ELABORACIÓN DE DIAGNÓSTICOS, ESTUDIOS TÉCNICOS, AJUSTES A DISEÑOS O DISEÑOS INTEGRALES, CONSTRUCCIÓN Y PUESTA EN FUNCIONAMIENTO DE LAS OBRAS DE INFRAESTRUCTURA EDUCATIVA – UBICADAS EN EL DEPARTAMENTO DE VALLE DEL CAUCA – GRUPO 02

Contrato No. PAF-JU02-G02DC-2015

INFORME CÁLCULO Y ANÁLISIS ESTRUCTURAL INSTITUCIÓN EDUCATIVA DEL VALLE – SEDE SIXTO MARÍA ROJAS.

BOGOTÁ
2017

CONTROL DE REVISIONES

REVISIÓN	FECHA	OBSERVACIONES
1	30/12/16	Primera Redacción

Elaborado por: Edgar Rolando Barrera Firma:	**Revisado por**: Javier José Carrillo Ortega Fecha: febrero 2017 Firma:	**Aprobado por:** Director de Interventoría Fecha: Firma:

TABLA DE CONTENIDO

LISTA DE FOTOGRAFÍAS

1 INTRODUCCIÓN

El presente documento contiene las memorias de análisis y diseño estructural correspondiente al proyecto de la "INSTITUCIÓN EDUCATIVA DEL VALLE – SEDE SIXTO MARÍA ROJAS" ubicado en el municipio de JAMUNDÍ en el departamento de VALLE DEL CAUCA de acuerdo al contrato No. PAF-JU02-G02DC-2015 realizando el estudio de acuerdo a la Norma Colombiana de Diseño y Construcción Sismo Resistente Ley 400 de 1997 (Modificada Ley 1229 de 2008) y Decreto 926 de Marzo de 2010, Decreto 092 del 17 de Enero de 2011, Decreto 0340 del 13 de Febrero de 2012 y en el Reglamento para Concreto Estructural ACI 318S-08.

Para la evaluación de la edificación se ha seguido un proceso normativo que incluye las etapas de inspección, evaluación, pruebas y ensayos, revisión analítica, propuesta de intervención y soluciones constructivas, que tomen en cuenta los aspectos de resistencia, ductilidad, comportamiento y estabilidad de la estructura.

2 DESCRIPCIÓN DEL TRABAJO DE OFICINA

De acuerdo a los planos arquitectónicos y visitas realizadas en campo se procedió al desarrollo del estudio y análisis estructural con la ayuda de diferentes programas tales como ETABS v9.7.4, el cual tiene en cuenta los efectos de segundo orden. Por otro lado se siguieron las recomendaciones descrita en el respectivo estudio de suelos

3 DESCRIPCIÓN DE LOS CRITERIOS BÁSICOS DE DISEÑO

El proyecto se soluciona mediante el diseño de una estructura aporticada, utilizando para el entrepiso del nivel N:0.00 m Y N:+4.00 m, placa maciza en dos direcciones de espesor e=0.10 m y placa maciza de 0.12 m para soportar la carga del tanque en el nivel N:7.50 m. La cubierta liviana se compone de perfiles y correas entre el nivel N:+7.50 m y N:10.12 m. Se manejan luces entre 6.00 m y 9.50 m en los dos sentidos de la estructura.

4 NORMAS Y CÓDIGOS A LOS CUALES SE CIÑEN LOS DISEÑOS

El diseño de todas las estructuras se realizó basado en la Norma Colombiana de Diseño y Construcción Sismo Resistente Ley 400 de 1997 (Modificada Ley 1229 de 2008) y Decreto 926 de Marzo de 2010, Decreto 092 del 17 de Enero de 2011, Decreto 0340 del 13 de Febrero de 2012 y en el Reglamento para Concreto Estructural ACI 318S-08.

5 DESCRIPCIÓN DE LA METODOLOGÍA DE DISEÑO EMPLEADA.

El proyecto se soluciona mediante el diseño de una estructura aporticada, utilizando para el entrepiso del nivel N:0.00 m Y N:+4.00 m, placa maciza en dos direcciones de espesor e=0.10 m y placa maciza de 0.12 m para soportar la carga del tanque en el nivel N:7.50 m. La cubierta liviana se compone de perfiles y correas entre el nivel N:+7.50 m y N:10.12 m. Se manejan luces entre 6.00 m y 9.50 m en los dos sentidos de la estructura.

Las cargas horizontales fueron distribuidas entre los diferentes pórticos en proporción a su rigidez y teniendo en cuenta los efectos de torsión.

El dimensionamiento dado a todos los elementos que intervienen en las estructuras satisfacen los requerimientos de solicitación ocasionados por las derivas presentes. Las cargas vivas de diseño son: **5.00 kN/ m²** para tanques, y **0.35 kN/ m²** para cubiertas.

Para la cimentación se siguieron las recomendaciones descritas en el respectivo estudio de suelos, que recomienda apoyar la estructura a **-2.50 m** del nivel de la placa aérea de cimentación, apoyando las zapatas a **-1.90 m**, según lo indicado en los planos estructurales. La capacidad portante de seguridad admisible del suelo es **0.12 MPa** y el tipo de suelo es **E**.

6 DESCRIPCIÓN Y ANÁLISIS DE LAS CONDICIONES EXISTENTES

El sitio donde se procederá a la construcción de la estructura se encuentra ubicado una edificación existente, como se evidenciara en las fotos mostradas a continuación.

1. Fotografía Estructura existente

Fuente: Propia

2. Fotografía Estructura existente

Fuente: Propia

3. Fotografía Estructura existente

Fuente: Propia

4. Fotografía Estructura existente

Fuente: Propia

MEMORIAL DE RESPONSABILIDAD

JAMUNDI, Mayo de 2017.

Señores
PLANEACION MUNICIPAL
La Ciudad

Yo, **EDGAR ROLANDO BARRERA,** ingeniero civil con Matrícula Profesional Nº **15202-102710** de **BOYACÁ,** debidamente registrado en el consejo profesional de Ingeniería y Arquitectura de Boyacá, presento los cálculos y diseños estructurales elaborados de acuerdo a los requerimientos de la **NORMA COLOMBIANA DE DISEÑO Y CONSTRUCCIÓN SISMO RESISTENTE LEY 400 DE 1997 (MODIFICADA LEY 1229 DE 2008) Y DECRETO 926 DE MARZO DE 2010**, para el I.E. SIXTO MARIA ROJAS ubicado en el municipio de JAMUNDI (VALLE DEL CAUCA), declaro que asumo la responsabilidad por los perjuicios que causa de ellos puedan deducirse, exonerando a PLANEACION de cualquier responsabilidad.

Acepto y reconozco que la revisión efectuada por PLANEACION no constituye una aprobación al Diseño Estructural, sino una verificación del cumplimiento de la **NORMA COLOMBIANA DE DISEÑO Y CONSTRUCCIÓN SISMO RESISTENTE**.

Atentamente,

_____

EDGAR ROLANDO BARRERA

ING. ESTRUCTURAL

T.P. 15202-102710 BYC


REPUBLICA DE COLOMBIA
CONSEJO PROFESIONAL NACIONAL DE INGENIERIA
Y SUS PROFESIONES AUXILIARES
MAT. No 15202103710BYC
INGENIERO CIVIL
FECHA 18/12/2003
BARRERA SALINAS
EDGAR ROLANDO
C.C. 7175981
UNIVERSIDAD PEDAGOGICA Y
TECNOLOGICA DE COLOMBIA
PRESIDENTE DEL CONSEJO

7 MEMORIA DE CÁLCULO

7.1 AVALUO DE CARGAS

1. CUBIERTA LIVIANA

Teja termo-acústica		0.20 kN/m²
Correas Metálicas		0.10 kN/m²
Acabados e iluminacion		0.10 kN/m²
	CM	0.40 kN/m²
	CV	0.35 kN/m²
	CR	0.75 kN/m²

CU = 1.2x0.4+1.6x0.35 = 1.04 kN/m²

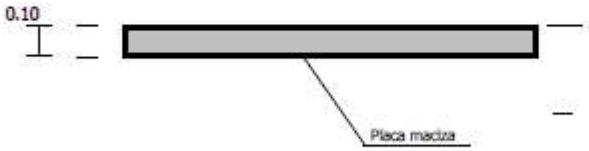
Espesor de placa equivalente:

e=CM/24 0.017 m

Pendiente de Cubierta α (°) = 8.5 → Equivale a 14.9%

Según la tabla B.4.2.1-2 - En cubiertas inclinadas con más de 15° de pendiente en estructura metálica o de madera la carga viva asumida puede ser 0.35 kN/m².
Según B.4.8.3.1 - Las cargas de granizo deben tenerse en cuenta en las regiones del país con más de 2.000 metros de altura sobre el nivel del mar o en lugares de menor altura donde la autoridad municipal o distrital así lo exija.
Según B.4.8.3.2 - Para cubiertas con inclinación mayor a 15% el valor de la carga viva para granizo puede reducirse a 0.50 kN/m².

2.PLACA MACIZA ENTREPISO: AULAS Y CORREDORES



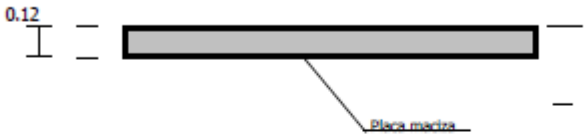
Placa maciza e=0.1m	0.1x24	2.40 kN/m²
Impermeabilización	20x0.05	1.00 kN/m²
	CM	3.40 kN/m²
	CV	5.00 kN/m²
	CR	8.40 kN/m²

CU = 1.2x3.4+1.6x5 = 12.1 kN/m²

Espesor de placa equivalente:

e=CM/24 0.142 m

3.PLACA MACIZA CUBIERTA: ZONA DE TANQUES



Placa maciza e=0.12m	0.12x24		2.88 kN/m²
Impermeabilización	20x0.05		1.00 kN/m²
		CM	3.88 kN/m²
		CV	5.00 kN/m²
		CR	8.88 kN/m²

CU = 1.2x3.88+1.6x5 = *12.7 kN/m²*

Espesor de placa equivalente:

e=CM/24 0.162 m

7.1.1 AVALUO CARGAS DE VIENTO

Para que le análisis se pueda realizar mediante el método de diseño simplificado se requiere que se cumpla con lo establecido por la NSR-10 titulo B.6.4.1.1. y B.6.4.1.2.

a - El edificio sea de diafragma simple como se define en la sección B.6.2.
b - El edificio sea bajo de acuerdo con lo establecido con la sección B.6.2.
c - El edificio sea cerrado como se define en la sección B.6.2. y cumpla las provisiones de zonas propensas a huracanes de acuerdo con la sección B.6.5.9.3.
d - El edificio sea de forma regular como se define en la sección B.6.2.
e - El edificio no sea clasificado como flexible como se define en la sección B.6.2.
f - Las características de respuesta del edificio sean tales que el mismo no esté sujeto a las cargas por viento a travéz de él, a generación de vórtices, a inestabilidad por golpeteo o aleteo, y no esté ubicado en un sitio en el que se puedan presentar efectos de canalización o sacudimiento por la estela de obstrucciones en barlovento, que obliguen a concideraciones especiales.
g - El edificio tenga una sección transversal aproximadamente simétrica en cada dirección y tenga una cubierta plana o cubierta a dos o cuatro aguas con ángulo de inclinación $\emptyset \leq 45°$
h - El edificio esta eximido de los casos de carga torsional indicados en la nota 5 de la figura B.6.5.7. o estos casos no conctrolan el diseño de ninguno de los elementos del SPRFV del edificio.

De los anteriores parametros se observa que la edificación cumple con lo estipulado, por lo tanto:

Tipo de análisis permitido: ANÁLISIS SIMPLIFICADO

Entonces: $$Ps = \lambda K_{zt} I P_{s10}$$

Donde:

- λ= Factor de ajuste por altura y exposición, figura B.6.4.2.
- K_{zt}= Factor topográfico comose define en la sección B.6.5.7. evaluado a la altura promedio de la cubierta, **h**, B.6.5.1.
- I= Factor de importancia como se define en la sección B.6.5.5.
- P_{s10}= Presión de viento de diseño simplificado para la categoria de exposición **B**, con **h=10** m de la figura B.6.4.2.

