-m./m.
    RatM   = Mu / phiMn =   0.423  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 3415
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
```

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```
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      37.6549  tonf-m./m.
    RatM   = Mu / phiMn =   0.438  <  1.0  --->  O.K !

 ---------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
 =============================================================================================


 ===========================================================================
     [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 6-[9], Dir 1.
 ===========================================================================
  ---------------------------------------------------------------------
      Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
  ---------------------------------------------------------------------
   1.0000   3451 BOT 0.0016 0.0026 | 32.2194(   1) 76.1498 0.423  OK
            3419 TOP 0.0018 0.0026 | 37.6549(   1) 85.9474 0.438  OK
  ---------------------------------------------------------------------


  << BOTTOM >>

  -. Information of Parameters.
     Elem No.  : 3451
     Thickness :    1.0000 m.
     Materials :  fc  =   2812.2792 tonf/m^2.
                  Fy  =  42184.1879 tonf/m^2.
     Covering  :  dB  =   0.2000 m.
                  dT  =   0.1000 m.
     LCB No.   :    1

  -. Information of Design.
     phi    =   0.900
     b      =   0.0010 m.  (by Code Unit Length).
     d      =   0.8000 m.

  -. Information of Moments and Result.
     Rein. Bar :  #7 @150
     As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
     As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
     Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
     phiMn  = phi * Mn   =      76.1498  tonf-m./m.
     Mu                  =      32.2194  tonf-m./m.
     RatM   = Mu / phiMn =   0.423  <  1.0  --->  O.K !

  << TOP >>

  -. Information of Parameters.
     Elem No.  : 3419
     Thickness :    1.0000 m.
     Materials :  fc  =   2812.2792 tonf/m^2.
                  Fy  =  42184.1879 tonf/m^2.
     Covering  :  dB  =   0.2000 m.
                  dT  =   0.1000 m.
     LCB No.   :    1

  -. Information of Design.
     phi    =   0.900
     b      =   0.0010 m.  (by Code Unit Length).
     d      =   0.9000 m.

  -. Information of Moments and Result.
     Rein. Bar :  #7 @150
```

```
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      37.6549  tonf-m./m.
    RatM   = Mu / phiMn =   0.438  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 6-[10], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   3470 BOT 0.0016 0.0026 | 7.57465(   1) 76.1498 0.099  OK
           3470 TOP 0.0047 0.0039 | 152.413(   1) 127.248 1.20*  NG
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 3470
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       7.5746  tonf-m./m.
    RatM   = Mu / phiMn =   0.099  <  1.0  --->  O.K !
```

Z-10

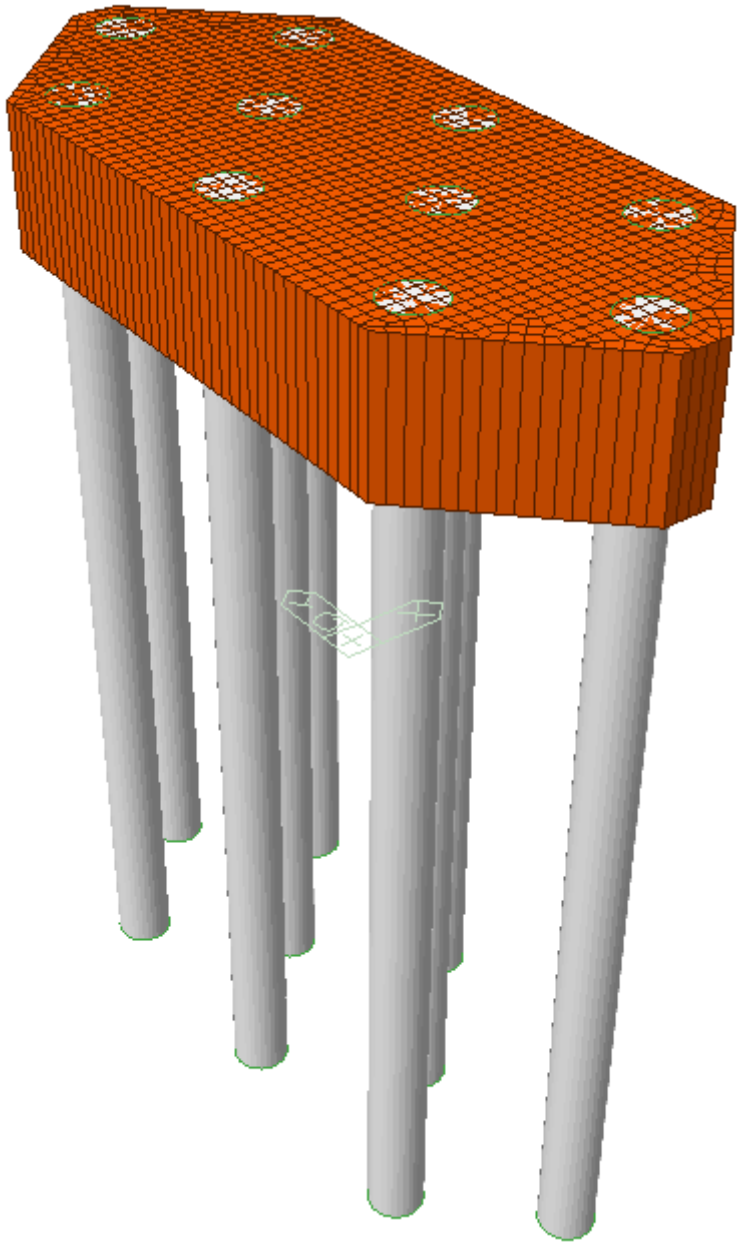


Ilustración 16: Modelo Matematico Z-10

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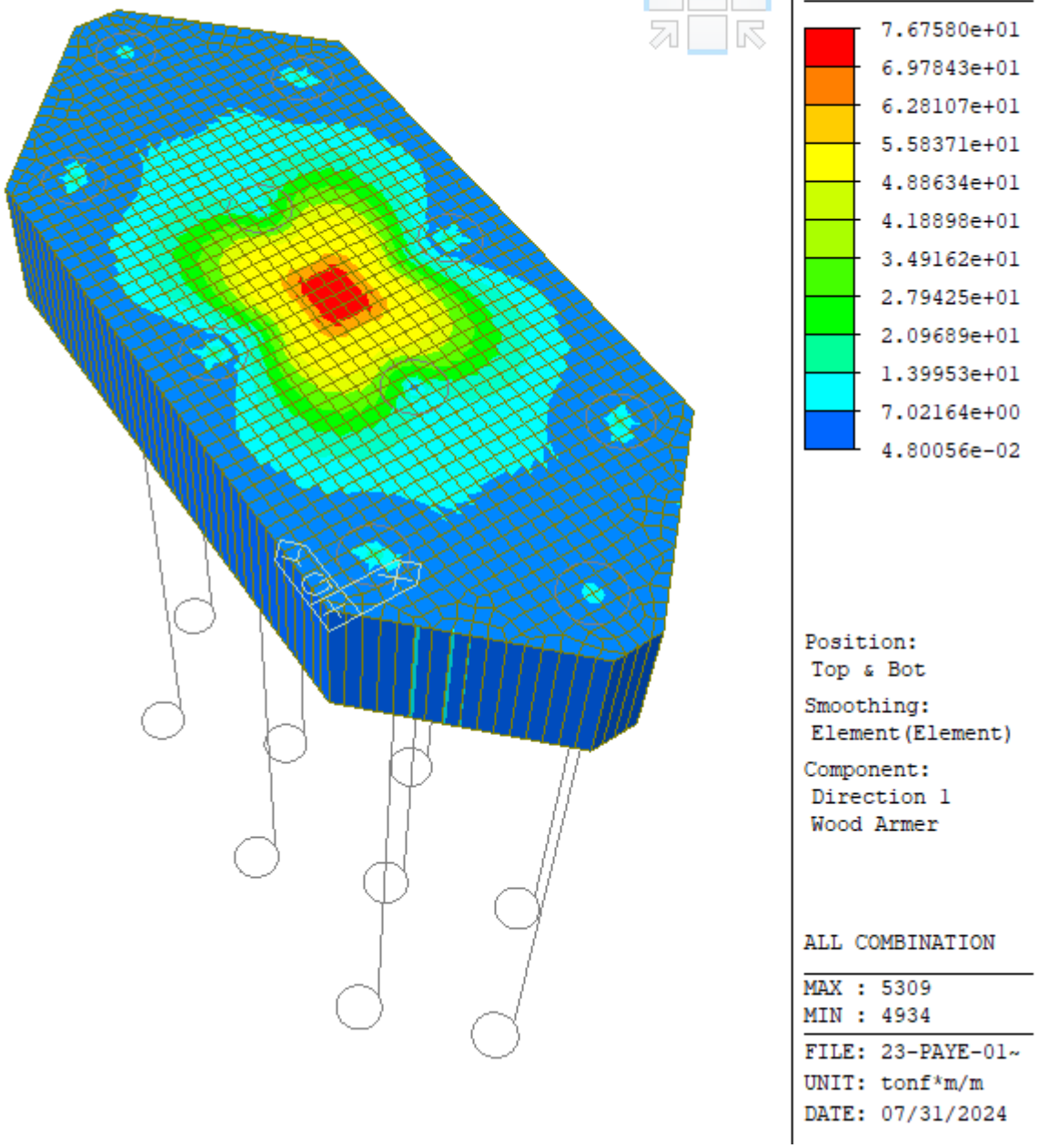


Ilustración 17: Solicitaciones de diseño

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```
------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
==========================================================================================


==========================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 7-[1], Dir 1.
==========================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   4336 BOT 0.0016 0.0026 | 5.13914(   1) 76.1498 0.067  OK
           4337 TOP 0.0018 0.0026 | 14.3764(   1) 85.9474 0.167  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 4336
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       5.1391  tonf-m./m.
    RatM   = Mu / phiMn =   0.067  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 4337
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
```

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```
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      14.3764  tonf-m./m.
    RatM   = Mu / phiMn =   0.167  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 7-[2], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   4349 BOT 0.0016 0.0026 | 5.14109(   1) 76.1498 0.068  OK
           4356 TOP 0.0018 0.0026 | 14.3626(   1) 85.9474 0.167  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 4349
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       5.1411  tonf-m./m.
    RatM   = Mu / phiMn =   0.068  <  1.0  --->  O.K !

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 << TOP >>

 -. Information of Parameters.
    Elem No.  : 4356
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
```

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```
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      14.3626  tonf-m./m.
    RatM   = Mu / phiMn =   0.167  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 7-[3], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   4382 BOT 0.0016 0.0026 | 7.44638(   1) 76.1498 0.098  OK
           4401 TOP 0.0018 0.0026 | 22.7654(   1) 85.9474 0.265  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 4382
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       7.4464  tonf-m./m.
    RatM   = Mu / phiMn =   0.098  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 4401
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
```

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```
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      22.7654  tonf-m./m.
    RatM   = Mu / phiMn =   0.265  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 7-[4], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   4457 BOT 0.0016 0.0026 | 7.57335(   1) 76.1498 0.099  OK
           4439 TOP 0.0018 0.0026 | 17.4081(   1) 85.9474 0.203  OK
 ------------------------------------------------------------------


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 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 4457
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =       7.5734  tonf-m./m.
    RatM   = Mu / phiMn =   0.099  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 4439
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.
```

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```
 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      17.4081  tonf-m./m.
    RatM   = Mu / phiMn =   0.203  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 7-[5], Dir 1.
================================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ---------------------------------------------------------------------
  1.0000   4458 BOT 0.0016 0.0026 | 11.0230(   1) 76.1498 0.145  OK
           4490 TOP 0.0018 0.0026 | 20.4343(   1) 85.9474 0.238  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 4458
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      11.0230  tonf-m./m.
    RatM   = Mu / phiMn =   0.145  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 4490
    Thickness :    1.0000 m.

--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
============================================================================================

    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
```

```
   b      =   0.0010 m.  (by Code Unit Length).
   d      =   0.9000 m.

-. Information of Moments and Result.
   Rein. Bar :  #7 @150
   As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
   As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
   Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
   phiMn  = phi * Mn   =      85.9474  tonf-m./m.
   Mu                  =      20.4343  tonf-m./m.
   RatM   = Mu / phiMn =   0.238  <  1.0  --->  O.K !

================================================================================
   [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 7-[6], Dir 1.
================================================================================
 ------------------------------------------------------------------
    Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
 1.0000   4518 BOT 0.0016 0.0026 | 13.3045(   1) 76.1498 0.175  OK
          4494 TOP 0.0018 0.0026 | 20.9249(   1) 85.9474 0.243  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
   Elem No.  : 4518
   Thickness :    1.0000 m.
   Materials :  fc  =   2812.2792 tonf/m^2.
                Fy  =  42184.1879 tonf/m^2.
   Covering  :  dB  =   0.2000 m.
                dT  =   0.1000 m.
   LCB No.   :    1

 -. Information of Design.
   phi    =   0.900
   b      =   0.0010 m.  (by Code Unit Length).
   d      =   0.8000 m.