	CIUDAD	ZONA	VELOCIDAD DEL VIENTO
Zona de amenza eólica=	CALI	3	100 Km/h

Luego:

λ=	1.0
K_{zt}=	1.0
I=	1.25
P_{s10}=	**0.23**

Según B.6.4.2.1.1. Presiones mínimas: Los efectos de carga de las presiones de viento de diseño de la sección B.6.4.2.1. no serán menores que el caso de carga mínima de la sección B.6.1.3.1. suponiendo presiones Ps, de +0.40 kN/m^2 para las zonas de A, B, C y D y de 0.00 kN/m^2 paras las zonas E, F, G y H.

Por lo tanto la carga de viento a emplear es: **0.40** kN/m^2

7.2 ANALISIS SISMICO

7.2.1 ESPECTRO DE DISEÑO

ZONA DE AMENAZA SÍSMICA
ALTA

EFECTOS LOCALES

Perfil de Suelo	E
Coeficiente Aa	0.25
Coeficiente Av	0.25

COEFICIENTE DE IMPORTANCIA

Grupo de Uso	III
Coeficiente de importancia I	1.25

PERIODO FUNDAMENTAL DE LA EDIFICACIÓN

$T_a = C_t h^{\alpha}$		
C_t =	0.047	
h =	10.12	m
α =	0.90	
T_a =	0.38	Seg

VARIACIÓN COEFICIENTE DE CAPACIDAD DE DISIPACIÓN DE ENERGÍA

Ro: Coeficiente de capacidad de disipación de energía básico
R: Coeficiente de capacidad de disipación de energía, para ser empleado en el diseño.
ϕ_a: Coeficiente de reducción de R causado por irregularidades en altura de la edificación
ϕ_p: Coeficiente de reducción de R causado por irregularidades en planta de la edificación
ϕ_r: Coeficiente de reducción de R causado por ausencia de redundancia en el sistema estructural de resistencia sísmica

Ro	7.00
ϕ_a	1.00
ϕ_p	1.00
ϕ_r	0.75
ϕ	1.00
R	5.25

TIPO	DESCRIPCION	VALOR
		ϕ_a: 1.00
		ϕ_p: 1.00
	REDUNDANCIA	ϕ_r: 0.75
	UNIONES SOLDADAS	ϕ: 1.00

Fa: Factor de ampliación de la aceleración.
Fv: Factor de ampliación de la aceleración en el rango de velocidades constantes.
Sa: Valor del espectro de aceleraciones de diseño para un periodo de vibración dado.
Aa: Coeficiente que representa la aceleración horizontal pico efectiva para diseño.
Av: Coeficiente que representa la velocidad horizontal pico efectiva para diseño.
T: Periodo de vibración del sistema elástico, en segundos.
Tc: Periodo de vibración, en segundos, correspondiente a la transición entre la zona de aceleración constante del espectro de diseño, para periodos cortos, y la parte descendiente del mismo.
Tl: Periodo de vibración, en segundos, correspondiente al inicio de la zona de desplazamiento aproximadamente constante del espectro de diseño para periodos largos.

ZONA DE AMENAZA ALTA		
To:	0.21	Seg
Tc:	0.99	Seg
Tl:	7.20	Seg
Aa:	0.25	
Av:	0.25	
Fa:	1.45	
Fv:	3.00	

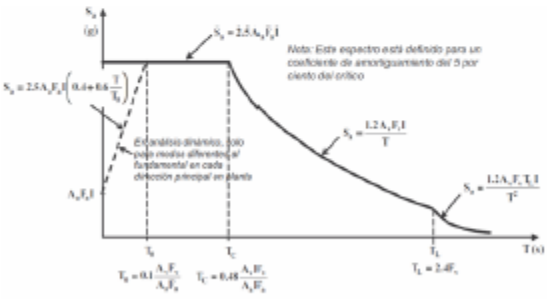
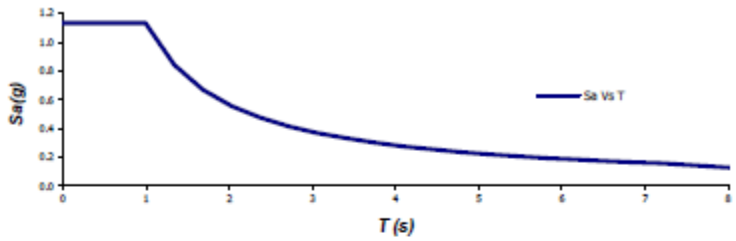


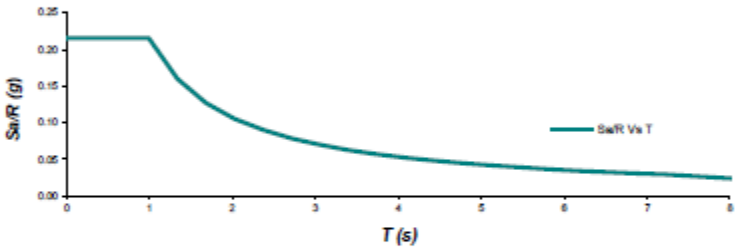
Figura A.2.6-1 — Espectro Elástico de Aceleraciones de Diseño como fracción de g

T (Seg)	Sa (%g)	$Sa/R_{adoptado}$ (%g)
0.00	1.133	0.216
0.05	1.133	0.216
0.10	1.133	0.216
0.16	1.133	0.216
0.21	1.133	0.216
0.40	1.133	0.216
0.60	1.133	0.216
0.80	1.133	0.216
0.99	1.133	0.216
1.34	0.841	0.160
1.68	0.669	0.127
2.03	0.555	0.106
2.37	0.474	0.090
2.72	0.414	0.079
3.06	0.367	0.070
3.41	0.330	0.063
3.75	0.300	0.057
4.10	0.275	0.052
4.44	0.253	0.048
4.79	0.235	0.045
5.13	0.219	0.042
5.48	0.205	0.039
5.82	0.193	0.037
6.17	0.182	0.035
6.51	0.173	0.033
6.86	0.164	0.031
7.20	0.156	0.030
8.20	0.120	0.023
9.20	0.096	0.018

Espectro Elástico de Diseño



Espectro Elástico de Diseño/R_{adop}



Sistema de resistencia Sísmica: Pórticos resistentes a momentos con Capacidad Especial de Disipación de Energía (DES).

Nota: El sistema de pórtico es un sistema estructural compuesto por un pórtico espacial, resistente a momentos, esencialmente completo, sin diagonales, que resiste todas las cargas verticales y las fuerzas horizontales.

MODELO MATEMÁTICO

Modelo Tridimensional con Diafragma Rígido: En este modelo los entrepisos se consideran diafragmas infinitamente rigidos en su propio plano. La masa de cada diafragma se considera concentrada en su centro de masa. Los efectos torsionales accidentales son incluidos haciendo ajustes en la localización de los centros de masa de los diafragmas.
Los efectos direccionales son tomados en cuenta a través de las componentes de los desplazamientos de los grados de libertad horizontales ortogonales del diafragma.

7.2.2 ESPECTRO DE UMBRAL DE DAÑO

ZONA DE AMENAZA SÍSMICA
ALTA

EFECTOS LOCALES

Perfil de Suelo	E
Coeficiente Ad	0.27
Coeficiente Fv	2.99

COEFICIENTE DE IMPORTANCIA

Grupo de Uso	III
Coeficiente de importancia I	1.25
Coeficiente de Sitio S:	3.74

ESPECTRO DE DISEÑO

Sad: Valor del espectro de aceleraciones del umbral de daño para un periodo de vibración dado.
Ad: Máxima aceleración pico efectiva para el umbral de daño.
T: Periodo de vibración del sistema elástico, en segundos.
T_{Cd}: Periodo de vibración, en segundos, correspondiente a la transición entre la zona de aceleración constante del espectro sísmico del umbral de daño, para periodos cortos, y la parte descendiente del mismo.
T_{Ld}: Periodo de vibración, en segundos, correspondiente a la transición entre la zona de desplazamiento constante del espectro sísmico del umbral de daño, para periodos largos.

Ad: 0.27
T_{Cd}: 1.87 Seg
T_{Ld}: 8.97 Seg

T (Seg)	Sad (%g)
0.00	0.270
0.05	0.378
0.10	0.486
0.15	0.594
0.20	0.702
0.25	0.810
0.45	0.810
0.65	0.810
0.86	0.810
1.06	0.810
1.26	0.810

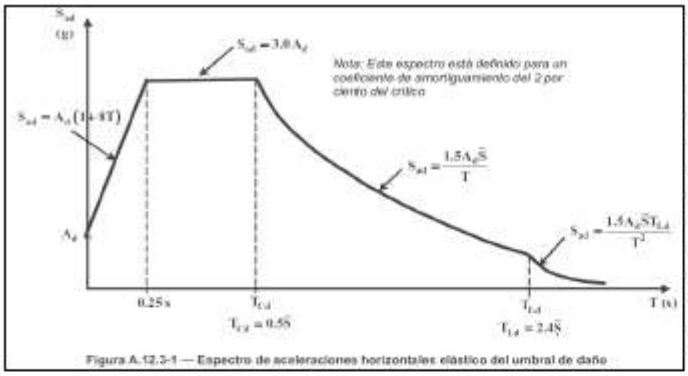
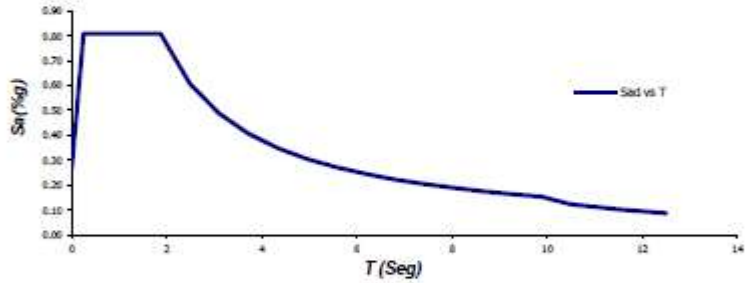


Figura A.12.3-1 — Espectro de aceleraciones horizontales elástico del umbral de daño

2.49	0.609
3.10	0.488
3.72	0.407
4.33	0.349
4.95	0.306
5.57	0.272
6.18	0.245
6.80	0.223
7.42	0.204
8.03	0.188
8.65	0.175
9.27	0.163
9.88	0.153
10.50	0.123
11.50	0.103
12.50	0.087

Espectro Del Umbral de Daño



Sistema de resistencia Sísmica: Pórticos resistentes a momentos con Capacidad Especial de Disipación de Energía (DES).

Nota: El sistema de pórtico es un sistema estructural compuesto por un pórtico espacial, resistente a momentos, esencialmente completo, sin diagonales, que resiste todas las cargas verticales y las fuerzas horizontales.

MODELO MATEMÁTICO

Modelo Tridimensional con Diafragma Rígido: En este modelo los entrepisos se consideran diafragmas infinitamente rigidos en su propio plano. La masa de cada diafragma se considera concentrada en su centro de masa. Los efectos torsionales accidentales son incluidos haciendo ajustes en la localización de los centros de masa de los diafragmas.
Los efectos direccionales son tomados en cuenta a través de las componentes de los desplazamientos de los grados de libertad horizontales ortogonales del diafragma.

7.2.3 CALCULO CORTANTE BASAL

$H_{edificio}$ =	10.12	m	
Tipo de Perfil:	E		
Aa =	0.25		
Av =	0.25		
Fa =	1.45		
Fv =	3.00		
T_C =	0.99	Seg	
C_t =	0.047		
α =	0.90		
T_a =	0.38	Seg	
C_u =	1.20		
$C_u T_a$ =	0.45	Seg	
$T_{modelación\ estructural}$ =	0.40	Seg	
ΔT =	6.00	%	Ok!
$T_{adoptado}$ =	0.40	Seg	
S_a =	1.130		S_a obtenido del espectro de diseño
g =	9.81	m/s^2	
M =	386.60	Ton	Masa obtenida del modelo
V_s =	4285.58	kN	
90% Vs =	3857.02	kN	Cortante basal para comparación de acuerdo a A.5.4.5 NSR-10

MODELO INICIAL
Response Espectrum Base Reactions

PORCENTAJE PARA REVISIÓN DE CORTANTE BASAL DE ACUERDO A A.5.4.5 NSR-10: 90.0 %

	F1	F2	Total	Factor		g corregido
$V_{s(x)}$ =	3056.86	128.27	3059.55	1.261	12.367	Se aplica en SISMO X
$V_{s(y)}$ =	128.27	3501.09	3503.44	1.101	10.800	Se aplica en SISMO Y

MODELO CORREGIDO
Response Espectrum Base Reactions

	F1	F2	Total	90% Vs
$V_{s(x)}$ =	3379.68	198.87	3385.53	3857.0
$V_{s(y)}$ =	173.77	3501.16	3505.47	3857.0

7.2.4 CALCULO CORTANTE BASAL-UMBRAL

$H_{edificio}$ =	10.12	m	
Tipo de Perfil:	E		
Ad =	0.05		
Fv =	3.50		
C_t =	0.047		
α =	0.90		
T_a =	0.38	Seg	
C_u =	1.20		
$C_u T_a$ =	0.45	Seg	
$T_{modelación\ estructural}$ =	0.40	Seg	
ΔT =	6.00	%	Ok!
$T_{adoptado}$ =	0.38	Seg	
S_a =	1.130		S_a obtenido del espectro de diseño
g =	9.81	m/s^2	
M =	386.60	Ton	Masa obtenida del modelo
V_s =	4285.58	kN	
	456.23		

MODELO INICIAL
Response Espectrum Base Reactions

PORCENTAJE PARA REVISIÓN DE CORTANTE BASAL DE ACUERDO A A.5.4.5 NSR-10: 100.0 %

	F1	F2	Total	Factor		g corregido
$V_{s(x)}$ =	2181.78	91.67	2183.70	1.963	19.252	Se aplica en SISMO X
$V_{s(y)}$ =	91.67	2502.36	2504.04	1.711	16.789	Se aplica en SISMO Y
	3739.68	580.8				

MODELO CORREGIDO
Response Espectrum Base Reactions

	F1	F2	Total	100% Vs
$V_{s(x)}$ =	3757.62	220.98	3764.11	4285.6
$V_{s(y)}$ =	191.7	3869.57	3874.32	4285.6

7.2.5 DERIVAS

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS FUERZA SÍSMICA Desplazamiento X	Desplazamiento Y	Deriva Δ m	Deriva Δ %	Observació
PISO2	144	COMDER1 MAX	0.034544	0.0238	0.01824	0.52	OK
PISO2	144	COMDER1 MIN	-0.034544	-0.0238	0.01824	0.52	OK
PISO2	144	COMDER2 MAX	0.017952	0.05542	0.02060	0.59	OK
PISO2	144	COMDER2 MIN	-0.017952	-0.05542	0.02060	0.59	OK
PISO1	144	COMDER1 MAX	0.018632	0.014892	0.02385	0.60	OK
PISO1	144	COMDER1 MIN	-0.018632	-0.014892	0.02385	0.60	OK
PISO1	144	COMDER2 MAX	0.009928	0.036448	0.03778	0.94	OK
PISO1	144	COMDER2 MIN	-0.009928	-0.036448	0.03778	0.94	OK
BASE	144	COMDER1 MAX	0	0	–	–	–
BASE	144	COMDER1 MIN	0	0	–	–	–
BASE	144	COMDER2 MAX	0	0	–	–	–
BASE	144	COMDER2 MIN	0	0	–	–	–
PISO2	145	COMDER1 MAX	0.034544	0.026384	0.01868	0.53	OK
PISO2	145	COMDER1 MIN	-0.034544	-0.026384	0.01868	0.53	OK
PISO2	145	COMDER2 MAX	0.017952	0.052972	0.01966	0.56	OK
PISO2	145	COMDER2 MIN	-0.017952	-0.052972	0.01966	0.56	OK
PISO1	145	COMDER1 MAX	0.018632	0.016592	0.02495	0.62	OK
PISO1	145	COMDER1 MIN	-0.018632	-0.016592	0.02495	0.62	OK
PISO1	145	COMDER2 MAX	0.009928	0.03502	0.03640	0.91	OK
PISO1	145	COMDER2 MIN	-0.009928	-0.03502	0.03640	0.91	OK
BASE	145	COMDER1 MAX	0	0	–	–	–
BASE	145	COMDER1 MIN	0	0	–	–	–
BASE	145	COMDER2 MAX	0	0	–	–	–
BASE	145	COMDER2 MIN	0	0	–	–	–
PISO2	150	COMDER1 MAX	0.03434	0.0238	0.01812	0.52	OK
PISO2	150	COMDER1 MIN	-0.03434	-0.0238	0.01812	0.52	OK
PISO2	150	COMDER2 MAX	0.01326	0.05542	0.01991	0.57	OK
PISO2	150	COMDER2 MIN	-0.01326	-0.05542	0.01991	0.57	OK
PISO1	150	COMDER1 MAX	0.018564	0.014892	0.02380	0.59	OK
PISO1	150	COMDER1 MIN	-0.018564	-0.014892	0.02380	0.59	OK
PISO1	150	COMDER2 MAX	0.007208	0.036448	0.03715	0.93	OK
PISO1	150	COMDER2 MIN	-0.007208	-0.036448	0.03715	0.93	OK
BASE	150	COMDER1 MAX	0	0	–	–	–
BASE	150	COMDER1 MIN	0	0	–	–	–
BASE	150	COMDER2 MAX	0	0	–	–	–
BASE	150	COMDER2 MIN	0	0	–	–	–
PISO2	151	COMDER1 MAX	0.03434	0.026384	0.01857	0.53	OK
PISO2	151	COMDER1 MIN	-0.03434	-0.026384	0.01857	0.53	OK
PISO2	151	COMDER2 MAX	0.01326	0.052972	0.01894	0.54	OK
PISO2	151	COMDER2 MIN	-0.01326	-0.052972	0.01894	0.54	OK
PISO1	151	COMDER1 MAX	0.018564	0.016592	0.02490	0.62	OK
PISO1	151	COMDER1 MIN	-0.018564	-0.016592	0.02490	0.62	OK
PISO1	151	COMDER2 MAX	0.007208	0.03502	0.03575	0.89	OK
PISO1	151	COMDER2 MIN	-0.007208	-0.03502	0.03575	0.89	OK
BASE	151	COMDER1 MAX	0	0	–	–	–
BASE	151	COMDER1 MIN	0	0	–	–	–
BASE	151	COMDER2 MAX	0	0	–	–	–
BASE	151	COMDER2 MIN	0	0	–	–	–
PISO2	156	COMDER1 MAX	0.043316	0.0238	0.02145	0.61	OK
PISO2	156	COMDER1 MIN	-0.043316	-0.0238	0.02145	0.61	OK
PISO2	156	COMDER2 MAX	0.016048	0.05542	0.02027	0.58	OK
PISO2	156	COMDER2 MIN	-0.016048	-0.05542	0.02027	0.58	OK
PISO1	156	COMDER1 MAX	0.0238	0.014892	0.02808	0.70	OK
PISO1	156	COMDER1 MIN	-0.0238	-0.014892	0.02808	0.70	OK
PISO1	156	COMDER2 MAX	0.008908	0.036448	0.03752	0.94	OK
PISO1	156	COMDER2 MIN	-0.008908	-0.036448	0.03752	0.94	OK
BASE	156	COMDER1 MAX	0	0	–	–	–
BASE	156	COMDER1 MIN	0	0	–	–	–
BASE	156	COMDER2 MAX	0	0	–	–	–
BASE	156	COMDER2 MIN	0	0	–	–	–
PISO2	157	COMDER1 MAX	0.043316	0.026384	0.02183	0.62	OK
PISO2	157	COMDER1 MIN	-0.043316	-0.026384	0.02183	0.62	OK
PISO2	157	COMDER2 MAX	0.016048	0.052972	0.01932	0.55	OK
PISO2	157	COMDER2 MIN	-0.016048	-0.052972	0.01932	0.55	OK

ALTURA DE CUB2	0.45	m
ALTURA DE CUB1	2.17	m
ALTURA DE PISO2	3.50	m
ALTURA DE PISO1	4.00	m
ALTURA DE BASE	0.00	m

Deriva Máxima Permitida 1.00 %

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS FUERZA SÍSMICA Desplazamiento X	Desplazamiento Y	Deriva Δ m	Deriva Δ %	Observación
PISO1	157	COMDER1 MAX	0.0238	0.016592	0.02901	0.73	OK
PISO1	157	COMDER1 MIN	-0.0238	-0.016592	0.02901	0.73	OK
PISO1	157	COMDER2 MAX	0.008908	0.03502	0.03614	0.90	OK
PISO1	157	COMDER2 MIN	-0.008908	-0.03502	0.03614	0.90	OK
BASE	157	COMDER1 MAX	0	0	--	--	--
BASE	157	COMDER1 MIN	0	0	--	--	--
BASE	157	COMDER2 MAX	0	0	--	--	--
BASE	157	COMDER2 MIN	0	0	--	--	--
PISO2	162	COMDER1 MAX	0.059772	0.0238	0.02791	0.80	OK
PISO2	162	COMDER1 MIN	-0.059772	-0.0238	0.02791	0.80	OK
PISO2	162	COMDER2 MAX	0.025704	0.05542	0.02201	0.63	OK
PISO2	162	COMDER2 MIN	-0.025704	-0.05542	0.02201	0.63	OK
PISO1	162	COMDER1 MAX	0.03332	0.014892	0.03650	0.91	OK
PISO1	162	COMDER1 MIN	-0.03332	-0.014892	0.03650	0.91	OK
PISO1	162	COMDER2 MAX	0.014552	0.036448	0.03925	0.98	OK
PISO1	162	COMDER2 MIN	-0.014552	-0.036448	0.03925	0.98	OK
BASE	162	COMDER1 MAX	0	0	--	--	--
BASE	162	COMDER1 MIN	0	0	--	--	--
BASE	162	COMDER2 MAX	0	0	--	--	--
BASE	162	COMDER2 MIN	0	0	--	--	--
PISO2	163	COMDER1 MAX	0.059772	0.026384	0.02821	0.81	OK
PISO2	163	COMDER1 MIN	-0.059772	-0.026384	0.02821	0.81	OK
PISO2	163	COMDER2 MAX	0.025704	0.052972	0.02113	0.60	OK
PISO2	163	COMDER2 MIN	-0.025704	-0.052972	0.02113	0.60	OK
PISO1	163	COMDER1 MAX	0.03332	0.016592	0.03722	0.93	OK
PISO1	163	COMDER1 MIN	-0.03332	-0.016592	0.03722	0.93	OK
PISO1	163	COMDER2 MAX	0.014552	0.03502	0.03792	0.95	OK
PISO1	163	COMDER2 MIN	-0.014552	-0.03502	0.03792	0.95	OK
BASE	163	COMDER1 MAX	0	0	--	--	--
BASE	163	COMDER1 MIN	0	0	--	--	--
BASE	163	COMDER2 MAX	0	0	--	--	--
BASE	163	COMDER2 MIN	0	0	--	--	--