 -. Information of Moments and Result.
   Rein. Bar :  #7 @150
   As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
   As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
   Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
   phiMn  = phi * Mn   =      76.1498  tonf-m./m.
   Mu                  =      13.3045  tonf-m./m.
   RatM   = Mu / phiMn =   0.175  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
   Elem No.  : 4494
   Thickness :    1.0000 m.
   Materials :  fc  =   2812.2792 tonf/m^2.
                Fy  =  42184.1879 tonf/m^2.
   Covering  :  dB  =   0.2000 m.
                dT  =   0.1000 m.
   LCB No.   :    1

 -. Information of Design.
   phi    =   0.900
   b      =   0.0010 m.  (by Code Unit Length).
   d      =   0.9000 m.
```

```
 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      20.9249  tonf-m./m.
    RatM   = Mu / phiMn =   0.243  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 7-[7], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   4538 BOT 0.0016 0.0026 | 13.3044(   1) 76.1498 0.175  OK
           4562 TOP 0.0018 0.0026 | 20.9249(   1) 85.9474 0.243  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 4538
    Thickness :    1.0000 m.
```

Z-11

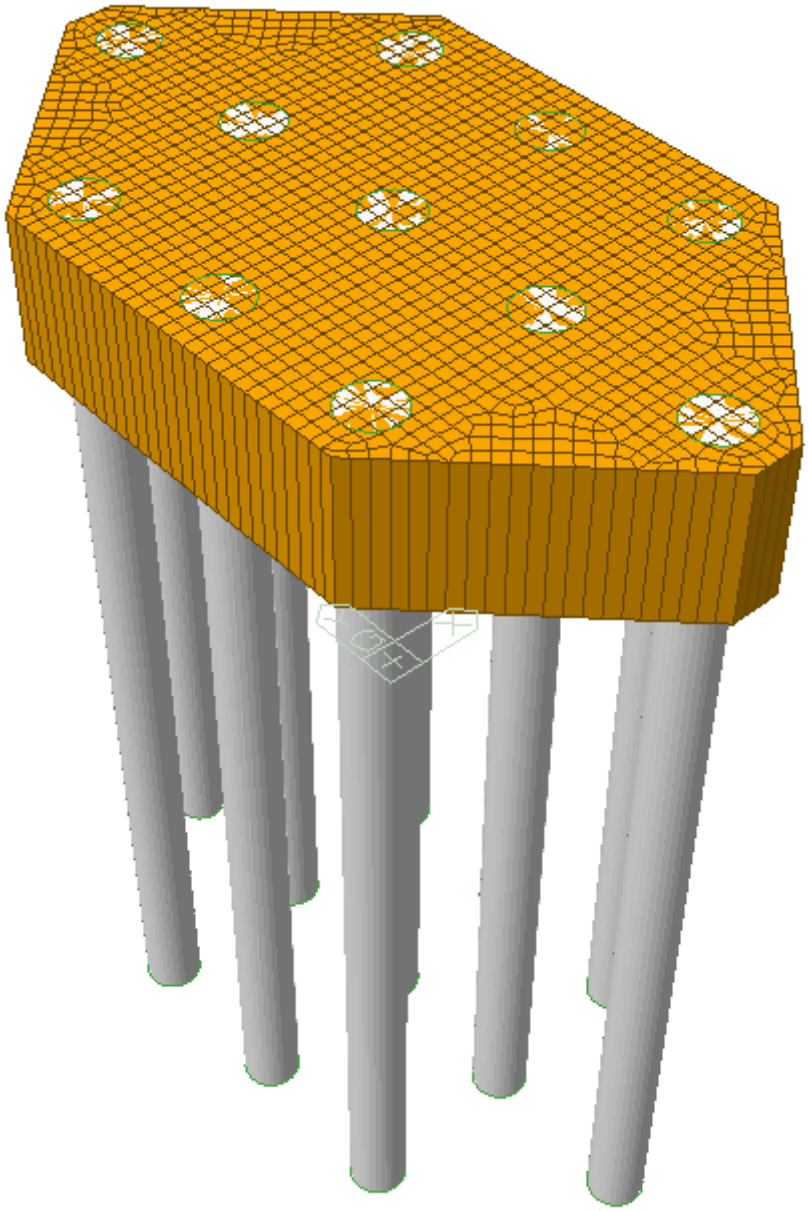


Ilustración 18: Modelo Matematico Z-11

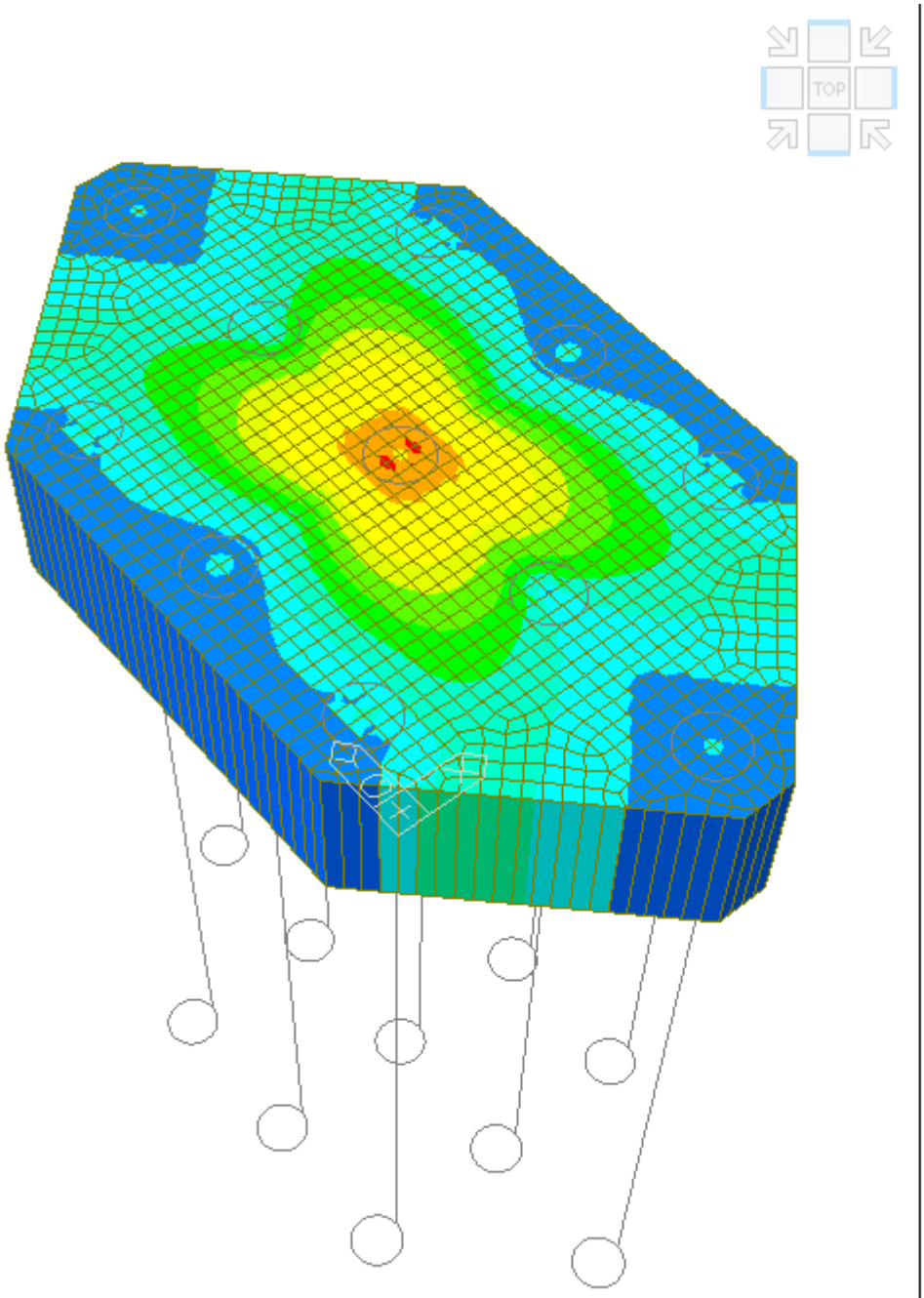


Ilustración 19: Solicitaciones de diseño

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```
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=============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 8-[1], Dir 1.
=============================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ---------------------------------------------------------------------
  1.0000   6128 BOT 0.0016 0.0026 | 10.2231(   1) 76.1498 0.134  OK
           6129 TOP 0.0018 0.0026 | 17.3054(   1) 85.9474 0.201  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 6128
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      10.2231  tonf-m./m.
    RatM   = Mu / phiMn =   0.134  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 6129
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
```

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```
    Mu                  =      17.3054  tonf-m./m.
    RatM   = Mu / phiMn =   0.201  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 8-[2], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   6140 BOT 0.0016 0.0026 | 10.2151(   1) 76.1498 0.134  OK
           6148 TOP 0.0018 0.0026 | 17.2888(   1) 85.9474 0.201  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 6140
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      10.2151  tonf-m./m.
    RatM   = Mu / phiMn =   0.134  <  1.0  --->  O.K !

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 -. Information of Parameters.
    Elem No.  : 6148
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
```

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```
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      17.2888  tonf-m./m.
    RatM   = Mu / phiMn =   0.201  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 8-[3], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   6175 BOT 0.0016 0.0026 | 36.8530(   1) 76.1498 0.484  OK
           6179 TOP 0.0018 0.0026 | 32.0620(   1) 85.9474 0.373  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 6175
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      36.8530  tonf-m./m.
    RatM   = Mu / phiMn =   0.484  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 6179
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
```

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```
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      32.0620  tonf-m./m.
    RatM   = Mu / phiMn =   0.373  <  1.0  --->  O.K !

=============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 8-[4], Dir 1.
=============================================================================
 ---------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ---------------------------------------------------------------
  1.0000   6301 BOT 0.0016 0.0026 | 21.9831(   1) 76.1498 0.289  OK
           6283 TOP 0.0018 0.0026 | 24.7339(   1) 85.9474 0.288  OK
 ---------------------------------------------------------------


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 -. Information of Parameters.
    Elem No.  : 6301
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      21.9831  tonf-m./m.
    RatM   = Mu / phiMn =   0.289  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 6283
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
```

```
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      24.7339  tonf-m./m.
    RatM   = Mu / phiMn =   0.288  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 8-[5], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   6330 BOT 0.0016 0.0026 | 13.1910(   1) 76.1498 0.173  OK
           6346 TOP 0.0018 0.0026 | 29.2989(   1) 85.9474 0.341  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 6330
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      13.1910  tonf-m./m.
    RatM   = Mu / phiMn =   0.173  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 6346
    Thickness :    1.0000 m.
```

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    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      29.2989  tonf-m./m.
    RatM   = Mu / phiMn =   0.341  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 8-[6], Dir 1.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   6366 BOT 0.0016 0.0026 | 13.1911(   1) 76.1498 0.173  OK
           6350 TOP 0.0018 0.0026 | 29.3047(   1) 85.9474 0.341  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 6366
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      13.1911  tonf-m./m.
    RatM   = Mu / phiMn =   0.173  <  1.0  --->  O.K !

 << TOP >>
```

```
 -. Information of Parameters.
    Elem No.  : 6350
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      29.3047  tonf-m./m.
    RatM   = Mu / phiMn =   0.341  <  1.0  --->  O.K !

=============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 8-[7], Dir 1.
=============================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ---------------------------------------------------------------------
  1.0000   6410 BOT 0.0016 0.0026 | 21.9806(   1) 76.1498 0.289  OK
           6408 TOP 0.0018 0.0026 | 24.6711(   1) 85.9474 0.287  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 6410
    Thickness :    1.0000 m.
```