7.2.6 DERIVAS – UMBRAL

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS FUERZA SÍSMICA		Deriva Δ	Deriva Δ	Observación
			Desplazamiento X	Desplazamiento Y	m	%	
PISO2	144	COMDERUM1 MAX	0.01376	0.00946	0.00725	0.21	OK
PISO2	144	COMDERUM1 MIN	-0.01376	-0.00946	0.00725	0.21	OK
PISO2	144	COMDERUM2 MAX	0.00714	0.02212	0.00821	0.23	OK
PISO2	144	COMDERUM2 MIN	-0.00714	-0.02212	0.00821	0.23	OK
PISO1	144	COMDERUM1 MAX	0.00741	0.00597	0.00951	0.24	OK
PISO1	144	COMDERUM1 MIN	-0.00741	-0.00597	0.00951	0.24	OK
PISO1	144	COMDERUM2 MAX	0.00395	0.01455	0.01508	0.38	OK
PISO1	144	COMDERUM2 MIN	-0.00395	-0.01455	0.01508	0.38	OK
BASE	144	COMDERUM1 MAX	0.00000	0.00000	–	–	–
BASE	144	COMDERUM1 MIN	0.00000	0.00000	–	–	–
BASE	144	COMDERUM2 MAX	0.00000	0.00000	–	–	–
BASE	144	COMDERUM2 MIN	0.00000	0.00000	–	–	–
PISO2	145	COMDERUM1 MAX	0.01376	0.01053	0.00746	0.21	OK
PISO2	145	COMDERUM1 MIN	-0.01376	-0.01053	0.00746	0.21	OK
PISO2	145	COMDERUM2 MAX	0.00714	0.02117	0.00786	0.22	OK
PISO2	145	COMDERUM2 MIN	-0.00714	-0.02117	0.00786	0.22	OK
PISO1	145	COMDERUM1 MAX	0.00741	0.00661	0.00993	0.25	OK
PISO1	145	COMDERUM1 MIN	-0.00741	-0.00661	0.00993	0.25	OK
PISO1	145	COMDERUM2 MAX	0.00395	0.01398	0.01453	0.36	OK
PISO1	145	COMDERUM2 MIN	-0.00395	-0.01398	0.01453	0.36	OK
BASE	145	COMDERUM1 MAX	0.00000	0.00000	–	–	–
BASE	145	COMDERUM1 MIN	0.00000	0.00000	–	–	–
BASE	145	COMDERUM2 MAX	0.00000	0.00000	–	–	–
BASE	145	COMDERUM2 MIN	0.00000	0.00000	–	–	–
PISO2	150	COMDERUM1 MAX	0.01368	0.00946	0.00718	0.21	OK
PISO2	150	COMDERUM1 MIN	-0.01368	-0.00946	0.00718	0.21	OK
PISO2	150	COMDERUM2 MAX	0.00528	0.02212	0.00793	0.23	OK
PISO2	150	COMDERUM2 MIN	-0.00528	-0.02212	0.00793	0.23	OK
PISO1	150	COMDERUM1 MAX	0.00741	0.00597	0.00951	0.24	OK
PISO1	150	COMDERUM1 MIN	-0.00741	-0.00597	0.00951	0.24	OK
PISO1	150	COMDERUM2 MAX	0.00289	0.01455	0.01484	0.37	OK
PISO1	150	COMDERUM2 MIN	-0.00289	-0.01455	0.01484	0.37	OK
BASE	150	COMDERUM1 MAX	0.00000	0.00000	–	–	–
BASE	150	COMDERUM1 MIN	0.00000	0.00000	–	–	–
BASE	150	COMDERUM2 MAX	0.00000	0.00000	–	–	–
BASE	150	COMDERUM2 MIN	0.00000	0.00000	–	–	–
PISO2	151	COMDERUM1 MAX	0.01368	0.01053	0.00739	0.21	OK
PISO2	151	COMDERUM1 MIN	-0.01368	-0.01053	0.00739	0.21	OK
PISO2	151	COMDERUM2 MAX	0.00528	0.02117	0.00757	0.22	OK
PISO2	151	COMDERUM2 MIN	-0.00528	-0.02117	0.00757	0.22	OK
PISO1	151	COMDERUM1 MAX	0.00741	0.00661	0.00993	0.25	OK
PISO1	151	COMDERUM1 MIN	-0.00741	-0.00661	0.00993	0.25	OK
PISO1	151	COMDERUM2 MAX	0.00289	0.01398	0.01428	0.36	OK
PISO1	151	COMDERUM2 MIN	-0.00289	-0.01398	0.01428	0.36	OK
BASE	151	COMDERUM1 MAX	0.00000	0.00000	–	–	–
BASE	151	COMDERUM1 MIN	0.00000	0.00000	–	–	–
BASE	151	COMDERUM2 MAX	0.00000	0.00000	–	–	–
BASE	151	COMDERUM2 MIN	0.00000	0.00000	–	–	–
PISO2	156	COMDERUM1 MAX	0.01729	0.00946	0.00854	0.24	OK
PISO2	156	COMDERUM1 MIN	-0.01729	-0.00946	0.00854	0.24	OK
PISO2	156	COMDERUM2 MAX	0.00638	0.02212	0.00807	0.23	OK
PISO2	156	COMDERUM2 MIN	-0.00638	-0.02212	0.00807	0.23	OK
PISO1	156	COMDERUM1 MAX	0.00950	0.00597	0.01122	0.28	OK
PISO1	156	COMDERUM1 MIN	-0.00950	-0.00597	0.01122	0.28	OK
PISO1	156	COMDERUM2 MAX	0.00357	0.01455	0.01499	0.37	OK
PISO1	156	COMDERUM2 MIN	-0.00357	-0.01455	0.01499	0.37	OK
BASE	156	COMDERUM1 MAX	0.00000	0.00000	–	–	–
BASE	156	COMDERUM1 MIN	0.00000	0.00000	–	–	–
BASE	156	COMDERUM2 MAX	0.00000	0.00000	–	–	–
BASE	156	COMDERUM2 MIN	0.00000	0.00000	–	–	–
PISO2	157	COMDERUM1 MAX	0.01729	0.01053	0.00872	0.25	OK
PISO2	157	COMDERUM1 MIN	-0.01729	-0.01053	0.00872	0.25	OK
PISO2	157	COMDERUM2 MAX	0.00638	0.02117	0.00771	0.22	OK
PISO2	157	COMDERUM2 MIN	-0.00638	-0.02117	0.00771	0.22	OK
PISO1	157	COMDERUM1 MAX	0.00950	0.00661	0.01157	0.29	OK
PISO1	157	COMDERUM1 MIN	-0.00950	-0.00661	0.01157	0.29	OK
PISO1	157	COMDERUM2 MAX	0.00357	0.01398	0.01443	0.36	OK
PISO1	157	COMDERUM2 MIN	-0.00357	-0.01398	0.01443	0.36	OK
BASE	157	COMDERUM1 MAX	0.00000	0.00000	–	–	–

ALTURA DE CUB2	0.45	m		Deriva Máxima Permitida	0.40	%	
ALTURA DE CUB1	2.17	m					
ALTURA DE PISO2	3.50	m					
ALTURA DE PISO1	4.00	m					
ALTURA DE BASE	0.00	m					
BASE	157	COMDERUM1 MIN	0.00000	0.00000	--	--	--
BASE	157	COMDERUM2 MAX	0.00000	0.00000	--	--	--
BASE	157	COMDERUM2 MIN	0.00000	0.00000	--	--	--
PISO2	162	COMDERUM1 MAX	0.02383	0.00946	0.01109	0.32	OK
PISO2	162	COMDERUM1 MIN	-0.02383	-0.00946	0.01109	0.32	OK
PISO2	162	COMDERUM2 MAX	0.01022	0.02212	0.00875	0.25	OK
PISO2	162	COMDERUM2 MIN	-0.01022	-0.02212	0.00875	0.25	OK
PISO1	162	COMDERUM1 MAX	0.01330	0.00597	0.01458	0.36	OK
PISO1	162	COMDERUM1 MIN	-0.01330	-0.00597	0.01458	0.36	OK
PISO1	162	COMDERUM2 MAX	0.00581	0.01455	0.01567	0.39	OK
PISO1	162	COMDERUM2 MIN	-0.00581	-0.01455	0.01567	0.39	OK
BASE	162	COMDERUM1 MAX	0.00000	0.00000	--	--	--
BASE	162	COMDERUM1 MIN	0.00000	0.00000	--	--	--
BASE	162	COMDERUM2 MAX	0.00000	0.00000	--	--	--
BASE	162	COMDERUM2 MIN	0.00000	0.00000	--	--	--
PISO2	163	COMDERUM1 MAX	0.02383	0.01053	0.01123	0.32	OK
PISO2	163	COMDERUM1 MIN	-0.02383	-0.01053	0.01123	0.32	OK
PISO2	163	COMDERUM2 MAX	0.01022	0.02117	0.00843	0.24	OK
PISO2	163	COMDERUM2 MIN	-0.01022	-0.02117	0.00843	0.24	OK
PISO1	163	COMDERUM1 MAX	0.01330	0.00661	0.01485	0.37	OK
PISO1	163	COMDERUM1 MIN	-0.01330	-0.00661	0.01485	0.37	OK
PISO1	163	COMDERUM2 MAX	0.00581	0.01398	0.01514	0.38	OK
PISO1	163	COMDERUM2 MIN	-0.00581	-0.01398	0.01514	0.38	OK
BASE	163	COMDERUM1 MAX	0.00000	0.00000	--	--	--
BASE	163	COMDERUM1 MIN	0.00000	0.00000	--	--	--
BASE	163	COMDERUM2 MAX	0.00000	0.00000	--	--	--
BASE	163	COMDERUM2 MIN	0.00000	0.00000	--	--	--

7.3 DISEÑO DE CIMENTACION

DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INSTITUCIÓN EDUCATIVA DEL VALLE, SEDE SIXTO MARÍA ROJAS - COLEGIO

RESUMEN DISEÑO

CARGA ADMISIBLE 12.00 Ton/m² VERTICALES
CARGA ADMISIBLE I 15.96 Ton/m² SISMO

ZAPATA	B_x (m)	L_x (m)	H (m)	Q_{max} (Ton/m²) CARGA VERTICAL	Q_{max} (Ton/m²) SISMO	Q_{min} (Ton/m²)	CHEQUEO	TIPO DE ZAPATA	REFUERZO EN X	REFUERZO EN Y
C-2	3.00	3.00	0.60	9.73	14.66	0.86	O.K.		16 VARILLAS No. 6 L = 2.9 m. @ 17.06 cm.	16 VARILLAS No. 6 L = 2.9 m. @ 17.06 cm.
C-4	3.00	3.00	0.60	7.47	12.79	0.03	O.K.		14 VARILLAS No. 6 L = 2.9 m. @ 22.31 cm.	14 VARILLAS No. 6 L = 2.9 m. @ 22.31 cm.
B-4	3.10	3.10	0.60	9.17	14.87	-0.02	O.K.		19 VARILLAS No. 6 L = 3 m. @ 16.67 cm.	19 VARILLAS No. 6 L = 3 m. @ 16.67 cm.
C-3	3.10	3.10	0.60	9.66	12.93	2.61	O.K.		17 VARILLAS No. 6 L = 3 m. @ 18.75 cm.	17 VARILLAS No. 6 L = 3 m. @ 18.75 cm.
C-1	3.40	3.40	0.60	7.90	12.71	0.27	O.K.		23 VARILLAS No. 6 L = 3.3 m. @ 15 cm.	23 VARILLAS No. 6 L = 3.3 m. @ 15 cm.
B-1	3.60	3.60	0.60	9.60	14.29	0.85	O.K.		32 VARILLAS No. 6 L = 3.5 m. @ 11.29 cm.	32 VARILLAS No. 6 L = 3.5 m. @ 11.29 cm.
B-2	3.60	3.60	0.60	9.12	13.91	2.11	O.K.		28 VARILLAS No. 6 L = 3.5 m. @ 12.5 cm.	28 VARILLAS No. 6 L = 3.5 m. @ 12.5 cm.
B-3	3.60	3.60	0.60	9.39	12.95	2.99	O.K.		27 VARILLAS No. 6 L = 3.5 m. @ 13.46 cm.	27 VARILLAS No. 6 L = 3.5 m. @ 13.46 cm.

7.3.1 DISEÑO VIGAS DE AMARRE

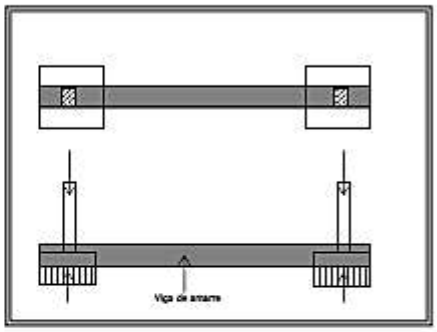
DISEÑO VIGAS DE AMARRE

PROYECTO: INSTITUCIÓN EDUCATIVA SIXTO MARIA

VIGA DE AMARRE TIPO

f'c = 21.1 MPa
fy = 420 MPa

b = 0.40 m
h = 0.40 m



Pmáx = 637.53 kN

De acuerdo a el numeral A.3.6.4.2
de la NSR-10 tenemos:

Aa = *0. 25*
Paxial = 0.25*Aa*Pmáx
Paxial = *23.9* kN

DISEÑO A TENSIÓN

As = 1.7*23.907375/(0.90*420)
As = 1.08 cm^2

DISEÑO A COMPRESIÓN

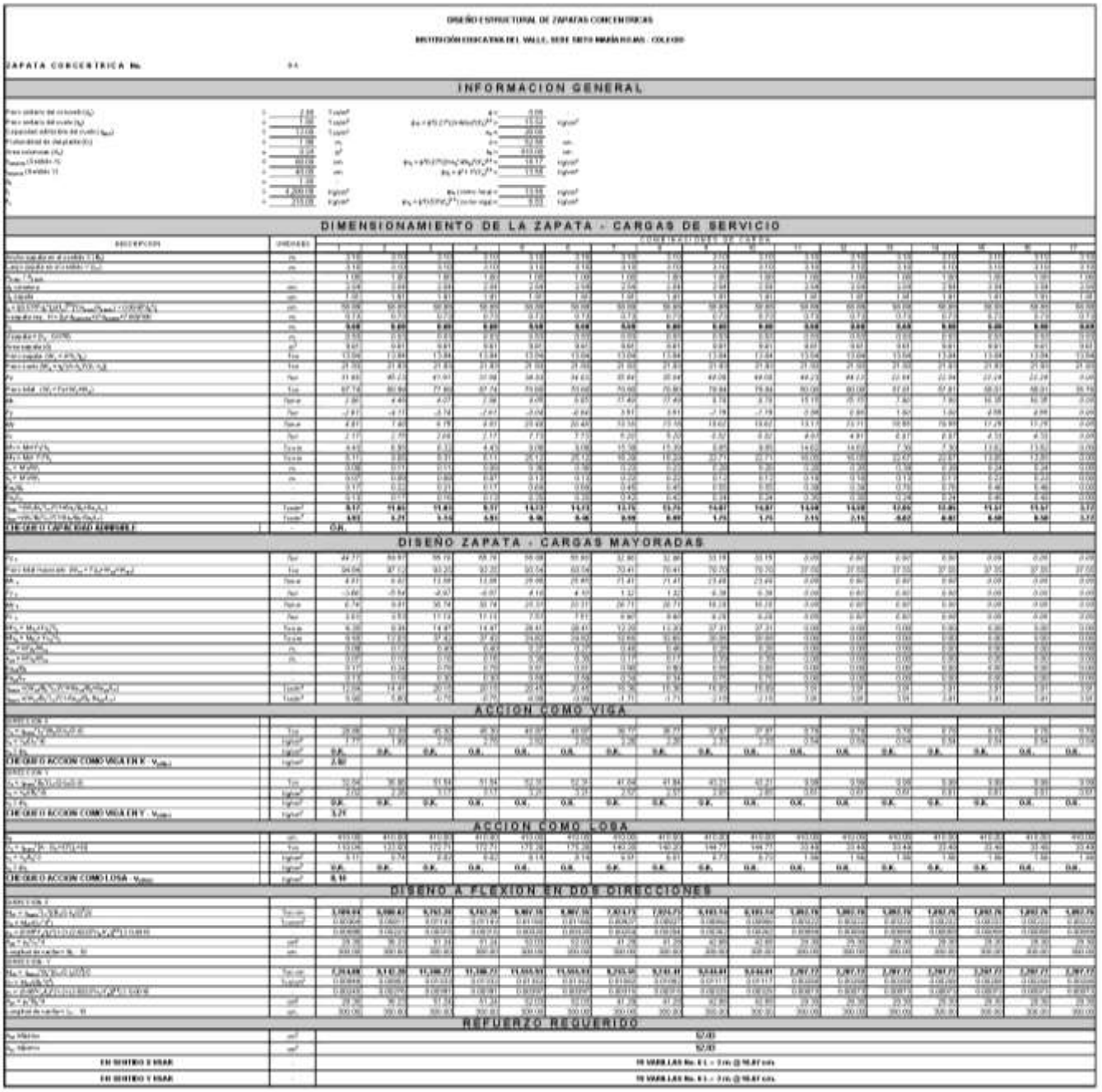
P com = 1.7*23.907375
P com = *40.6* kN

Para esta carga la sección requiere cuantía mínima:

As = 0.00333*0.4*0.35
As = 4.66 cm^2

Se suministra un refuerzo constituido por 4#4 arriba y abajo (como refuerzo mínimo).

7.3.2 DISEÑO DE ZAPATAS



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INSTITUCIÓN EDUCATIVA DEL VALLE, SEDE SIXTO MARÍA ROJAS - COLEGIO

ZAPATA CONCENTRICA No. 1

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

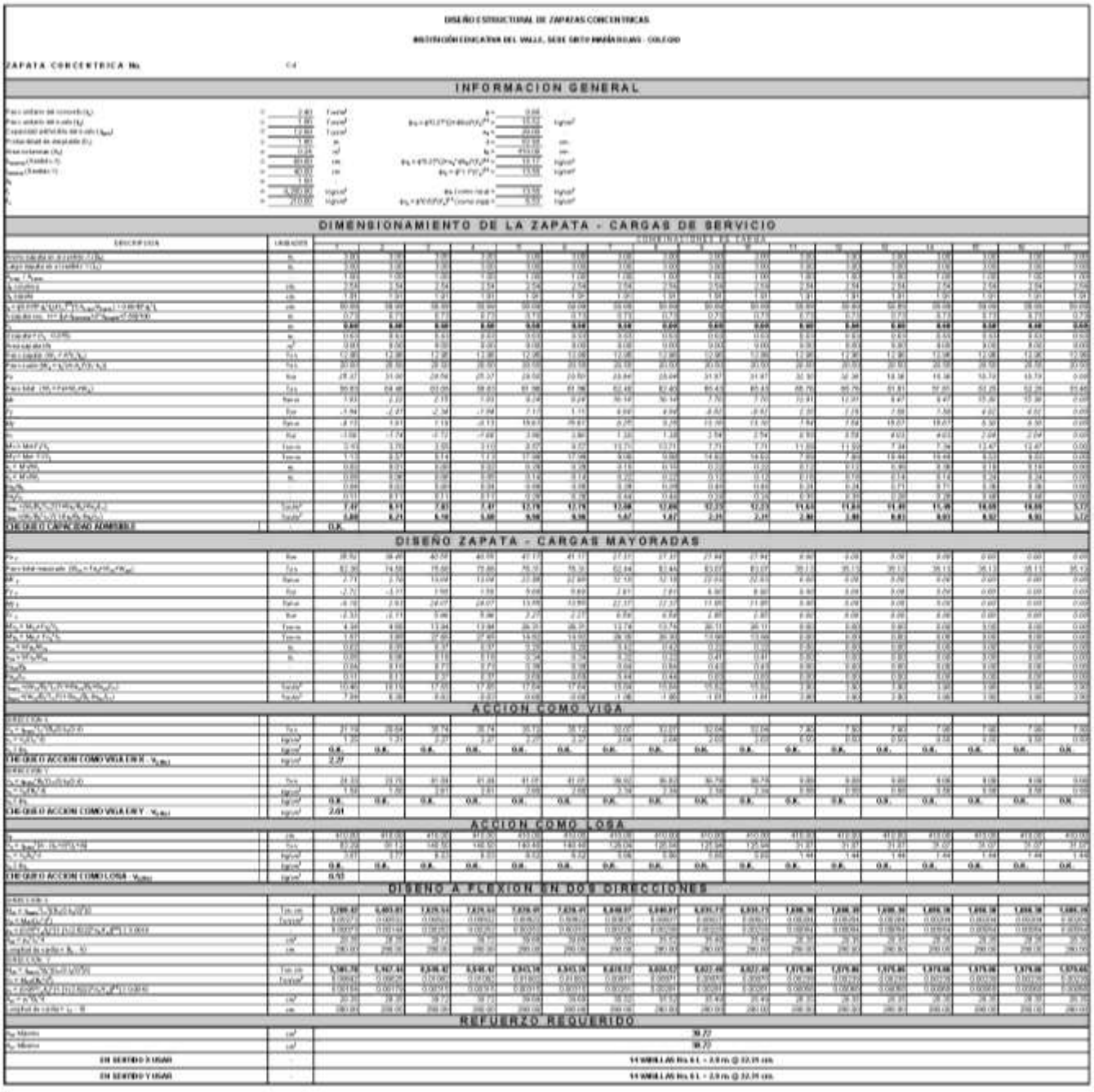
DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INSTITUCIÓN EDUCATIVA DEL VALLE, SEDE SIXTO MARÍA ROJAS - COLEGIO

ZAPATA CONCENTRICA No. C4

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

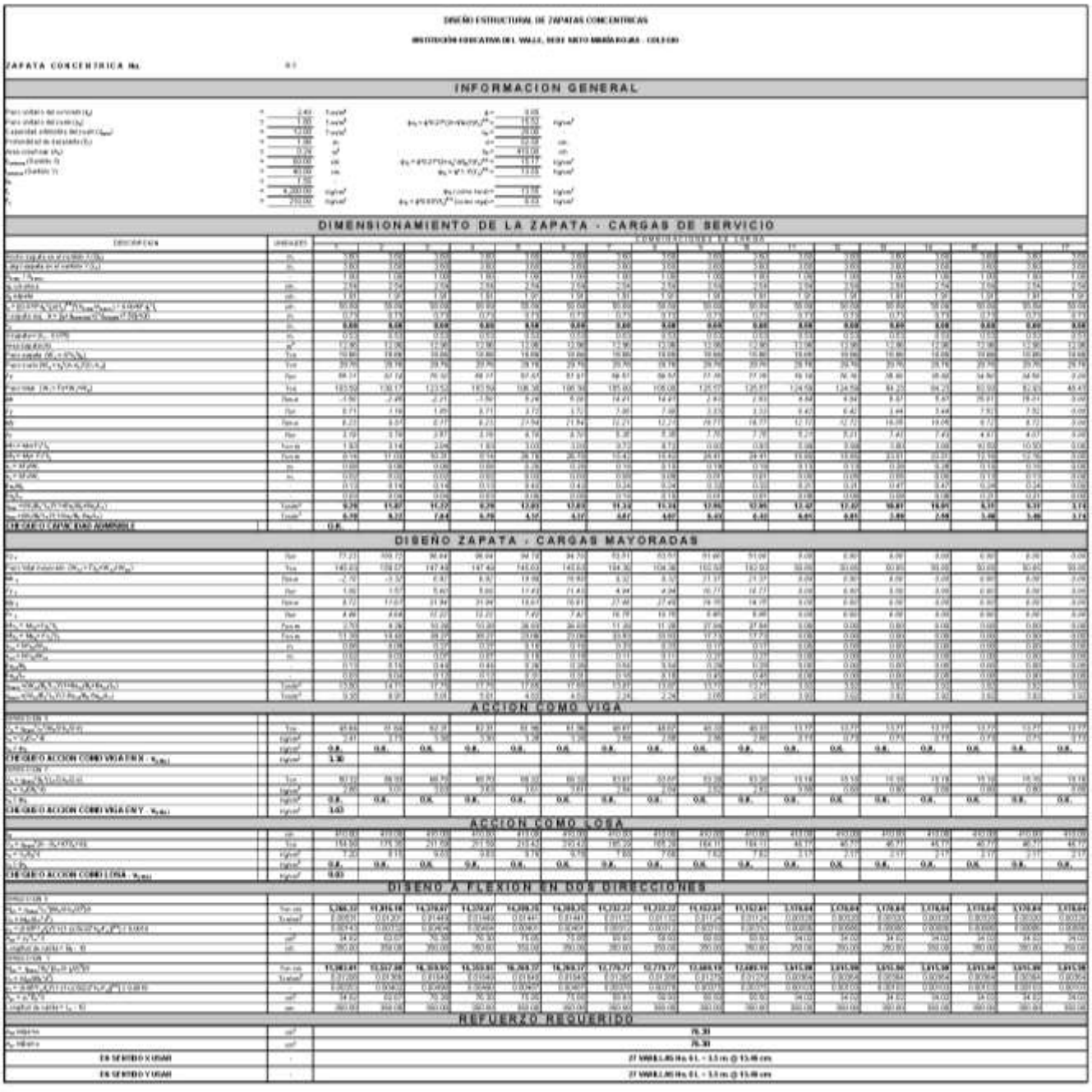
DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INSTITUCIÓN EDUCATIVA DEL VALLE, SEDE SIXTO MARÍA ROJAS - COLEGIO

ZAPATA CONCENTRICA No.