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```
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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      21.9806  tonf-m./m.
    RatM   = Mu / phiMn =   0.289  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 6408
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      24.6711  tonf-m./m.
    RatM   = Mu / phiMn =   0.287  <  1.0  --->  O.K !
```

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Z-12

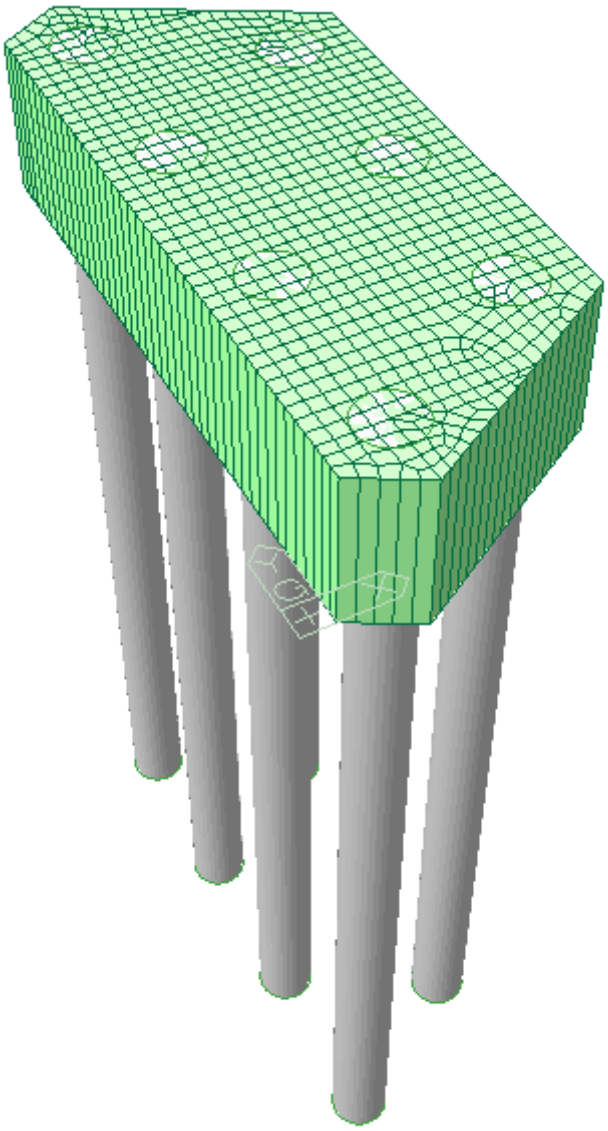


Ilustración 20: Modelo Matematico Z-12

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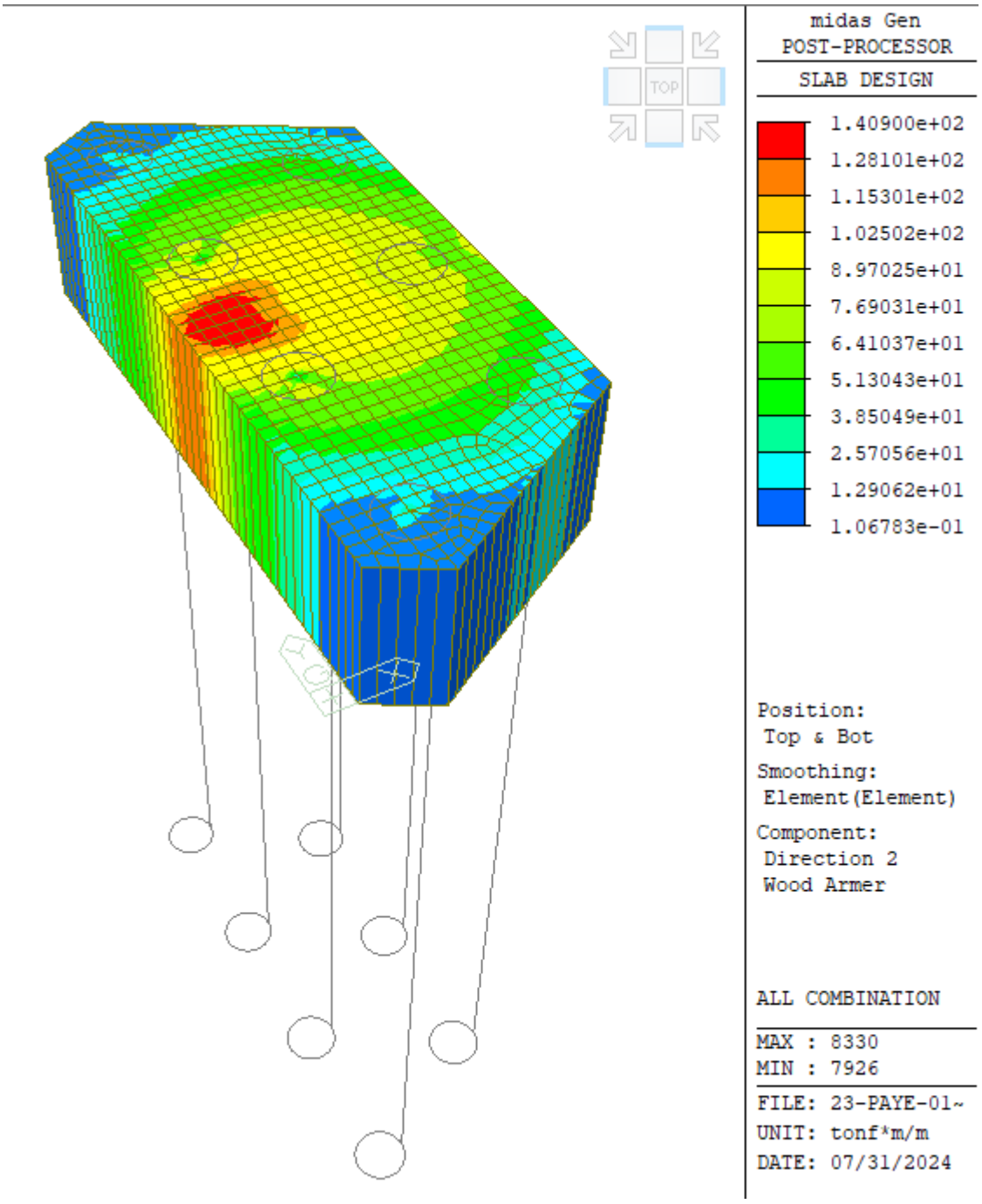


Ilustración 21: Solicitaciones de diseño

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```
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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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=========================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 9-[1], Dir 2.
=========================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ---------------------------------------------------------------------
  1.0000   7923 BOT 0.0016 0.0026 | 17.5802(   1) 76.1498 0.231  OK
           7899 TOP 0.0018 0.0026 | 29.3658(   1) 85.9474 0.342  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 7923
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      17.5802  tonf-m./m.
    RatM   = Mu / phiMn =   0.231  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 7899
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
```

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```
    Mu                  =      29.3658  tonf-m./m.
    RatM   = Mu / phiMn =   0.342  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 9-[2], Dir 2.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   7984 BOT 0.0016 0.0026 | 48.6621(   1) 76.1498 0.639  OK
           7978 TOP 0.0018 0.0026 | 42.1669(   1) 85.9474 0.491  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 7984
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      48.6621  tonf-m./m.
    RatM   = Mu / phiMn =   0.639  <  1.0  --->  O.K !
```

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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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 << TOP >>

 -. Information of Parameters.
    Elem No.  : 7978
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      42.1669  tonf-m./m.
    RatM   = Mu / phiMn =   0.491  <  1.0  --->  O.K !

=============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 9-[3], Dir 2.
=============================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ---------------------------------------------------------------------
  1.0000   8000 BOT 0.0016 0.0026 | 40.9215(   1) 76.1498 0.537  OK
           8011 TOP 0.0009 0.0026 | 2.85832(   1) 85.9474 0.033  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 8000
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
```

```
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      40.9215  tonf-m./m.
    RatM   = Mu / phiMn =   0.537  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 8011
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0009 m^2/m.  (       0.0009 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =       2.8583  tonf-m./m.
    RatM   = Mu / phiMn =   0.033  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 9-[4], Dir 2.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   8037 BOT 0.0021 0.0026 | 61.3866(   1) 76.1498 0.806  OK
           8037 TOP 0.0000 0.0026 | 0.00000(   1) 85.9474 0.000  OK
 ------------------------------------------------------------------
```

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```
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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 8037
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0021 m^2/m.  (       0.0021 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      61.3866  tonf-m./m.
    RatM   = Mu / phiMn =   0.806  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 8037
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0000 m^2/m.  (       0.0000 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =       0.0000  tonf-m./m.
    RatM   = Mu / phiMn =   0.000  <  1.0  --->  O.K !

============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 9-[5], Dir 2.
============================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   8061 BOT 0.0023 0.0026 | 69.0844(   1) 76.1498 0.907  OK
```

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```
          8061 TOP 0.0000 0.0026 | 0.00000(   1) 85.9474 0.000  OK
-----------------------------------------------------------------------


<< BOTTOM >>

-. Information of Parameters.
   Elem No.  : 8061
   Thickness :    1.0000 m.
   Materials :  fc  =   2812.2792 tonf/m^2.
                Fy  =  42184.1879 tonf/m^2.
   Covering  :  dB  =   0.2000 m.
                dT  =   0.1000 m.
   LCB No.   :    1

-. Information of Design.
   phi    =   0.900
   b      =   0.0010 m.  (by Code Unit Length).
   d      =   0.8000 m.

-. Information of Moments and Result.
   Rein. Bar :  #7 @150
   As_req =       0.0023 m^2/m.  (       0.0023 m^2/m.)
   As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
   Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
   phiMn  = phi * Mn   =      76.1498  tonf-m./m.
   Mu                  =      69.0844  tonf-m./m.
   RatM   = Mu / phiMn =   0.907  <  1.0  --->  O.K !

<< TOP >>

-. Information of Parameters.
   Elem No.  : 8061
   Thickness :    1.0000 m.
```

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Z-13

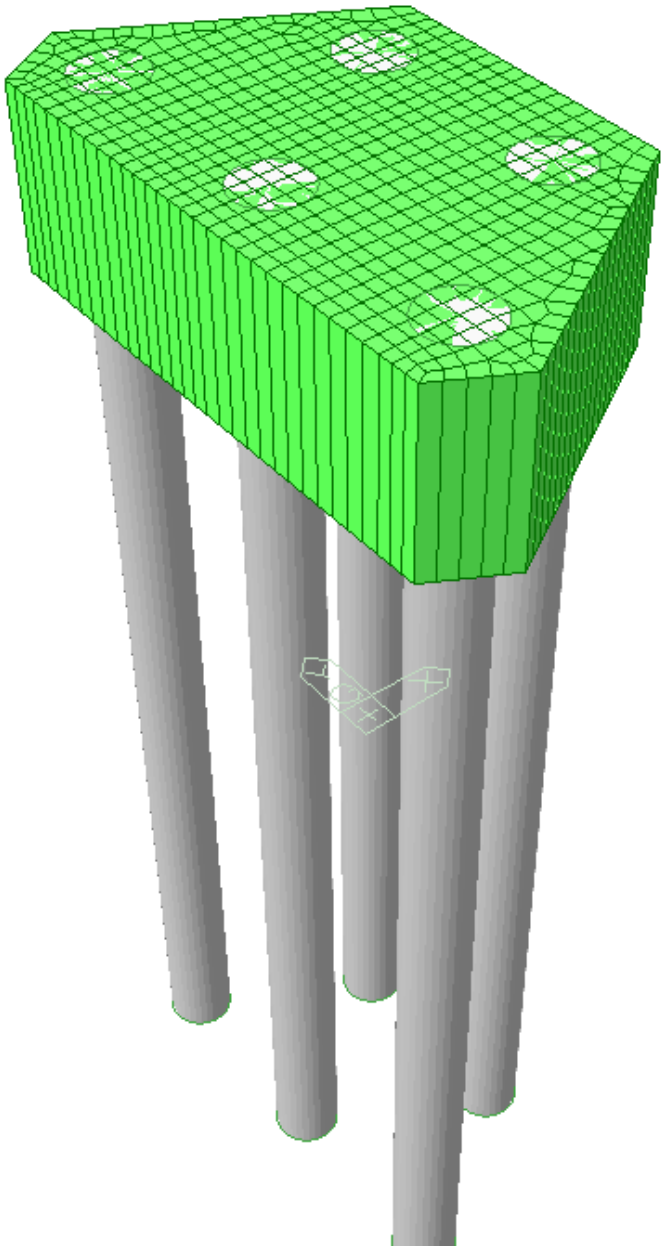


Ilustración 22: Modelo Matematico Z-13

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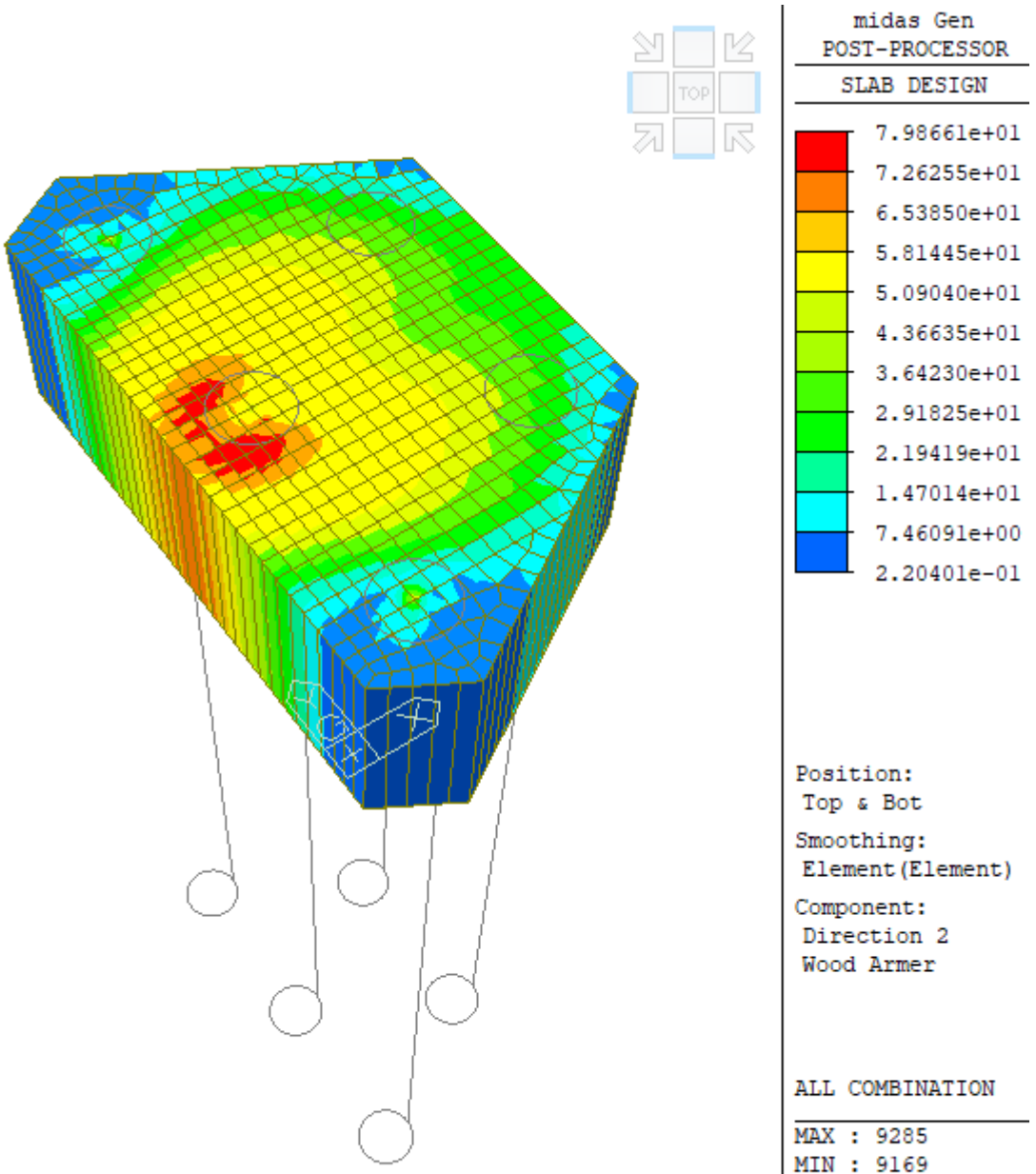


Ilustración 23: Solicitaciones de diseño

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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
==========================================================================================