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

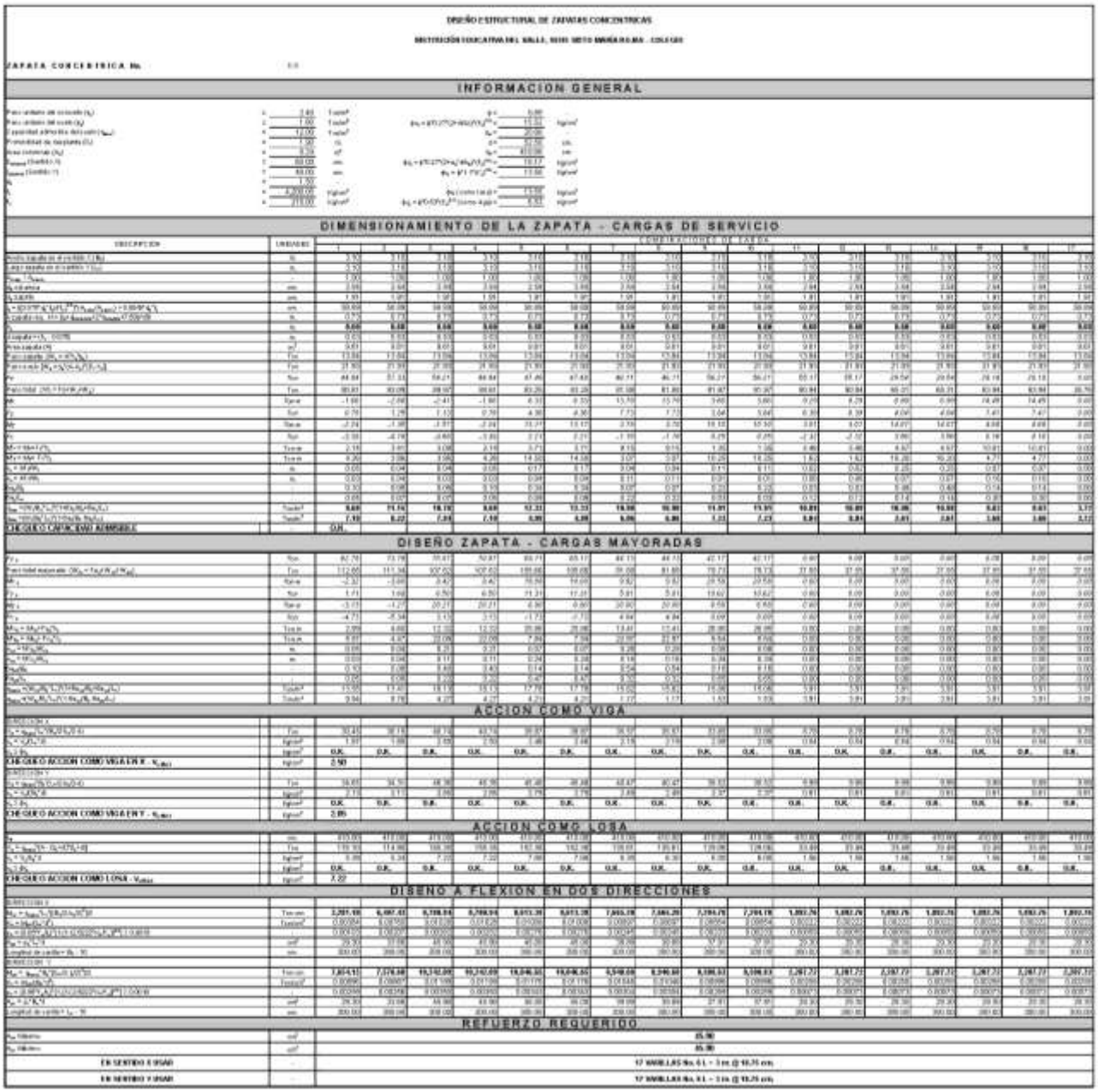
DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

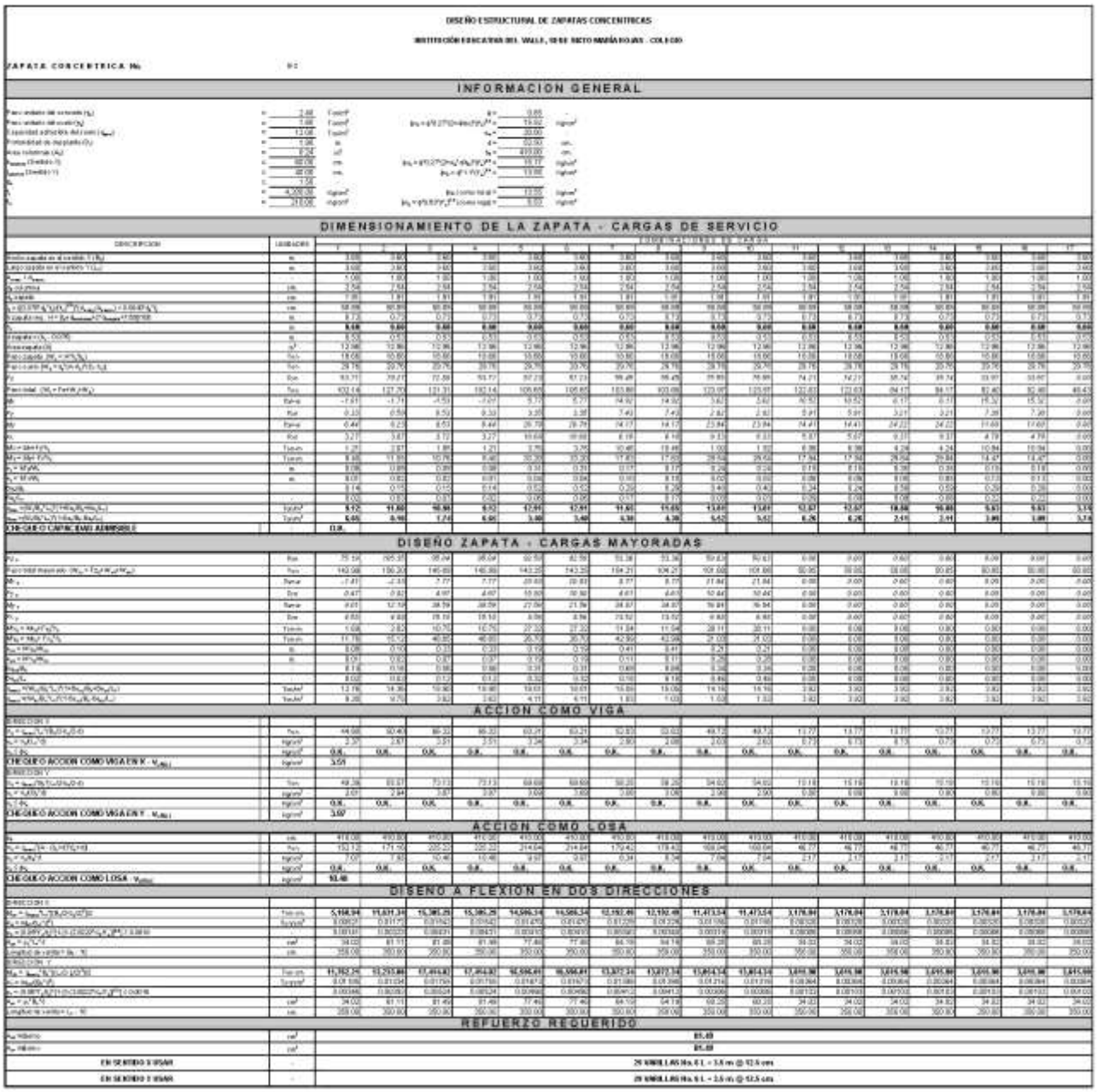
DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INSTITUCIÓN EDUCATIVA DEL VALLE, SEDE SIXTO MARÍA ROJAS - COLEGIO

ZAPATA CONCENTRICA No. 01

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

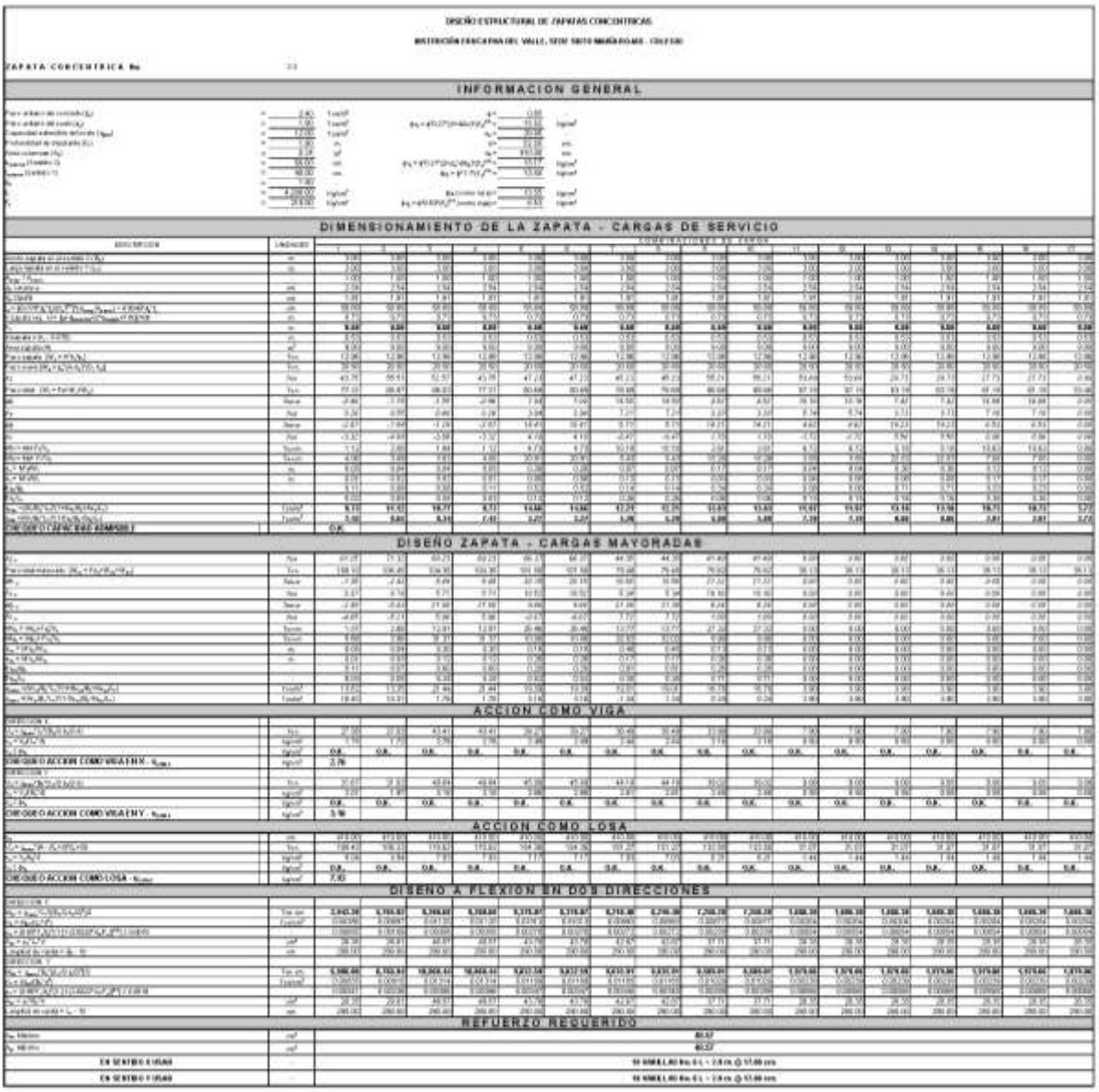
DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INSTITUCIÓN EDUCATIVA DEL VALLE, SEDE SIXTO MARÍA ROJAS - (BLOQUE A)

ZAPATA CONCENTRICA No. 33

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

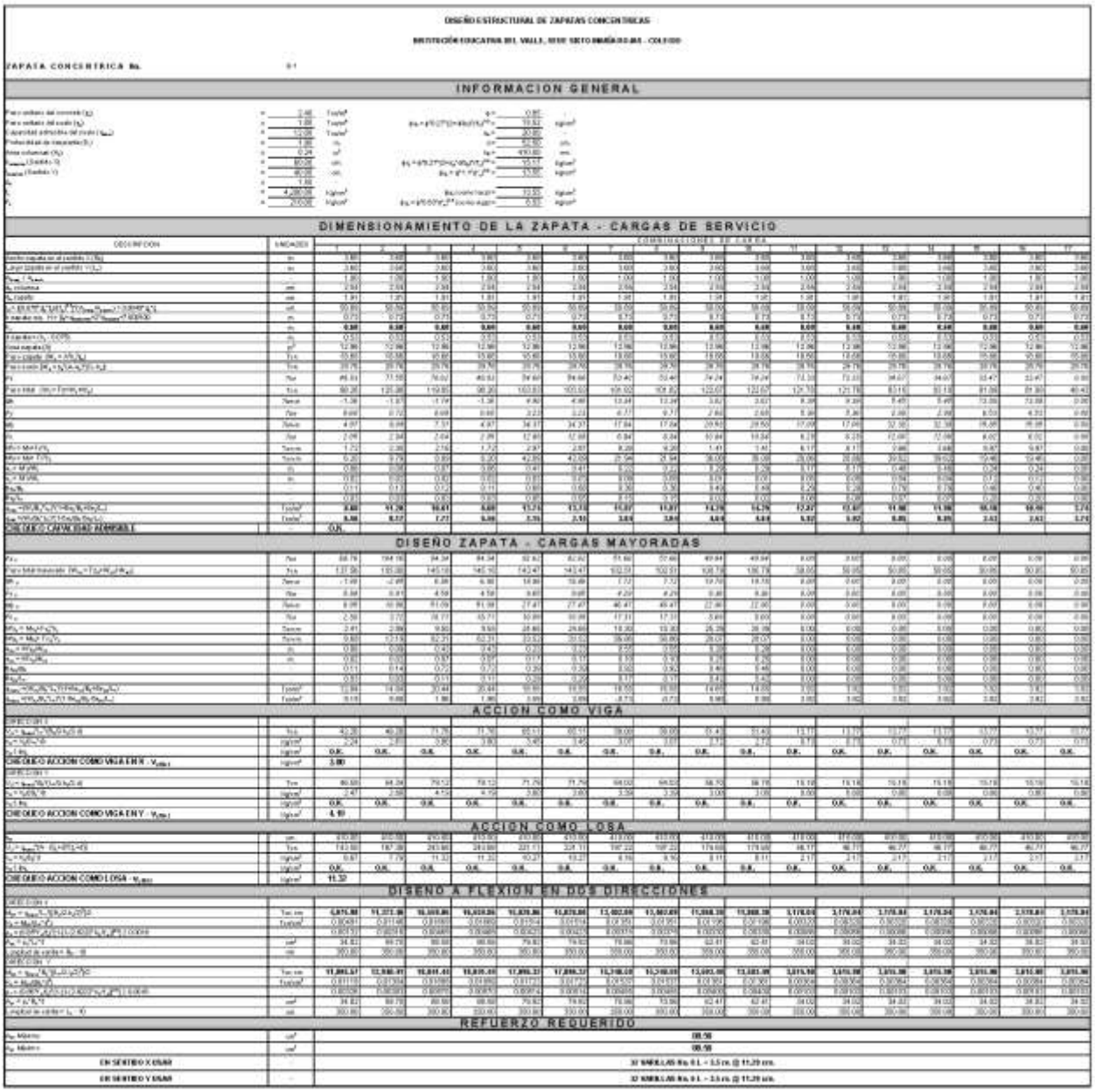
DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

ZAPATA CONCENTRICA No. 01

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

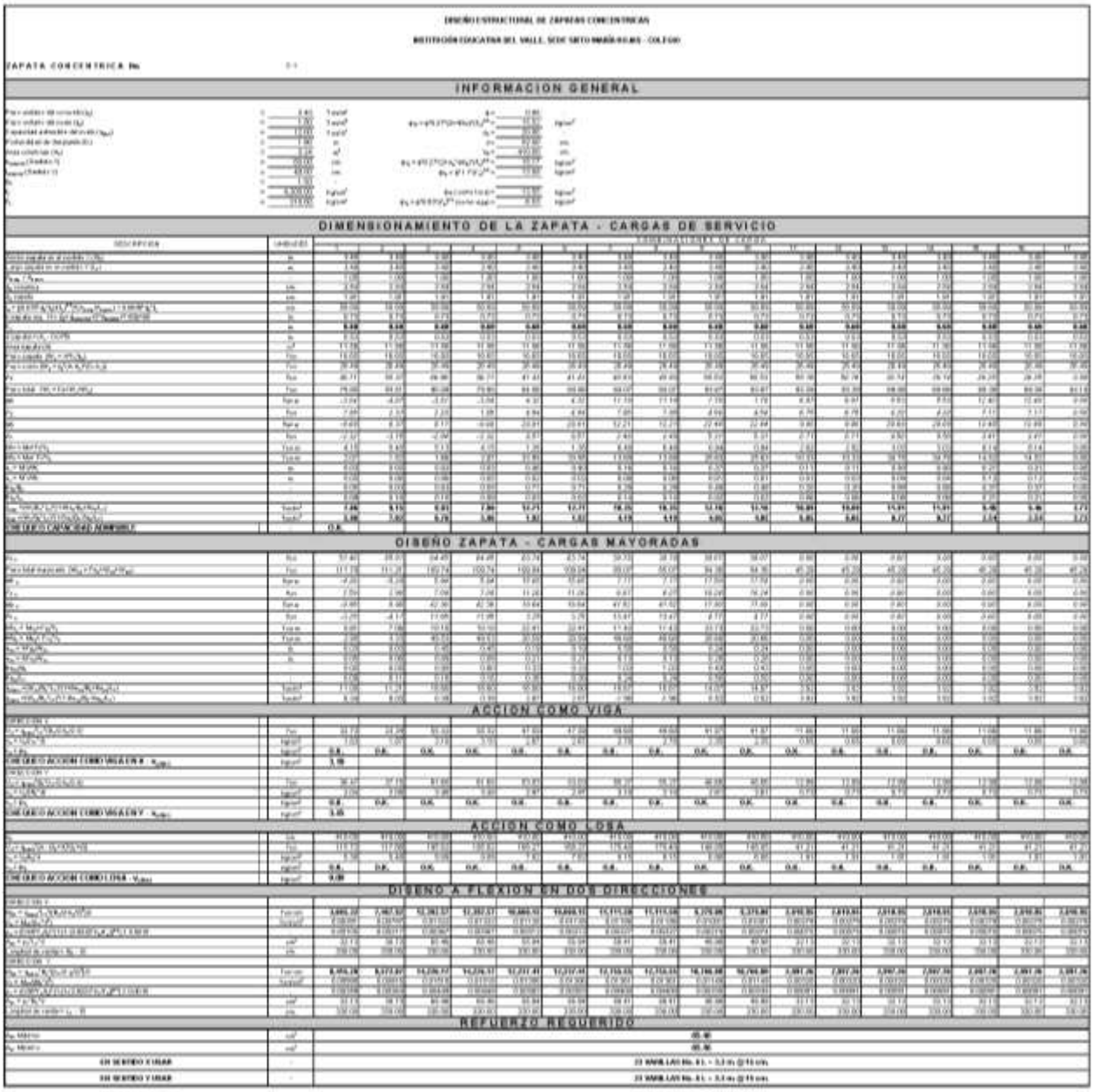
DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO

7.4 DESPIECES

7.4.1 DESPIECE DE VIGAS

V-101/PISO1

B=0.50 H=0.45 L=2.35			B=0.50 H=0.45 L=8.90			B=0.50 H=0.45 L=0.80		
Mu=-0.00 As =30.54 As(r)=6.53		Mu=-147.73 As =30.54 As(r)=10.53	Mu=-382.87 As =30.54 As(r)=33.62		Mu=-306.65 As =21.78 As(r)=23.87	Mu=-31.10 As =21.78 As(r)=6.53		Mu=-0.00 As =21.78 As(r)=6.53
	Mu=0.00 As =16.11 As(r)=6.53			Mu=197.23 As =16.71 As(r)=14.41			Mu=0.00 As =16.11 As(r)=6.53	
Vu=35.13	Vu=55.44	Vu=75.75	Vu=-185.18	Vu=-18.62	Vu=171.26	Vu=-38.27	Vu=-32.20	Vu=-26.14

V-101A/PISO1

B=0.20 H=0.45 L=2.40			B=0.20 H=0.45 L=9.00			B=0.20 H=0.45 L=0.85		
Mu=-5.76 As =10.14 As(r)=2.61		Mu=-82.50 As =10.14 As(r)=6.06	Mu=-119.47 As =10.14 As(r)=9.25		Mu=-71.54 As =5.70 As(r)=5.18	Mu=-20.92 As =5.70 As(r)=2.61		Mu=-5.77 As =5.70 As(r)=2.61
	Mu=0.00 As =3.96 As(r)=2.61			Mu=87.82 As =8.64 As(r)=6.49			Mu=0.62 As =3.96 As(r)=2.61	
Vu=5.31	Vu=28.06	Vu=54.43	Vu=-86.04	Vu=-12.70	Vu=69.27	Vu=-18.51	Vu=-13.68	Vu=-8.85

V-101B/PISO1

B=0.20 H=0.45 L=2.40			B=0.20 H=0.45 L=9.00			B=0.20 H=0.45 L=0.85		
Mu=-6.99 As =10.14 As(r)=2.61		Mu=-97.12 As =10.14 As(r)=7.27	Mu=-143.77 As =10.14 As(r)=11.61		Mu=-84.27 As =5.70 As(r)=6.20	Mu=-17.62 As =5.70 As(r)=2.61		Mu=-9.00 As =5.70 As(r)=2.61
	Mu=0.00 As =3.96 As(r)=2.61			Mu=106.21 As =8.64 As(r)=8.06			Mu=4.41 As =3.96 As(r)=2.61	
Vu=9.01	Vu=32.81	Vu=59.21	Vu=-99.36	Vu=-11.24	Vu=80.09	Vu=-13.78	Vu=-8.95	Vu=7.42

V-102/PISO1

B=0.50 H=0.45 L=2.35			B=0.50 H=0.45 L=8.90			B=0.50 H=0.45 L=0.80		
Mu=-0.00 As =30.54 As(r)=6.53		Mu=-316.57 As =30.54 As(r)=24.80	Mu=-710.11 As =30.54 As(r)=999.99		Mu=-612.46 As =21.78 As(r)=47.91	Mu=-89.41 As =21.78 As(r)=6.53		Mu=-0.00 As =21.78 As(r)=6.53
	Mu=0.00 As =16.11 As(r)=6.53			Mu=361.22 As =16.71 As(r)=29.20			Mu=0.00 As =16.11 As(r)=6.53	
Vu=89.44	Vu=121.19	Vu=152.93	Vu=-361.18	Vu=16.50	Vu=368.42	Vu=-95.84	Vu=-87.60	Vu=-79.36

V-102A/PISO1

B=0.20 H=0.45 L=2.40			B=0.20 H=0.45 L=9.00			B=0.20 H=0.45 L=0.85		
Mu=-8.01 As =10.14 As(r)=2.61		Mu=-103.17 As =10.14 As(r)=7.80	Mu=-150.95 As =10.14 As(r)=13.31		Mu=-84.74 As =5.70 As(r)=6.24	Mu=-21.57 As =5.70 As(r)=2.61		Mu=-8.29 As =5.70 As(r)=2.61
	Mu=0.00 As =3.96 As(r)=2.61			Mu=117.76 As =8.94 As(r)=9.10			Mu=0.07 As =3.96 As(r)=2.61	
Vu=10.52	Vu=34.64	Vu=61.01	Vu=-101.24	Vu=-11.93	Vu=78.19	Vu=-17.78	Vu=-12.95	Vu=-8.12