============================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 10-[1], Dir 2.
============================================================================
 ---------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ---------------------------------------------------------------------
  1.0000   8950 BOT 0.0016 0.0026 | 19.7574(   1) 76.1498 0.259  OK
           8939 TOP 0.0018 0.0026 | 27.1422(   1) 85.9474 0.316  OK
 ---------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 8950
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      19.7574  tonf-m./m.
    RatM   = Mu / phiMn =   0.259  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 8939
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
```

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```
    Mu                  =      27.1422  tonf-m./m.
    RatM   = Mu / phiMn =   0.316  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 10-[2], Dir 2.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   8954 BOT 0.0018 0.0026 | 53.1533(   1) 76.1498 0.698  OK
           8958 TOP 0.0018 0.0026 | 43.3255(   1) 85.9474 0.504  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 8954
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      53.1533  tonf-m./m.
    RatM   = Mu / phiMn =   0.698  <  1.0  --->  O.K !

--------------------------------------------------------------------------------------------
 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
============================================================================================


 << TOP >>

 -. Information of Parameters.
    Elem No.  : 8958
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0018 m^2/m.  (       0.0018 m^2/m.)
```

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```
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =      43.3255  tonf-m./m.
    RatM   = Mu / phiMn =   0.504  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 10-[3], Dir 2.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   9021 BOT 0.0016 0.0026 | 29.4651(   1) 76.1498 0.387  OK
           9018 TOP 0.0009 0.0026 | 1.94373(   1) 85.9474 0.023  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 9021
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      29.4651  tonf-m./m.
    RatM   = Mu / phiMn =   0.387  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 9018
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0009 m^2/m.  (       0.0009 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
```

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```
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =       1.9437  tonf-m./m.
    RatM   = Mu / phiMn =   0.023  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 10-[4], Dir 2.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   9054 BOT 0.0016 0.0026 | 35.0072(   1) 76.1498 0.460  OK
           9057 TOP 0.0000 0.0026 | 0.00000(   1) 85.9474 0.000  OK
 ------------------------------------------------------------------


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 midas Gen - RC-Slab Flexural Design     [ NSR-10 ]                          Gen 2021
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 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 9054
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      35.0072  tonf-m./m.
    RatM   = Mu / phiMn =   0.460  <  1.0  --->  O.K !

 << TOP >>

 -. Information of Parameters.
    Elem No.  : 9057
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.9000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
```

```
    As_req =       0.0000 m^2/m.  (       0.0000 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =       0.0000  tonf-m./m.
    RatM   = Mu / phiMn =   0.000  <  1.0  --->  O.K !

================================================================================
    [[[*]]]   SLAB DESIGN MAXIMUM RESULT DATA : DOMAIN 10-[5], Dir 2.
================================================================================
 ------------------------------------------------------------------
     Thk   Elem POS  AsReq  AsUse |      Mu( LCB)     pMn   Rat CHK
 ------------------------------------------------------------------
  1.0000   9058 BOT 0.0016 0.0026 | 35.6834(   1) 76.1498 0.469  OK
           9085 TOP 0.0000 0.0026 | 0.00000(   1) 85.9474 0.000  OK
 ------------------------------------------------------------------


 << BOTTOM >>

 -. Information of Parameters.
    Elem No.  : 9058
    Thickness :    1.0000 m.
    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi    =   0.900
    b      =   0.0010 m.  (by Code Unit Length).
    d      =   0.8000 m.

 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0016 m^2/m.  (       0.0016 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      84.6109  tonf-m./m.
    phiMn  = phi * Mn   =      76.1498  tonf-m./m.
    Mu                  =      35.6834  tonf-m./m.
    RatM   = Mu / phiMn =   0.469  <  1.0  --->  O.K !

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 -. Information of Parameters.
    Elem No.  : 9085
    Thickness :    1.0000 m.
```

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```
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    Materials :  fc  =   2812.2792 tonf/m^2.
                 Fy  =  42184.1879 tonf/m^2.
    Covering  :  dB  =   0.2000 m.
                 dT  =   0.1000 m.
    LCB No.   :    1

 -. Information of Design.
    phi     =   0.900
    b       =   0.0010 m.  (by Code Unit Length).
    d       =   0.9000 m.

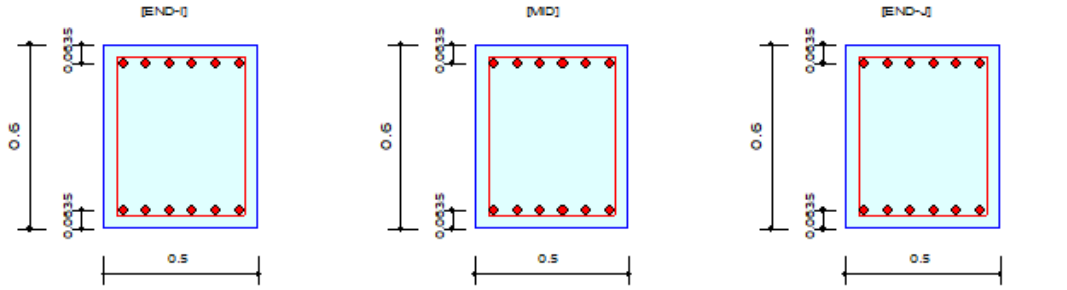
 -. Information of Moments and Result.
    Rein. Bar :  #7 @150
    As_req =       0.0000 m^2/m.  (       0.0000 m^2/m.)
    As_use =       0.0026 m^2/m.  (       0.0026 m^2/m.)
    Mn     = As_use*Fy*[d-As_use*Fy/(1.7*fc*b)] =      95.4972  tonf-m./m.
    phiMn  = phi * Mn   =      85.9474  tonf-m./m.
    Mu                  =       0.0000  tonf-m./m.
    RatM   = Mu / phiMn =   0.000  <  1.0  --->  O.K !
.384  <  1.0  --->  O.K !
```

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VIGA R-01

1. Design Information

Member Number	1102		
Design Code	NSR-10	Unit System	tonf, m
Material Data	fc = 2812.28, fy = 42184.2, fys = 42184.2 tonf/m^2		
Section Property	R-01(50X60) (No : 14)	Beam Span	8.32421m



2. Bending Moment Capacity

	END-I	MID	END-J
(-) Load Combination No.	1	26	1
Moment (Mu)	13.51	0.00	13.51
Factored Strength (PhiMn)	32.66	32.66	32.66
Check Ratio (Mu/PhiMn)	0.4135	0.0000	0.4135
(+) Load Combination No.	1	1	1
Moment (Mu)	1.69	6.75	1.69
Factored Strength (PhiMn)	32.66	32.66	32.66
Check Ratio (Mu/PhiMn)	0.0517	0.2068	0.0517
Using Rebar Top (As_top)	0.0017	0.0017	0.0017
Using Rebar Bot (As_bot)	0.0017	0.0017	0.0017

3. Shear Capacity

	END-I	MID	END-J
Load Combination No.	1	1	1
Factored Shear Force (Vu)	9.74	4.87	9.74
Shear Strength by Conc.(PhiVc)	18.32	18.32	18.32
Shear Strength by Rebar.(PhiVs)	12.05	12.05	12.05
Using Shear Reinf. (AsV)	0.0007	0.0007	0.0007
Using Stirrups Spacing	2-#3 @200	2-#3 @200	2-#3 @200
Check Ratio	0.3207	0.1603	0.3207

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midas Gen - RC-Beam Checking [NSR-10] Gen 2021

```
+============================================================+
|  MIDAS(Modeling, Integrated Design & Analysis Software)    |
|  midas Gen - Design & checking system for windows          |
+============================================================+
|  RC-Member(Beam/Column/Brace/Wall) Analysis and Design      |
|  Based On  Eurocode2:04, Eurocode2, ACI318-14,             |
|            ACI318M-14, ACI318-11, ACI318-08, ACI318-05,    |
|            ACI318-02, ACI318-99, ACI318-95, ACI318-89,     |
|            NSR-10, CSA-A23.3-94, BS8110-97, NSCP 2015      |
|                                                            |
|                                                            |
|                                                            |
|                                                            |
|                                          (c)SINCE 1989  |
+============================================================+
|  MIDAS Information Technology Co.,Ltd.         (MIDAS IT)  |
|  MIDAS IT Design Development Team                          |
+============================================================+
|            HomePage : www.MidasUser.com                    |
+============================================================+
|  Gen 2021                                                  |
+============================================================+
```

*. DEFINITION OF LOAD COMBINATIONS WITH SCALING UP FACTORS.

LCB	C	Loadcase Name(Factor) + Loadcase Name(Factor) + Loadcase Name(Factor)
1	1	PP(1.400) + SCP(1.400)
2	1	PP(1.200) + SCP(1.200) + CV(1.600)
3	1	PP(1.200) + SCP(1.200) + VX(1.000)
	+	CV(1.000)
4	1	PP(1.200) + SCP(1.200) + VY(1.000)
	+	CV(1.000)
5	1	PP(1.200) + SCP(1.200) + VX(-1.000)
	+	CV(1.000)
6	1	PP(1.200) + SCP(1.200) + VY(-1.000)
	+	CV(1.000)
7	1	PP(1.200) + SCP(1.200) + EX(RS)(0.244)
	+	EX(ES)(0.244) + CV(1.000)
8	1	PP(1.200) + SCP(1.200) + EX(RS)(0.244)
	+	EX(ES)(-0.244) + CV(1.000)
9	1	PP(1.200) + SCP(1.200) + EY(RS)(0.244)
	+	EY(ES)(0.244) + CV(1.000)
10	1	PP(1.200) + SCP(1.200) + EY(RS)(0.244)
	+	EY(ES)(-0.244) + CV(1.000)
11	1	PP(1.200) + SCP(1.200) + EX(RS)(-0.244)
	+	EX(ES)(-0.244) + CV(1.000)
12	1	PP(1.200) + SCP(1.200) + EX(RS)(-0.244)
	+	EX(ES)(0.244) + CV(1.000)
13	1	PP(1.200) + SCP(1.200) + EY(RS)(-0.244)
	+	EY(ES)(-0.244) + CV(1.000)

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14	1		PP(1.200) +	SCP(1.200) +	EY(RS)(-0.244)	
		+	EY(ES)(0.244) +	CV(1.000)		
15	1		PP(0.900) +	SCP(0.900) +	VX(1.000)	
16	1		PP(0.900) +	SCP(0.900) +	VY(1.000)	
17	1		PP(0.900) +	SCP(0.900) +	VX(-1.000)	
18	1		PP(0.900) +	SCP(0.900) +	VY(-1.000)	
19	1		PP(0.900) +	SCP(0.900) +	EX(RS)(0.244)	
		+	EX(ES)(0.244)			
20	1		PP(0.900) +	SCP(0.900) +	EX(RS)(0.244)	
		+	EX(ES)(-0.244)			
21	1		PP(0.900) +	SCP(0.900) +	EY(RS)(0.244)	
		+	EY(ES)(0.244)			
22	1		PP(0.900) +	SCP(0.900) +	EY(RS)(0.244)	
		+	EY(ES)(-0.244)			
23	1		PP(0.900) +	SCP(0.900) +	EX(RS)(-0.244)	
		+	EX(ES)(-0.244)			
24	1		PP(0.900) +	SCP(0.900) +	EX(RS)(-0.244)	
		+	EX(ES)(0.244)			
25	1		PP(0.900) +	SCP(0.900) +	EY(RS)(-0.244)	
		+	EY(ES)(-0.244)			
26	1		PP(0.900) +	SCP(0.900) +	EY(RS)(-0.244)	
		+	EY(ES)(0.244)			

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 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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      *.midas Gen - RC-BEAM Analysis/Design Program.

      *.PROJECT       :
      *.DESIGN CODE   : NSR-10,         *.UNIT SYSTEM : tonf, m
        (Note. Nonhomogenous equation in the code are written in SI units in the report)
      *.MEMBER        : Member Type = BEAM,   MEMB =  1102

      *.DESCRIPTION OF BEAM DATA (iSEC =    14) : R-01(50X60)
        Section Type : Rectangle (RECT)
        Beam Length (Span)             =         8.324 m.
        Section Depth (Hc)             =         0.600 m.
        Section Width (Bc)             =         0.500 m.
        Concrete Strength (fc)         =      2812.279 tonf/m^2.
        Modulus of Elasticity (Ec)     =   2516904.499 tonf/m^2.
        Main Rebar Strength (fy)       =     42184.188 tonf/m^2.
        Stirrups Strength (fys)        =     42184.188 tonf/m^2.
        Modulus of Elasticity (Es)     =  20394324.260 tonf/m^2.

      *.DESCRIPTION OF APPLIED FACTORS FOR DESIGN/CHECKING.
        Special Provisions For Seismic Design : Moderate Energy Dissipation (DMO).
         -. Seismic Scale Up Factor for Shear (a1) = 1.000
         -. Seismic Scale Up Factor for Shear (a2) = 2.000
         -. Applied Scale Up Factor for Shear = MIN[Shear by a1, Shear by a2]
        Members for Non-Seismic Design.

      *.FORCES AND MOMENTS AT CHECK POINT <I> :
        Positive Bending Moment   P-Mu =        1.69 tonf-m.,  LCB =   1
        Negative Bending Moment   N-Mu =       13.51 tonf-m.,  LCB =   1
        Shear Force                Vu  =        9.74 tonf.  ,  LCB =   1

      *.REINFORCEMENT PATTERN :
        ---------------------------------------------------------
           Location    i     di( m.)       Rebar    Asi( m^2.)
        ---------------------------------------------------------
           Top         1      0.064         6-#6      0.00170
           Bottom      2      0.536         6-#6      0.00170
        ---------------------------------------------------------
           Stirrups : #3

 ===========================================================================
    [[[*]]]   ANALYZE POSITIVE BENDING MOMENT CAPACITY.
 ===========================================================================

      ( ). Compute design parameter.
           -. beta1  = 0.8500  ( fc < 28 MPa.)

      ( ). Check spacing of reinforcement closet to the tensile face.
           -. fs   = (2/3)*fy             =28122.792 tonf/m^2.
           -. cc   =    0.054 m.
           -. s1   = 380*(280/fs) - 2.5Cc =    0.251 m.
           -. s2   = 300*(280/fs)         =    0.305 m.
           -. smax = MIN[ s1, s2 ]        =    0.251 m.
           -. s    =    0.075 m. < smax  --->  O.K.
```

```
-------------------------------------------------------------------------------------------
 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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      ( ). Compute required ratio of reinforcement.
           -. k      = 1.000000
           -. Rhomi1 = MAX[ 0.25*SQRT(fc)/fy, 1.4/fy ]          =   0.0034
           -. Rhomi2 = (4/3)*Mu/[ phi*fy*b*d*(d-a/2) ]          =   0.0004
           -. Rhomin = MIN[ Rhomi1, Rhomi2 ]                    =   0.0004
           -. Rho_et = 0.85*beta1*(fc/fy)*(0.003/(0.003+0.004)) =   0.0206
           -. Rhomax = MIN[ k*Rho_et, 0.025 ]                   =   0.0206

      ( ). Check ratio of tensile reinforcement.
           -. Rho = Ast/(bw*d) =   0.0063
           -. Rhomin < Rho < Rhomax  --->  O.K !

      ( ). Check maximum permissible tensile reinforcement.
           -. cb     = (0.003/(0.003+0.004))*d      =       0.230 m.
           -. c_max  = cb                           =       0.230 m.
           -. a_max  = beta1*c_max                  =       0.195 m.
           -. Cc_max = 0.85*fc*(bw*a_max)           =      233.59 tonf.
           -. esc    = 0.003*(c_max-dc)/c_max       =       0.002
           -. fsc    = Es*esc                       =   42184.188 tonf/m^2.
           -. Cs     = (fsc-0.85*fc)*Asc            =       67.78 tonf.
           -. Ts_max = Cc_max+Cs                    =      301.37 tonf.
           -. Asmax  = Ts_max/fy                    =       0.007 m^2.
           -. Ast    =       0.002 m^2.  <  Asmax  --->  O.K !

      ( ). Check compression steel yield condition.
           -. cy     = (0.003/(0.003-fy/Es))*dc =       0.204 m.
           -. Ccy    = 0.85*fc*bw*(beta1*cy)    =      207.75 tonf.
           -. Csy    = (fy-0.85*fc)*Asc         =       67.78 tonf.
           -. Tsy    = Ccy+Csy                  =      275.53 tonf.
           -. Asy    = Tsy/fy                   =       0.007 m^2.
           -. Ast    =       0.002 m^2.  <  Asy  --->  Compression steel does not yield.

      ( ). Search for neutral axis......     Unit :  tonf.,  m.
           ------------------------------------------------------------------
             Trial        c        Cc +      Cs =      CcCs        Ts    Ratio
           ------------------------------------------------------------------
              1-st    0.268    272.52     67.78      340.30     71.85  -273.64
              2-nd    0.134    136.26     50.80      187.06     71.85   -60.36
              3-rd    0.067     68.13      5.54       73.67     71.85    97.47
              4-th    0.034     34.07    -71.85      -37.78     71.85   -52.59
              5-th    0.050     51.10    -27.36       23.74     71.85    33.05
              6-th    0.059     59.61     -8.56       51.05     71.85    71.06
              7-th    0.063     63.87     -1.04       62.83     71.85    87.45
              8-th    0.065     66.00      2.35       68.35     71.85    95.14
              9-th    0.066     67.07      3.97       71.04     71.85    98.87
             10-th    0.067     67.60      4.76       72.36     71.85    99.29
             11-th    0.066     67.33      4.37       71.70     71.85    99.79
           ------------------------------------------------------------------
```

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 midas Gen - RC-Beam Checking   [ NSR-10 ]                                  Gen 2021
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      ( ). Compute allowable moment capacity.
           -. a      = beta1*c                =      0.056 m.
           -. esc    = 0.003*(c-dc)/c         =   0.000126
           -. fsc    = MIN[ Es*esc, fy ]      =   2563.217 tonf/m^2.
           -. Cs     = fsc*Asc                =        4.37 tonf.
           -. Cc     = 0.85*fc*bw*a           =       67.33 tonf.
           -. Mn     = Cc*(d-a/2)+Cs*(d-dc)   =       36.29 tonf-m.
           -. phi    = 0.90
           -. phiMn  = phi*Mn                 =       32.66 tonf-m.

      ( ). Check ratio of positive moment capacity.
           -. Rat_P  = Mu/phiMn =    0.052  <  1.000  --->  O.K.

 ===========================================================================
    [[[*]]]   ANALYZE NEGATIVE BENDING MOMENT CAPACITY.
 ===========================================================================

      ( ). Compute design parameter.
           -. beta1  = 0.8500  ( fc < 28 MPa.)

      ( ). Check spacing of reinforcement closet to the tensile face.
           -. fs   = (2/3)*fy             =28122.792 tonf/m^2.
           -. cc   =    0.054 m.
           -. s1   = 380*(280/fs) - 2.5Cc =    0.251 m.
           -. s2   = 300*(280/fs)         =    0.305 m.
           -. smax = MIN[ s1, s2 ]        =    0.251 m.
           -. s    =    0.075 m. < smax  --->  O.K.

      ( ). Compute required ratio of reinforcement.
           -. k      = 1.000000
           -. Rhomi1 = MAX[ 0.25*SQRT(fc)/fy, 1.4/fy ]          =   0.0034
           -. Rhomi2 = (4/3)*Mu/[ phi*fy*b*d*(d-a/2) ]          =   0.0034
           -. Rhomin = MIN[ Rhomi1, Rhomi2 ]                    =   0.0034
           -. Rho_et = 0.85*beta1*(fc/fy)*(0.003/(0.003+0.004)) =   0.0206
           -. Rhomax = MIN[ k*Rho_et, 0.025 ]                   =   0.0206

      ( ). Check ratio of tensile reinforcement.
           -. Rho = Ast/(bw*d) =   0.0063
           -. Rhomin < Rho < Rhomax  --->  O.K !

      ( ). Check maximum permissible tensile reinforcement.
           -. cb     = (0.003/(0.003+0.004))*d      =       0.230 m.
           -. c_max  = cb                           =       0.230 m.
           -. a_max  = beta1*c_max                  =       0.195 m.
           -. Cc_max = 0.85*fc*(bw*a_max)           =      233.59 tonf.
           -. esc    = 0.003*(c_max-dc)/c_max       =       0.002
           -. fsc    = Es*esc                       =   42184.188 tonf/m^2.
           -. Cs     = (fsc-0.85*fc)*Asc            =       67.78 tonf.
           -. Ts_max = Cc_max+Cs                    =      301.37 tonf.
           -. Asmax  = Ts_max/fy                    =       0.007 m^2.
           -. Ast    =       0.002 m^2.  <  Asmax  --->  O.K !
```

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 midas Gen - RC-Beam Checking   [ NSR-10 ]                                      Gen 2021
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      ( ). Check compression steel yield condition.
           -. cy     = (0.003/(0.003-fy/Es))*dc =       0.204 m.
           -. Ccy    = 0.85*fc*bw*(beta1*cy)    =      207.75 tonf.
           -. Csy    = (fy-0.85*fc)*Asc         =       67.78 tonf.
           -. Tsy    = Ccy+Csy                  =      275.53 tonf.
           -. Asy    = Tsy/fy                   =       0.007 m^2.
           -. Ast    =       0.002 m^2.  <  Asy  --->  Compression steel does not yield.

      ( ). Search for neutral axis......     Unit :  tonf.,  m.
           ------------------------------------------------------------------------
             Trial        c        Cc +      Cs =      CcCs        Ts    Ratio
           ------------------------------------------------------------------------
              1-st    0.268    272.52     67.78      340.30     71.85  -273.64
              2-nd    0.134    136.26     50.80      187.06     71.85   -60.36
              3-rd    0.067     68.13      5.54       73.67     71.85    97.47
              4-th    0.034     34.07    -71.85      -37.78     71.85   -52.59
              5-th    0.050     51.10    -27.36       23.74     71.85    33.05
              6-th    0.059     59.61     -8.56       51.05     71.85    71.06
              7-th    0.063     63.87     -1.04       62.83     71.85    87.45
              8-th    0.065     66.00      2.35       68.35     71.85    95.14
              9-th    0.066     67.07      3.97       71.04     71.85    98.87
             10-th    0.067     67.60      4.76       72.36     71.85    99.29
             11-th    0.066     67.33      4.37       71.70     71.85    99.79
           ------------------------------------------------------------------------

      ( ). Compute allowable moment capacity.
           -. a      = beta1*c                =      0.056 m.
           -. esc    = 0.003*(c-dc)/c         =   0.000126
           -. fsc    = MIN[ Es*esc, fy ]      =   2563.217 tonf/m^2.
           -. Cs     = fsc*Asc                =        4.37 tonf.
           -. Cc     = 0.85*fc*bw*a           =       67.33 tonf.
           -. Mn     = Cc*(d-a/2)+Cs*(d-dc)   =       36.29 tonf-m.
           -. phi    = 0.90
           -. phiMn  = phi*Mn                 =       32.66 tonf-m.

      ( ). Check ratio of negative moment capacity.
           -. Rat_N  = Mu/phiMn =    0.414  <  1.000  --->  O.K.

 ============================================================================
    [[[*]]]   ANALYZE SHEAR CAPACITY.
 ============================================================================

      ( ). Compute shear strength of concrete.
           -. Vu     =        9.74 tonf.
           -. Vc     = 0.17*SQRT(fc)*bw*d =       24.42 tonf.
           -. phi    = 0.75
           -. phiVc  = phi*Vc             =       18.32 tonf.
           -. phiVc/2 < Vu < phiVc  --->  Minimum shear reinforcement is required.
```

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 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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      ( ). Compute required shear reinforcement. ( Av1 =  0.00007 m^2. )
           -. Avmin1 = 0.35*bw/fys           =4.230e-04 m^2/m.
           -. Avmin2 = 0.062*SQRT(fc)*bw/fys =3.935e-04 m^2/m.
           -. Av     = MAX[ Avmin1, Avmin2 ] =4.230e-04 m^2/m.
           -. N_leg  =  2
           -. Calculate spacing s1 = N_leg*Av1 / Av         =    0.336 m.
           -. Applied spacing s    = MIN[ s1, d/2, 600 mm ] =    0.268 m.

 ============================================================================
    [[[*]]]   CHECK DEFLECTIONS.
 ============================================================================

      ( ). Calculate design moment for Deflection.
           -. Mu_D(+) =       4.824 tonf-m. (Positive moment of Dead Load)
           -. Mu_D(-) =      -9.648 tonf-m. (Negative moment of Dead Load)
           -. Mu_L(+) =       0.000 tonf-m. (Positive moment of Live Load)
           -. Mu_L(-) =       0.000 tonf-m. (Negative moment of Live Load)
           -. Sust (Sustained Factor) =        0.50
           -. Mu_D+L(+) = Mu_D(+) + Mu_L(+)      =       4.824 tonf-m.
           -. Mu_D+L(-) = Mu_D(-) + Mu_L(-)      =      -9.648 tonf-m.
           -. Mu_Sus(+) = Mu_D(+) + Sust*Mu_L(+) =       4.824 tonf-m.
           -. Mu_Sus(-) = Mu_D(-) + Sust*Mu_L(-) =      -9.648 tonf-m.

      ( ). Calculate cracking moment : Mcr(+)
           -. fr = 0.62*sqrt(fck) =     332.017 tonf/m^2.
           -. Ig =       0.009 m^4.
           -. yt = Hc/2 =       0.300 m.
           -. Mcr(+) = fr*Ig/yt =       9.961 tonf-m.

      ( ). Calculate cracking moment : Mcr(-)
           -. fr = 0.62*sqrt(fck) =     332.017 tonf/m^2.
           -. Ig =       0.009 m^4.
           -. yt = Hc/2 =       0.300 m.
           -. Mcr(-) = fr*Ig/yt =       9.961 tonf-m.

      ( ). Calculate cracked section moments of inertia : Icr(+)
           -. n      = Es/Ec =       8.103
           -. Ast    =       0.002 m^2.
           -. Asc    =       0.002 m^2.
           -. B      = Bc/(n*Ast)          =   3.623e-05 m.
           -. r      = (n-1)*Asc / (n*Ast) =       0.877
           -. kd     = [ sqrt(2*dt*B*(1+r*dc/dt)+(1+r)^2) - (1+r) ] / B =       0.136 m.
           -. Icr(+) = Bc*kd^3/3 + n*Ast*(dt-kd)^2 + (n-1)*Asc*(kd-dc)^2 =       0.003 m^4.
```

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 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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      ( ). Calculate cracked section moments of inertia : Icr(-)
           -. n      = Es/Ec =       8.103
           -. Ast    =       0.002 m^2.
           -. Asc    =       0.002 m^2.
           -. B      = Bc/(n*Ast)          =   3.623e-05 m.
           -. r      = (n-1)*Asc / (n*Ast) =       0.877
           -. kd     = [ sqrt(2*dt*B*(1+r*dc/dt)+(1+r)^2) - (1+r) ] / B =       0.136 m.
           -. Icr(-) = Bc*kd^3/3 + n*Ast*(dt-kd)^2 + (n-1)*Asc*(kd-dc)^2 =       0.003 m^4.

      ( ). Calculate effective moment of inertia

           [ Dead Load(+) Case ]
           -. Ma        = Mu_D(+)   =       4.824 tonf-m.
           -. Mcr       = Mcr(+)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(+)    =       0.003 m^4.
           -. Ie_D(+)   = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

           [ Dead Load(-) Case ]
           -. Ma        = Mu_D(-)   =      -9.648 tonf-m.
           -. Mcr       = Mcr(-)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(-)    =       0.003 m^4.
           -. Ie_D(-)   = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

           [ Dead+Live Load(+) Case ]
           -. Ma        = Mu_D+L(+) =       4.824 tonf-m.
           -. Mcr       = Mcr(+)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(+)    =       0.003 m^4.
           -. Ie_D+L(+) = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

           [ Dead+Live Load(-) Case ]
           -. Ma        = Mu_D+L(-) =      -9.648 tonf-m.
           -. Mcr       = Mcr(-)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(-)    =       0.003 m^4.
           -. Ie_D+L(-) = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

           [ Sustained Load(+) Case ]
           -. Ma        = Mu_Sus(+) =       4.824 tonf-m.
           -. Mcr       = Mcr(+)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(+)    =       0.003 m^4.
           -. Ie_Sus(+) = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.
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 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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           [ Sustained Load(-) Case ]
           -. Ma        = Mu_Sus(-) =      -9.648 tonf-m.
           -. Mcr       = Mcr(-)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(-)    =       0.003 m^4.
           -. Ie_Sus(-) = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

      ( ). Calculate initial or short-time deflection

           [ Dead load ]
           -. Ma = Mu_D(+)            =       4.824 tonf-m.
           -. K  (Fix-Fix support)    =   0.60
           -. Ie_avg = 0.7*Ie_D(+) + 0.3*Ie_D(-)   =       0.009 m^4.
           -. Delta_D = K*(5/48) * (Ma*L^2 / (Ec*Ie_avg)) =   9.223e-04 m.

           [ Dead+Live load ]
           -. Ma = Mu_D+L(+)          =       4.824 tonf-m.
           -. K  (Fix-Fix support)    =   0.60
           -. Ie_avg = 0.7*Ie_D+L(+) + 0.3*Ie_D+L(-)   =       0.009 m^4.
           -. Delta_D+L = K*(5/48) * (Ma*L^2 / (Ec*Ie_avg)) =   9.223e-04 m.

           [ Sustained load ]
           -. Ma = Mu_Sus(+)          =       4.824 tonf-m.
           -. K  (Fix-Fix support)    =   0.60
           -. Ie_avg = 0.7*Ie_Sus(+) + 0.3*Ie_Sus(-)   =       0.009 m^4.
           -. Delta_Sus = K*(5/48) * (Ma*L^2 / (Ec*Ie_avg)) =   9.223e-04 m.

      ( ). Check short-time deflection
           -. Delta_L   = Delta_D+L - Delta_D =       0.000 m.
           -. DAF       =     1.000 (Deflection Amplification Factor)
           -. Def_Short = DAF * Delta_L =       0.000 m.
           -. Def_Lim   = L /  360.000 =       0.023 m.
              Def_Short < Def_Lim   --->  O.K !

      ( ). Check long-time deflection
           -. xi       =    2.00 (Time-Dependent Factor)
           -. Lambda   = xi/(1+50*p') =    1.518
           -. DAF      =     1.000 (Deflection Amplification Factor)
           -. Def_Long = DAF * (Lambda*Delta_Sus+Delta_L) =       0.001 m.
           -. Def_Lim  = L /  480.000 =       0.017 m.
              Def_Long < Def_Lim   --->  O.K !
```

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 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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      *.midas Gen - RC-BEAM Analysis/Design Program.

      *.PROJECT       :
      *.DESIGN CODE   : NSR-10,         *.UNIT SYSTEM : tonf, m
        (Note. Nonhomogenous equation in the code are written in SI units in the report)
      *.MEMBER        : Member Type = BEAM,   MEMB =  1102

      *.DESCRIPTION OF BEAM DATA (iSEC =    14) : R-01(50X60)
        Section Type : Rectangle (RECT)
        Beam Length (Span)             =         8.324 m.
        Section Depth (Hc)             =         0.600 m.
        Section Width (Bc)             =         0.500 m.
        Concrete Strength (fc)         =      2812.279 tonf/m^2.
        Modulus of Elasticity (Ec)     =   2516904.499 tonf/m^2.
        Main Rebar Strength (fy)       =     42184.188 tonf/m^2.
        Stirrups Strength (fys)        =     42184.188 tonf/m^2.
        Modulus of Elasticity (Es)     =  20394324.260 tonf/m^2.

      *.DESCRIPTION OF APPLIED FACTORS FOR DESIGN/CHECKING.
        Special Provisions For Seismic Design : Moderate Energy Dissipation (DMO).
         -. Seismic Scale Up Factor for Shear (a1) = 1.000
         -. Seismic Scale Up Factor for Shear (a2) = 2.000
         -. Applied Scale Up Factor for Shear = MIN[Shear by a1, Shear by a2]
        Members for Non-Seismic Design.

      *.FORCES AND MOMENTS AT CHECK POINT <M> :
        Positive Bending Moment   P-Mu =        6.75 tonf-m.,  LCB =   1
        Negative Bending Moment   N-Mu =        0.00 tonf-m.,  LCB =  26
        Shear Force                Vu  =        4.87 tonf.  ,  LCB =   1

      *.REINFORCEMENT PATTERN :
        ---------------------------------------------------------
           Location    i     di( m.)       Rebar    Asi( m^2.)
        ---------------------------------------------------------
           Top         1      0.064         6-#6      0.00170
           Bottom      2      0.536         6-#6      0.00170
        ---------------------------------------------------------
           Stirrups : #3

 ===========================================================================
    [[[*]]]   ANALYZE POSITIVE BENDING MOMENT CAPACITY.
 ===========================================================================

      ( ). Compute design parameter.
           -. beta1  = 0.8500  ( fc < 28 MPa.)

      ( ). Check spacing of reinforcement closet to the tensile face.
           -. fs   = (2/3)*fy             =28122.792 tonf/m^2.
           -. cc   =    0.054 m.
           -. s1   = 380*(280/fs) - 2.5Cc =    0.251 m.
           -. s2   = 300*(280/fs)         =    0.305 m.
           -. smax = MIN[ s1, s2 ]        =    0.251 m.
           -. s    =    0.075 m. < smax  --->  O.K.
```

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--------------------------------------------------------------------------------------------
 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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      ( ). Compute required ratio of reinforcement.
           -. k      = 1.000000
           -. Rhomi1 = MAX[ 0.25*SQRT(fc)/fy, 1.4/fy ]          =   0.0034
           -. Rhomi2 = (4/3)*Mu/[ phi*fy*b*d*(d-a/2) ]          =   0.0017
           -. Rhomin = MIN[ Rhomi1, Rhomi2 ]                    =   0.0017
           -. Rho_et = 0.85*beta1*(fc/fy)*(0.003/(0.003+0.004)) =   0.0206
           -. Rhomax = MIN[ k*Rho_et, 0.025 ]                   =   0.0206

      ( ). Check ratio of tensile reinforcement.
           -. Rho = Ast/(bw*d) =   0.0063
           -. Rhomin < Rho < Rhomax  --->  O.K !

      ( ). Check maximum permissible tensile reinforcement.
           -. cb     = (0.003/(0.003+0.004))*d      =       0.230 m.
           -. c_max  = cb                           =       0.230 m.
           -. a_max  = beta1*c_max                  =       0.195 m.
           -. Cc_max = 0.85*fc*(bw*a_max)           =      233.59 tonf.
           -. esc    = 0.003*(c_max-dc)/c_max       =       0.002
           -. fsc    = Es*esc                       =   42184.188 tonf/m^2.
           -. Cs     = (fsc-0.85*fc)*Asc            =       67.78 tonf.
           -. Ts_max = Cc_max+Cs                    =      301.37 tonf.
           -. Asmax  = Ts_max/fy                    =       0.007 m^2.
           -. Ast    =       0.002 m^2.  <  Asmax  --->  O.K !

      ( ). Check compression steel yield condition.
           -. cy     = (0.003/(0.003-fy/Es))*dc =       0.204 m.
           -. Ccy    = 0.85*fc*bw*(beta1*cy)    =      207.75 tonf.
           -. Csy    = (fy-0.85*fc)*Asc         =       67.78 tonf.
           -. Tsy    = Ccy+Csy                  =      275.53 tonf.
           -. Asy    = Tsy/fy                   =       0.007 m^2.
           -. Ast    =       0.002 m^2.  <  Asy  --->  Compression steel does not yield.

      ( ). Search for neutral axis......     Unit :  tonf.,  m.
           ------------------------------------------------------------------
             Trial        c        Cc +      Cs =      CcCs        Ts    Ratio
           ------------------------------------------------------------------
              1-st    0.268    272.52     67.78      340.30     71.85  -273.64
              2-nd    0.134    136.26     50.80      187.06     71.85   -60.36
              3-rd    0.067     68.13      5.54       73.67     71.85    97.47
              4-th    0.034     34.07    -71.85      -37.78     71.85   -52.59
              5-th    0.050     51.10    -27.36       23.74     71.85    33.05
              6-th    0.059     59.61     -8.56       51.05     71.85    71.06
              7-th    0.063     63.87     -1.04       62.83     71.85    87.45
              8-th    0.065     66.00      2.35       68.35     71.85    95.14
              9-th    0.066     67.07      3.97       71.04     71.85    98.87
             10-th    0.067     67.60      4.76       72.36     71.85    99.29
             11-th    0.066     67.33      4.37       71.70     71.85    99.79
           ------------------------------------------------------------------
```

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```
-------------------------------------------------------------------------------------------
 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
===========================================================================================


      ( ). Compute allowable moment capacity.
           -. a      = beta1*c                =      0.056 m.
           -. esc    = 0.003*(c-dc)/c         =   0.000126
           -. fsc    = MIN[ Es*esc, fy ]      =   2563.217 tonf/m^2.
           -. Cs     = fsc*Asc                =       4.37 tonf.
           -. Cc     = 0.85*fc*bw*a           =      67.33 tonf.
           -. Mn     = Cc*(d-a/2)+Cs*(d-dc)   =      36.29 tonf-m.
           -. phi    = 0.90
           -. phiMn  = phi*Mn                 =      32.66 tonf-m.

      ( ). Check ratio of positive moment capacity.
           -. Rat_P  = Mu/phiMn =    0.207  <  1.000  --->  O.K.

 ===========================================================================
    [[[*]]]   ANALYZE NEGATIVE BENDING MOMENT CAPACITY.
 ===========================================================================

      ( ). Compute design parameter.
           -. beta1  = 0.8500  ( fc < 28 MPa.)

      ( ). Compute required ratio of reinforcement.
           -. k      = 1.000000
           -. Rhomin =   0.0000
           -. Rho_et = 0.85*beta1*(fc/fy)*(0.003/(0.003+0.004)) =   0.0206
           -. Rhomax = MIN[ k*Rho_et, 0.025 ]                   =   0.0206

      ( ). Check ratio of tensile reinforcement.
           -. Rho = Ast/(bw*d) =   0.0063
           -. Rhomin < Rho < Rhomax  --->  O.K !

      ( ). Check maximum permissible tensile reinforcement.
           -. cb     = (0.003/(0.003+0.004))*d      =      0.230 m.
           -. c_max  = cb                           =      0.230 m.
           -. a_max  = beta1*c_max                  =      0.195 m.
           -. Cc_max = 0.85*fc*(bw*a_max)           =     233.59 tonf.
           -. esc    = 0.003*(c_max-dc)/c_max       =      0.002
           -. fsc    = Es*esc                       =  42184.188 tonf/m^2.
           -. Cs     = (fsc-0.85*fc)*Asc            =      67.78 tonf.
           -. Ts_max = Cc_max+Cs                    =     301.37 tonf.
           -. Asmax  = Ts_max/fy                    =      0.007 m^2.
           -. Ast    =       0.002 m^2.  <  Asmax  --->  O.K !

      ( ). Check compression steel yield condition.
           -. cy     = (0.003/(0.003-fy/Es))*dc =      0.204 m.
           -. Ccy    = 0.85*fc*bw*(beta1*cy)    =     207.75 tonf.
           -. Csy    = (fy-0.85*fc)*Asc         =      67.78 tonf.
           -. Tsy    = Ccy+Csy                  =     275.53 tonf.
           -. Asy    = Tsy/fy                   =      0.007 m^2.
           -. Ast    =       0.002 m^2.  <  Asy  --->  Compression steel does not yield.
```

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```
--------------------------------------------------------------------------------------------
 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
============================================================================================


     ( ). Search for neutral axis......     Unit :  tonf.,  m.
          ------------------------------------------------------------------------
            Trial        c        Cc +      Cs =      CcCs        Ts    Ratio
          ------------------------------------------------------------------------
             1-st    0.268    272.52     67.78      340.30     71.85  -273.64
             2-nd    0.134    136.26     50.80      187.06     71.85   -60.36
             3-rd    0.067     68.13      5.54       73.67     71.85    97.47
             4-th    0.034     34.07    -71.85      -37.78     71.85   -52.59
             5-th    0.050     51.10    -27.36       23.74     71.85    33.05
             6-th    0.059     59.61     -8.56       51.05     71.85    71.06
             7-th    0.063     63.87     -1.04       62.83     71.85    87.45
             8-th    0.065     66.00      2.35       68.35     71.85    95.14
             9-th    0.066     67.07      3.97       71.04     71.85    98.87
            10-th    0.067     67.60      4.76       72.36     71.85    99.29
            11-th    0.066     67.33      4.37       71.70     71.85    99.79
          ------------------------------------------------------------------------

     ( ). Compute allowable moment capacity.
          -. a      = beta1*c                =      0.056 m.
          -. esc    = 0.003*(c-dc)/c         =   0.000126
          -. fsc    = MIN[ Es*esc, fy ]      =   2563.217 tonf/m^2.
          -. Cs     = fsc*Asc                =       4.37 tonf.
          -. Cc     = 0.85*fc*bw*a           =      67.33 tonf.
          -. Mn     = Cc*(d-a/2)+Cs*(d-dc)   =      36.29 tonf-m.
          -. phi    = 0.90
          -. phiMn  = phi*Mn                 =      32.66 tonf-m.

     ( ). Check ratio of negative moment capacity.
          -. Rat_N  = Mu/phiMn =    0.000  <  1.000  --->  O.K.

============================================================================================
   [[[*]]]   ANALYZE SHEAR CAPACITY.
============================================================================================

     ( ). Compute shear strength of concrete.
          -. Vu     =        4.87 tonf.
          -. Vc     = 0.17*SQRT(fc)*bw*d =       24.42 tonf.
          -. phi    = 0.75
          -. phiVc  = phi*Vc             =       18.32 tonf.
          -. Vu < phiVc/2  --->  Shear reinforcement is not required.

     ( ). Compute required shear reinforcement.
          -. Applied spacing s    = MIN[ d/2, 600 mm ] =    0.268 m.

============================================================================================
   [[[*]]]   CHECK DEFLECTIONS.
============================================================================================
```

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 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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      ( ). Calculate design moment for Deflection.
           -. Mu_D(+) =       4.824 tonf-m. (Positive moment of Dead Load)
           -. Mu_D(-) =      -9.648 tonf-m. (Negative moment of Dead Load)
           -. Mu_L(+) =       0.000 tonf-m. (Positive moment of Live Load)
           -. Mu_L(-) =       0.000 tonf-m. (Negative moment of Live Load)
           -. Sust (Sustained Factor) =        0.50
           -. Mu_D+L(+) = Mu_D(+) + Mu_L(+)      =       4.824 tonf-m.
           -. Mu_D+L(-) = Mu_D(-) + Mu_L(-)      =      -9.648 tonf-m.
           -. Mu_Sus(+) = Mu_D(+) + Sust*Mu_L(+) =       4.824 tonf-m.
           -. Mu_Sus(-) = Mu_D(-) + Sust*Mu_L(-) =      -9.648 tonf-m.

      ( ). Calculate cracking moment : Mcr(+)
           -. fr = 0.62*sqrt(fck) =     332.017 tonf/m^2.
           -. Ig =       0.009 m^4.
           -. yt = Hc/2 =       0.300 m.
           -. Mcr(+) = fr*Ig/yt =       9.961 tonf-m.

      ( ). Calculate cracking moment : Mcr(-)
           -. fr = 0.62*sqrt(fck) =     332.017 tonf/m^2.
           -. Ig =       0.009 m^4.
           -. yt = Hc/2 =       0.300 m.
           -. Mcr(-) = fr*Ig/yt =       9.961 tonf-m.

      ( ). Calculate cracked section moments of inertia : Icr(+)
           -. n      = Es/Ec =       8.103
           -. Ast    =       0.002 m^2.
           -. Asc    =       0.002 m^2.
           -. B      = Bc/(n*Ast)          =   3.623e-05 m.
           -. r      = (n-1)*Asc / (n*Ast) =       0.877
           -. kd     = [ sqrt(2*dt*B*(1+r*dc/dt)+(1+r)^2) - (1+r) ] / B =       0.136 m.
           -. Icr(+) = Bc*kd^3/3 + n*Ast*(dt-kd)^2 + (n-1)*Asc*(kd-dc)^2 =       0.003 m^4.

      ( ). Calculate cracked section moments of inertia : Icr(-)
           -. n      = Es/Ec =       8.103
           -. Ast    =       0.002 m^2.
           -. Asc    =       0.002 m^2.
           -. B      = Bc/(n*Ast)          =   3.623e-05 m.
           -. r      = (n-1)*Asc / (n*Ast) =       0.877
           -. kd     = [ sqrt(2*dt*B*(1+r*dc/dt)+(1+r)^2) - (1+r) ] / B =       0.136 m.
           -. Icr(-) = Bc*kd^3/3 + n*Ast*(dt-kd)^2 + (n-1)*Asc*(kd-dc)^2 =       0.003 m^4.

      ( ). Calculate effective moment of inertia

           [ Dead Load(+) Case ]
           -. Ma        = Mu_D(+)   =       4.824 tonf-m.
           -. Mcr       = Mcr(+)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(+)    =       0.003 m^4.
           -. Ie_D(+)   = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.
```

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--------------------------------------------------------------------------------------------
 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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          [ Dead Load(-) Case ]
          -. Ma        = Mu_D(-)    =      -9.648 tonf-m.
          -. Mcr       = Mcr(-)     =       9.961 tonf-m.
          -. Ig        =       0.009 m^4.
          -. Icr       = Icr(-)     =       0.003 m^4.
          -. Ie_D(-)   = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

          [ Dead+Live Load(+) Case ]
          -. Ma        = Mu_D+L(+) =       4.824 tonf-m.
          -. Mcr       = Mcr(+)    =       9.961 tonf-m.
          -. Ig        =       0.009 m^4.
          -. Icr       = Icr(+)    =       0.003 m^4.
          -. Ie_D+L(+) = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

          [ Dead+Live Load(-) Case ]
          -. Ma        = Mu_D+L(-) =      -9.648 tonf-m.
          -. Mcr       = Mcr(-)    =       9.961 tonf-m.
          -. Ig        =       0.009 m^4.
          -. Icr       = Icr(-)    =       0.003 m^4.
          -. Ie_D+L(-) = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

          [ Sustained Load(+) Case ]
          -. Ma        = Mu_Sus(+) =       4.824 tonf-m.
          -. Mcr       = Mcr(+)    =       9.961 tonf-m.
          -. Ig        =       0.009 m^4.
          -. Icr       = Icr(+)    =       0.003 m^4.
          -. Ie_Sus(+) = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

          [ Sustained Load(-) Case ]
          -. Ma        = Mu_Sus(-) =      -9.648 tonf-m.
          -. Mcr       = Mcr(-)    =       9.961 tonf-m.
          -. Ig        =       0.009 m^4.
          -. Icr       = Icr(-)    =       0.003 m^4.
          -. Ie_Sus(-) = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

     ( ). Calculate initial or short-time deflection

          [ Dead load ]
          -. Ma = Mu_D(+)            =       4.824 tonf-m.
          -. K  (Fix-Fix support)    =   0.60
          -. Ie_avg = 0.7*Ie_D(+) + 0.3*Ie_D(-)   =       0.009 m^4.
          -. Delta_D = K*(5/48) * (Ma*L^2 / (Ec*Ie_avg)) =   9.223e-04 m.

          [ Dead+Live load ]
          -. Ma = Mu_D+L(+)          =       4.824 tonf-m.
          -. K  (Fix-Fix support)    =   0.60
          -. Ie_avg = 0.7*Ie_D+L(+) + 0.3*Ie_D+L(-)   =       0.009 m^4.
          -. Delta_D+L = K*(5/48) * (Ma*L^2 / (Ec*Ie_avg)) =   9.223e-04 m.
```

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```
 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
```

[Sustained load]
-. Ma = Mu_Sus(+) = 4.824 tonf-m.
-. K (Fix-Fix support) = 0.60
-. Ie_avg = 0.7*Ie_Sus(+) + 0.3*Ie_Sus(-) = 0.009 m^4.
-. Delta_Sus = K*(5/48) * (Ma*L^2 / (Ec*Ie_avg)) = 9.223e-04 m.

( ). Check short-time deflection
-. Delta_L = Delta_D+L - Delta_D = 0.000 m.
-. DAF = 1.000 (Deflection Amplification Factor)
-. Def_Short = DAF * Delta_L = 0.000 m.
-. Def_Lim = L / 360.000 = 0.023 m.
Def_Short < Def_Lim ---> O.K !

( ). Check long-time deflection
-. xi = 2.00 (Time-Dependent Factor)
-. Lambda = xi/(1+50*p') = 1.518
-. DAF = 1.000 (Deflection Amplification Factor)
-. Def_Long = DAF * (Lambda*Delta_Sus+Delta_L) = 0.001 m.
-. Def_Lim = L / 480.000 = 0.017 m.
Def_Long < Def_Lim ---> O.K !

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--------------------------------------------------------------------------------------------
 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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      *.midas Gen - RC-BEAM Analysis/Design Program.

      *.PROJECT       :
      *.DESIGN CODE   : NSR-10,         *.UNIT SYSTEM : tonf, m
        (Note. Nonhomogenous equation in the code are written in SI units in the report)
      *.MEMBER        : Member Type = BEAM,   MEMB =  1102

      *.DESCRIPTION OF BEAM DATA (iSEC =    14) : R-01(50X60)
        Section Type : Rectangle (RECT)
        Beam Length (Span)             =         8.324 m.
        Section Depth (Hc)             =         0.600 m.
        Section Width (Bc)             =         0.500 m.
        Concrete Strength (fc)         =      2812.279 tonf/m^2.
        Modulus of Elasticity (Ec)     =   2516904.499 tonf/m^2.
        Main Rebar Strength (fy)       =     42184.188 tonf/m^2.
        Stirrups Strength (fys)        =     42184.188 tonf/m^2.
        Modulus of Elasticity (Es)     =  20394324.260 tonf/m^2.

      *.DESCRIPTION OF APPLIED FACTORS FOR DESIGN/CHECKING.
        Special Provisions For Seismic Design : Moderate Energy Dissipation (DMO).
         -. Seismic Scale Up Factor for Shear (a1) = 1.000
         -. Seismic Scale Up Factor for Shear (a2) = 2.000
         -. Applied Scale Up Factor for Shear = MIN[Shear by a1, Shear by a2]
        Members for Non-Seismic Design.

      *.FORCES AND MOMENTS AT CHECK POINT <J> :
        Positive Bending Moment   P-Mu =        1.69 tonf-m.,  LCB =   1
        Negative Bending Moment   N-Mu =       13.51 tonf-m.,  LCB =   1
        Shear Force                Vu  =        9.74 tonf.  ,  LCB =   1

      *.REINFORCEMENT PATTERN :
        ---------------------------------------------------------
           Location    i     di( m.)       Rebar    Asi( m^2.)
        ---------------------------------------------------------
           Top         1      0.064         6-#6      0.00170
           Bottom      2      0.536         6-#6      0.00170
        ---------------------------------------------------------
           Stirrups : #3

 ============================================================================
    [[[*]]]   ANALYZE POSITIVE BENDING MOMENT CAPACITY.
 ============================================================================

      ( ). Compute design parameter.
           -. beta1  = 0.8500  ( fc < 28 MPa.)

      ( ). Check spacing of reinforcement closet to the tensile face.
           -. fs   = (2/3)*fy             =28122.792 tonf/m^2.
           -. cc   =    0.054 m.
           -. s1   = 380*(280/fs) - 2.5Cc =    0.251 m.
           -. s2   = 300*(280/fs)         =    0.305 m.
           -. smax = MIN[ s1, s2 ]        =    0.251 m.
           -. s    =    0.075 m. < smax  --->  O.K.
```

```
-------------------------------------------------------------------------------------------
 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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      ( ). Compute required ratio of reinforcement.
           -. k      = 1.000000
           -. Rhomi1 = MAX[ 0.25*SQRT(fc)/fy, 1.4/fy ]          =   0.0034
           -. Rhomi2 = (4/3)*Mu/[ phi*fy*b*d*(d-a/2) ]          =   0.0004
           -. Rhomin = MIN[ Rhomi1, Rhomi2 ]                    =   0.0004
           -. Rho_et = 0.85*beta1*(fc/fy)*(0.003/(0.003+0.004)) =   0.0206
           -. Rhomax = MIN[ k*Rho_et, 0.025 ]                   =   0.0206

      ( ). Check ratio of tensile reinforcement.
           -. Rho = Ast/(bw*d) =   0.0063
           -. Rhomin < Rho < Rhomax  --->  O.K !

      ( ). Check maximum permissible tensile reinforcement.
           -. cb     = (0.003/(0.003+0.004))*d      =       0.230 m.
           -. c_max  = cb                           =       0.230 m.
           -. a_max  = beta1*c_max                  =       0.195 m.
           -. Cc_max = 0.85*fc*(bw*a_max)           =      233.59 tonf.
           -. esc    = 0.003*(c_max-dc)/c_max       =       0.002
           -. fsc    = Es*esc                       =   42184.188 tonf/m^2.
           -. Cs     = (fsc-0.85*fc)*Asc            =       67.78 tonf.
           -. Ts_max = Cc_max+Cs                    =      301.37 tonf.
           -. Asmax  = Ts_max/fy                    =       0.007 m^2.
           -. Ast    =       0.002 m^2.  <  Asmax  --->  O.K !

      ( ). Check compression steel yield condition.
           -. cy     = (0.003/(0.003-fy/Es))*dc =       0.204 m.
           -. Ccy    = 0.85*fc*bw*(beta1*cy)    =      207.75 tonf.
           -. Csy    = (fy-0.85*fc)*Asc         =       67.78 tonf.
           -. Tsy    = Ccy+Csy                  =      275.53 tonf.
           -. Asy    = Tsy/fy                   =       0.007 m^2.
           -. Ast    =       0.002 m^2.  <  Asy  --->  Compression steel does not yield.

      ( ). Search for neutral axis......     Unit :  tonf.,  m.
           ------------------------------------------------------------------
             Trial        c        Cc +      Cs =      CcCs        Ts    Ratio
           ------------------------------------------------------------------
              1-st    0.268    272.52     67.78      340.30     71.85  -273.64
              2-nd    0.134    136.26     50.80      187.06     71.85   -60.36
              3-rd    0.067     68.13      5.54       73.67     71.85    97.47
              4-th    0.034     34.07    -71.85      -37.78     71.85   -52.59
              5-th    0.050     51.10    -27.36       23.74     71.85    33.05
              6-th    0.059     59.61     -8.56       51.05     71.85    71.06
              7-th    0.063     63.87     -1.04       62.83     71.85    87.45
              8-th    0.065     66.00      2.35       68.35     71.85    95.14
              9-th    0.066     67.07      3.97       71.04     71.85    98.87
             10-th    0.067     67.60      4.76       72.36     71.85    99.29
             11-th    0.066     67.33      4.37       71.70     71.85    99.79
           ------------------------------------------------------------------
```

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-------------------------------------------------------------------------------------------
 midas Gen - RC-Beam Checking   [ NSR-10 ]                                  Gen 2021
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      ( ). Compute allowable moment capacity.
           -. a      = beta1*c                =      0.056 m.
           -. esc    = 0.003*(c-dc)/c         =   0.000126
           -. fsc    = MIN[ Es*esc, fy ]      =   2563.217 tonf/m^2.
           -. Cs     = fsc*Asc                =        4.37 tonf.
           -. Cc     = 0.85*fc*bw*a           =       67.33 tonf.
           -. Mn     = Cc*(d-a/2)+Cs*(d-dc)   =       36.29 tonf-m.
           -. phi    = 0.90
           -. phiMn  = phi*Mn                 =       32.66 tonf-m.

      ( ). Check ratio of positive moment capacity.
           -. Rat_P  = Mu/phiMn =    0.052  <  1.000  --->  O.K.

 ===========================================================================
    [[[*]]]   ANALYZE NEGATIVE BENDING MOMENT CAPACITY.
 ===========================================================================

      ( ). Compute design parameter.
           -. beta1  = 0.8500  ( fc < 28 MPa.)

      ( ). Check spacing of reinforcement closet to the tensile face.
           -. fs   = (2/3)*fy             =28122.792 tonf/m^2.
           -. cc   =    0.054 m.
           -. s1   = 380*(280/fs) - 2.5Cc =    0.251 m.
           -. s2   = 300*(280/fs)         =    0.305 m.
           -. smax = MIN[ s1, s2 ]        =    0.251 m.
           -. s    =    0.075 m. < smax  --->  O.K.

      ( ). Compute required ratio of reinforcement.
           -. k      = 1.000000
           -. Rhomi1 = MAX[ 0.25*SQRT(fc)/fy, 1.4/fy ]          =   0.0034
           -. Rhomi2 = (4/3)*Mu/[ phi*fy*b*d*(d-a/2) ]          =   0.0034
           -. Rhomin = MIN[ Rhomi1, Rhomi2 ]                    =   0.0034
           -. Rho_et = 0.85*beta1*(fc/fy)*(0.003/(0.003+0.004)) =   0.0206
           -. Rhomax = MIN[ k*Rho_et, 0.025 ]                   =   0.0206

      ( ). Check ratio of tensile reinforcement.
           -. Rho = Ast/(bw*d) =   0.0063
           -. Rhomin < Rho < Rhomax  --->  O.K !

      ( ). Check maximum permissible tensile reinforcement.
           -. cb     = (0.003/(0.003+0.004))*d      =       0.230 m.
           -. c_max  = cb                           =       0.230 m.
           -. a_max  = beta1*c_max                  =       0.195 m.
           -. Cc_max = 0.85*fc*(bw*a_max)           =      233.59 tonf.
           -. esc    = 0.003*(c_max-dc)/c_max       =       0.002
           -. fsc    = Es*esc                       =   42184.188 tonf/m^2.
           -. Cs     = (fsc-0.85*fc)*Asc            =       67.78 tonf.
           -. Ts_max = Cc_max+Cs                    =      301.37 tonf.
           -. Asmax  = Ts_max/fy                    =       0.007 m^2.
           -. Ast    =       0.002 m^2.  <  Asmax  --->  O.K !
```

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---------------------------------------------------------------------------------------------
 midas Gen - RC-Beam Checking   [ NSR-10 ]                                      Gen 2021
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      ( ). Check compression steel yield condition.
           -. cy     = (0.003/(0.003-fy/Es))*dc =       0.204 m.
           -. Ccy    = 0.85*fc*bw*(beta1*cy)    =      207.75 tonf.
           -. Csy    = (fy-0.85*fc)*Asc         =       67.78 tonf.
           -. Tsy    = Ccy+Csy                  =      275.53 tonf.
           -. Asy    = Tsy/fy                   =       0.007 m^2.
           -. Ast    =       0.002 m^2.  <  Asy  --->  Compression steel does not yield.

      ( ). Search for neutral axis......     Unit :  tonf.,  m.
           ------------------------------------------------------------------------
             Trial        c        Cc +      Cs =      CcCs        Ts    Ratio
           ------------------------------------------------------------------------
              1-st    0.268    272.52     67.78      340.30     71.85  -273.64
              2-nd    0.134    136.26     50.80      187.06     71.85   -60.36
              3-rd    0.067     68.13      5.54       73.67     71.85    97.47
              4-th    0.034     34.07    -71.85      -37.78     71.85   -52.59
              5-th    0.050     51.10    -27.36       23.74     71.85    33.05
              6-th    0.059     59.61     -8.56       51.05     71.85    71.06
              7-th    0.063     63.87     -1.04       62.83     71.85    87.45
              8-th    0.065     66.00      2.35       68.35     71.85    95.14
              9-th    0.066     67.07      3.97       71.04     71.85    98.87
             10-th    0.067     67.60      4.76       72.36     71.85    99.29
             11-th    0.066     67.33      4.37       71.70     71.85    99.79
           ------------------------------------------------------------------------

      ( ). Compute allowable moment capacity.
           -. a      = beta1*c                =      0.056 m.
           -. esc    = 0.003*(c-dc)/c         =   0.000126
           -. fsc    = MIN[ Es*esc, fy ]      =   2563.217 tonf/m^2.
           -. Cs     = fsc*Asc                =        4.37 tonf.
           -. Cc     = 0.85*fc*bw*a           =       67.33 tonf.
           -. Mn     = Cc*(d-a/2)+Cs*(d-dc)   =       36.29 tonf-m.
           -. phi    = 0.90
           -. phiMn  = phi*Mn                 =       32.66 tonf-m.

      ( ). Check ratio of negative moment capacity.
           -. Rat_N  = Mu/phiMn =    0.414  <  1.000  --->  O.K.

 ============================================================================
    [[[*]]]   ANALYZE SHEAR CAPACITY.
 ============================================================================

      ( ). Compute shear strength of concrete.
           -. Vu     =        9.74 tonf.
           -. Vc     = 0.17*SQRT(fc)*bw*d =       24.42 tonf.
           -. phi    = 0.75
           -. phiVc  = phi*Vc             =       18.32 tonf.
           -. phiVc/2 < Vu < phiVc  --->  Minimum shear reinforcement is required.
```

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--------------------------------------------------------------------------------------------
 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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      ( ). Compute required shear reinforcement. ( Av1 =  0.00007 m^2. )
           -. Avmin1 = 0.35*bw/fys           =4.230e-04 m^2/m.
           -. Avmin2 = 0.062*SQRT(fc)*bw/fys =3.935e-04 m^2/m.
           -. Av     = MAX[ Avmin1, Avmin2 ] =4.230e-04 m^2/m.
           -. N_leg  =  2
           -. Calculate spacing s1 = N_leg*Av1 / Av         =    0.336 m.
           -. Applied spacing s    = MIN[ s1, d/2, 600 mm ] =    0.268 m.

 ============================================================================
    [[[*]]]   CHECK DEFLECTIONS.
 ============================================================================

      ( ). Calculate design moment for Deflection.
           -. Mu_D(+) =       4.824 tonf-m. (Positive moment of Dead Load)
           -. Mu_D(-) =      -9.648 tonf-m. (Negative moment of Dead Load)
           -. Mu_L(+) =       0.000 tonf-m. (Positive moment of Live Load)
           -. Mu_L(-) =       0.000 tonf-m. (Negative moment of Live Load)
           -. Sust (Sustained Factor) =        0.50
           -. Mu_D+L(+) = Mu_D(+) + Mu_L(+)      =       4.824 tonf-m.
           -. Mu_D+L(-) = Mu_D(-) + Mu_L(-)      =      -9.648 tonf-m.
           -. Mu_Sus(+) = Mu_D(+) + Sust*Mu_L(+) =       4.824 tonf-m.
           -. Mu_Sus(-) = Mu_D(-) + Sust*Mu_L(-) =      -9.648 tonf-m.

      ( ). Calculate cracking moment : Mcr(+)
           -. fr = 0.62*sqrt(fck) =     332.017 tonf/m^2.
           -. Ig =       0.009 m^4.
           -. yt = Hc/2 =       0.300 m.
           -. Mcr(+) = fr*Ig/yt =       9.961 tonf-m.

      ( ). Calculate cracking moment : Mcr(-)
           -. fr = 0.62*sqrt(fck) =     332.017 tonf/m^2.
           -. Ig =       0.009 m^4.
           -. yt = Hc/2 =       0.300 m.
           -. Mcr(-) = fr*Ig/yt =       9.961 tonf-m.

      ( ). Calculate cracked section moments of inertia : Icr(+)
           -. n      = Es/Ec =       8.103
           -. Ast    =       0.002 m^2.
           -. Asc    =       0.002 m^2.
           -. B      = Bc/(n*Ast)          =   3.623e-05 m.
           -. r      = (n-1)*Asc / (n*Ast) =       0.877
           -. kd     = [ sqrt(2*dt*B*(1+r*dc/dt)+(1+r)^2) - (1+r) ] / B =       0.136 m.
           -. Icr(+) = Bc*kd^3/3 + n*Ast*(dt-kd)^2 + (n-1)*Asc*(kd-dc)^2 =       0.003 m^4.
```

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 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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      ( ). Calculate cracked section moments of inertia : Icr(-)
           -. n      = Es/Ec =       8.103
           -. Ast    =       0.002 m^2.
           -. Asc    =       0.002 m^2.
           -. B      = Bc/(n*Ast)          =   3.623e-05 m.
           -. r      = (n-1)*Asc / (n*Ast) =       0.877
           -. kd     = [ sqrt(2*dt*B*(1+r*dc/dt)+(1+r)^2) - (1+r) ] / B =       0.136 m.
           -. Icr(-) = Bc*kd^3/3 + n*Ast*(dt-kd)^2 + (n-1)*Asc*(kd-dc)^2 =       0.003 m^4.

      ( ). Calculate effective moment of inertia

           [ Dead Load(+) Case ]
           -. Ma        = Mu_D(+)   =       4.824 tonf-m.
           -. Mcr       = Mcr(+)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(+)    =       0.003 m^4.
           -. Ie_D(+)   = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

           [ Dead Load(-) Case ]
           -. Ma        = Mu_D(-)   =      -9.648 tonf-m.
           -. Mcr       = Mcr(-)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(-)    =       0.003 m^4.
           -. Ie_D(-)   = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

           [ Dead+Live Load(+) Case ]
           -. Ma        = Mu_D+L(+) =       4.824 tonf-m.
           -. Mcr       = Mcr(+)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(+)    =       0.003 m^4.
           -. Ie_D+L(+) = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

           [ Dead+Live Load(-) Case ]
           -. Ma        = Mu_D+L(-) =      -9.648 tonf-m.
           -. Mcr       = Mcr(-)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(-)    =       0.003 m^4.
           -. Ie_D+L(-) = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

           [ Sustained Load(+) Case ]
           -. Ma        = Mu_Sus(+) =       4.824 tonf-m.
           -. Mcr       = Mcr(+)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(+)    =       0.003 m^4.
           -. Ie_Sus(+) = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.
```

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 midas Gen - RC-Beam Checking   [ NSR-10 ]                                    Gen 2021
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           [ Sustained Load(-) Case ]
           -. Ma        = Mu_Sus(-) =      -9.648 tonf-m.
           -. Mcr       = Mcr(-)    =       9.961 tonf-m.
           -. Ig        =       0.009 m^4.
           -. Icr       = Icr(-)    =       0.003 m^4.
           -. Ie_Sus(-) = MIN[ Ig, (Mcr/Ma)^3 *Ig + [1-(Mcr/Ma)^3]*Icr ] =       0.009 m^4.

      ( ). Calculate initial or short-time deflection

           [ Dead load ]
           -. Ma = Mu_D(+)            =       4.824 tonf-m.
           -. K  (Fix-Fix support)    =   0.60
           -. Ie_avg = 0.7*Ie_D(+) + 0.3*Ie_D(-)   =       0.009 m^4.
           -. Delta_D = K*(5/48) * (Ma*L^2 / (Ec*Ie_avg)) =   9.223e-04 m.

           [ Dead+Live load ]
           -. Ma = Mu_D+L(+)          =       4.824 tonf-m.
           -. K  (Fix-Fix support)    =   0.60
           -. Ie_avg = 0.7*Ie_D+L(+) + 0.3*Ie_D+L(-)   =       0.009 m^4.
           -. Delta_D+L = K*(5/48) * (Ma*L^2 / (Ec*Ie_avg)) =   9.223e-04 m.

           [ Sustained load ]
           -. Ma = Mu_Sus(+)          =       4.824 tonf-m.
           -. K  (Fix-Fix support)    =   0.60
           -. Ie_avg = 0.7*Ie_Sus(+) + 0.3*Ie_Sus(-)   =       0.009 m^4.
           -. Delta_Sus = K*(5/48) * (Ma*L^2 / (Ec*Ie_avg)) =   9.223e-04 m.

      ( ). Check short-time deflection
           -. Delta_L   = Delta_D+L - Delta_D =       0.000 m.
           -. DAF       =     1.000 (Deflection Amplification Factor)
           -. Def_Short = DAF * Delta_L =       0.000 m.
           -. Def_Lim   = L /  360.000 =       0.023 m.
              Def_Short < Def_Lim   --->  O.K !

      ( ). Check long-time deflection
           -. xi       =    2.00 (Time-Dependent Factor)
           -. Lambda   = xi/(1+50*p') =    1.518
           -. DAF      =     1.000 (Deflection Amplification Factor)
           -. Def_Long = DAF * (Lambda*Delta_Sus+Delta_L) =       0.001 m.
           -. Def_Lim  = L /  480.000 =       0.017 m.
              Def_Long < Def_Lim   --->  O.K !
```