V-102B/PISO1

B=0.20 H=0.45 L=2.40			B=0.20 H=0.45 L=9.00			B=0.20 H=0.45 L=0.85		
Mu=-9.05 As =10.14 As(r)=2.61		Mu=-94.07 As =10.14 As(r)=7.02	Mu=-139.22 As =10.14 As(r)=11.15		Mu=-76.60 As =5.70 As(r)=5.58	Mu=-15.21 As =5.70 As(r)=2.61		Mu=-8.67 As =5.70 As(r)=2.61
	Mu=0.00 As =3.96 As(r)=2.61			Mu=114.28 As =8.94 As(r)=8.78			Mu=3.80 As =3.96 As(r)=2.61	
Vu=6.89	Vu=30.92	Vu=57.31	Vu=-96.84	Vu=-13.06	Vu=75.04	Vu=-12.02	Vu=-7.19	Vu=9.08

V-103/PISO1

B=0.50 H=0.45 L=2.35			B=0.50 H=0.45 L=8.90			B=0.50 H=0.45 L=0.80		
Mu=-0.00 As =30.54 As(r)=6.53		Mu=-297.41 As =30.54 As(r)=23.02	Mu=-696.63 As =30.54 As(r)=999.99		Mu=-596.08 As =21.78 As(r)=46.89	Mu=-85.63 As =21.78 As(r)=6.53		Mu=-0.00 As =21.78 As(r)=6.53
	Mu=0.00 As =16.31 As(r)=6.53			Mu=356.18 As =16.71 As(r)=28.68			Mu=0.00 As =16.31 As(r)=6.53	
Vu=82.23	Vu=113.97	Vu=145.72	Vu=-353.85	Vu=18.71	Vu=360.21	Vu=-92.90	Vu=-84.66	Vu=-76.42

V-103A/PISO1

B=0.20 H=0.45 L=2.40			B=0.20 H=0.45 L=9.00			B=0.20 H=0.45 L=0.85		
Mu=-7.69 As =10.14 As(r)=2.61		Mu=-101.57 As =10.14 As(r)=7.66	Mu=-152.73 As =10.14 As(r)=13.42		Mu=-92.11 As =5.70 As(r)=6.85	Mu=-23.29 As =5.70 As(r)=2.61		Mu=-8.08 As =5.70 As(r)=2.61
	Mu=0.00 As =3.96 As(r)=2.61			Mu=113.06 As =8.94 As(r)=8.67			Mu=0.85 As =3.96 As(r)=2.61	
Vu=11.32	Vu=34.25	Vu=60.62	Vu=-101.99	Vu=-13.74	Vu=79.91	Vu=-19.15	Vu=-14.32	Vu=-9.49

V-103B/PISO1

B=0.20 H=0.45 L=2.40			B=0.20 H=0.45 L=9.00			B=0.20 H=0.45 L=0.85		
Mu=-9.69 As =10.14 As(r)=2.61		Mu=-88.92 As =10.14 As(r)=6.58	Mu=-135.49 As =10.14 As(r)=10.78		Mu=-77.36 As =5.70 As(r)=5.64	Mu=-15.05 As =5.70 As(r)=2.61		Mu=-7.65 As =5.70 As(r)=2.61
	Mu=0.00 As =3.96 As(r)=2.61			Mu=99.97 As =8.94 As(r)=7.52			Mu=1.16 As =3.96 As(r)=2.61	
Vu=5.81	Vu=28.81	Vu=55.21	Vu=-94.81	Vu=-21.80	Vu=72.72	Vu=-11.99	Vu=-7.17	Vu=7.84

V-104/PISO1

B=0.50 H=0.45 L=2.35			B=0.50 H=0.45 L=8.90			B=0.50 H=0.45 L=0.80		
Mu=-0.00 As =30.54 As(r)=6.53		Mu=-286.02 As =30.54 As(r)=21.98	Mu=-572.60 As =30.54 As(r)=45.43		Mu=-476.54 As =21.78 As(r)=39.45	Mu=-68.02 As =21.78 As(r)=6.53		Mu=-0.00 As =21.78 As(r)=6.53
	Mu=0.00 As =16.31 As(r)=6.53			Mu=256.39 As =16.71 As(r)=19.35			Mu=1.82 As =16.31 As(r)=6.53	
Vu=77.99	Vu=108.79	Vu=139.59	Vu=-276.96	Vu=-26.47	Vu=262.06	Vu=-69.66	Vu=-62.50	Vu=-55.34

V-105/PISO1

B=0.20 H=0.45 L=2.40			B=0.20 H=0.45 L=9.00			B=0.20 H=0.45 L=0.85		
Mu=-1.36 As =10.14 As(r)=2.61		Mu=-87.18 As =10.14 As(r)=6.44	Mu=-115.73 As =10.14 As(r)=8.91		Mu=-66.36 As =5.70 As(r)=4.77	Mu=-17.12 As =5.70 As(r)=2.61		Mu=-5.15 As =5.70 As(r)=2.61
	Mu=0.00 As =3.96 As(r)=2.61			Mu=72.86 As =8.94 As(r)=5.28			Mu=3.65 As =3.96 As(r)=2.61	
Vu=11.36	Vu=31.83	Vu=56.20	Vu=-51.28	Vu=-16.34	Vu=37.43	Vu=-13.33	Vu=-10.14	Vu=8.09

V-106/PISO1

B=0.20 H=0.45 L=2.40		
Mu=-6.27 As =3.25 As(r)=2.61		Mu=-25.07 As =3.25 As(r)=2.61
	Mu=6.27 As =3.25 As(r)=2.61	
Vu=-6.49	Vu=7.41	Vu=21.31

V-107/PISO1

B=0.20 H=0.45 L=1.70			B=0.20 H=0.45 L=1.60			B=0.20 H=0.45 L=2.91		
Mu=-2.83 As =5.70 As(r)=2.61		Mu=-30.01 As =5.70 As(r)=2.61	Mu=-33.22 As =5.70 As(r)=2.61		Mu=-78.32 As =5.70 As(r)=5.72	Mu=-78.44 As =5.70 As(r)=5.73		Mu=-19.61 As =3.96 As(r)=2.61
	Mu=0.00 As =3.96 As(r)=2.61			Mu=19.58 As =3.96 As(r)=2.61			Mu=19.61 As =3.96 As(r)=2.61	
Vu=6.49	Vu=14.41	Vu=22.33	Vu=17.16	Vu=24.01	Vu=31.40	Vu=-46.59	Vu=-26.69	Vu=-10.38

B=0.20 H=0.45 L=2.42			B=0.20 H=0.45 L=2.27			B=0.20 H=0.45 L=2.91		
Mu=-8.12 As =3.96 As(r)=2.61		Mu=-8.12 As =3.96 As(r)=2.61	Mu=-14.22 As =3.96 As(r)=2.61		Mu=-56.87 As =3.96 As(r)=4.04	Mu=-62.10 As =3.96 As(r)=4.44		Mu=-15.53 As =3.96 As(r)=2.61
	Mu=31.90 As =3.96 As(r)=2.61			Mu=14.22 As =3.96 As(r)=2.61			Mu=15.53 As =3.96 As(r)=2.61	
Vu=-13.58	Vu=9.22	Vu=20.41	Vu=10.89	Vu=24.21	Vu=37.98	Vu=-44.26	Vu=-24.37	Vu=-6.55

B=0.20 H=0.45 L=2.42			B=0.20 H=0.45 L=2.27			B=0.20 H=0.45 L=2.91		
Mu=-7.21 As =3.96 As(r)=2.61		Mu=-7.21 As =5.70 As(r)=2.61	Mu=-14.98 As =5.70 As(r)=2.61		Mu=-59.93 As =5.70 As(r)=4.27	Mu=-74.62 As =5.70 As(r)=5.42		Mu=-18.65 As =3.96 As(r)=2.61
	Mu=28.19 As =3.96 As(r)=2.61			Mu=14.98 As =3.96 As(r)=2.61			Mu=18.65 As =3.96 As(r)=2.61	
Vu=-11.51	Vu=7.91	Vu=19.10	Vu=10.42	Vu=24.05	Vu=37.82	Vu=-51.63	Vu=-31.74	Vu=-12.35

B=0.20 H=0.45 L=2.42			B=0.20 H=0.45 L=2.27		
Mu=-13.10 As =3.96 As(r)=2.61		Mu=-13.10 As =3.96 As(r)=2.61	Mu=-11.17 As =3.96 As(r)=2.61		Mu=-31.22 As =3.96 As(r)=2.61
	Mu=51.81 As =3.96 As(r)=3.70			Mu=35.07 As =3.96 As(r)=2.66	
Vu=-20.55	Vu=-9.35	Vu=13.31	Vu=9.07	Vu=21.36	Vu=35.13

V-108/PISO1

B=0.50 H=0.45 L=1.70			B=0.50 H=0.45 L=1.60			B=0.50 H=0.45 L=2.91		
Mu=-0.00 As =7.77 As(r)=6.53		Mu=-59.92 As =16.10 As(r)=6.53	Mu=-93.19 As =22.15 As(r)=6.53		Mu=-372.76 As =39.18 As(r)=31.64	Mu=-441.22 As =39.18 As(r)=37.25		Mu=-110.30 As =7.77 As(r)=7.72
	Mu=0.00 As =6.81 As(r)=6.53			Mu=93.19 As =6.81 As(r)=6.53			Mu=110.30 As =6.81 As(r)=7.72	
Vu=21.31	Vu=32.92	Vu=44.53	Vu=152.01	Vu=169.82	Vu=187.63	Vu=-244.71	Vu=-202.42	Vu=-160.13

B=0.50 H=0.45 L=2.42			B=0.50 H=0.45 L=2.27			B=0.50 H=0.45 L=2.91		
Mu=-57.50 As =7.77 As(r)=6.53		Mu=-57.50 As =12.73 As(r)=6.53	Mu=-112.74 As =18.78 As(r)=7.90		Mu=-450.96 As =39.18 As(r)=37.86	Mu=-447.11 As =39.18 As(r)=37.62		Mu=-111.78 As =8.49 As(r)=7.83
	Mu=224.64 As =6.81 As(r)=16.97			Mu=112.74 As =6.81 As(r)=7.90			Mu=111.78 As =6.81 As(r)=7.83	
Vu=-27.99	Vu=33.65	Vu=57.74	Vu=210.98	Vu=240.21	Vu=269.45	Vu=-249.27	Vu=-206.98	Vu=-164.69

B=0.50 H=0.45 L=2.42			B=0.50 H=0.45 L=2.27			B=0.50 H=0.45 L=2.91		
Mu=-55.52 As =6.48 As(r)=6.53		Mu=-55.52 As =13.76 As(r)=6.53	Mu=-111.41 As =20.09 As(r)=7.80		Mu=-445.63 As =41.58 As(r)=37.53	Mu=-485.80 As =43.56 As(r)=40.03		Mu=-121.45 As =9.72 As(r)=8.55
	Mu=216.95 As =6.81 As(r)=16.32			Mu=111.41 As =6.81 As(r)=7.80			Mu=121.45 As =11.55 As(r)=8.55	
Vu=-25.11	Vu=30.76	Vu=54.85	Vu=210.18	Vu=239.42	Vu=268.65	Vu=-266.82	Vu=-224.53	Vu=-182.24

B=0.50 H=0.45 L=2.42			B=0.50 H=0.45 L=2.27		
Mu=-62.67 As =9.75 As(r)=6.53		Mu=-62.67 As =7.77 As(r)=6.53	Mu=-88.22 As =7.77 As(r)=6.53		Mu=-352.89 As =40.42 As(r)=28.35
	Mu=250.48 As =10.25 As(r)=18.86			Mu=88.22 As =11.55 As(r)=6.53	
Vu=-38.48	Vu=23.08	Vu=47.17	Vu=175.27	Vu=204.50	Vu=233.74

V-108A/PISO1

B=0.20 H=0.45 L=1.80			B=0.20 H=0.45 L=3.16			B=0.20 H=0.45 L=2.52		
Mu=-14.77 As =2.54 As(r)=2.61		Mu=-62.02 As =10.14 As(r)=4.44	Mu=-120.64 As =10.14 As(r)=9.36		Mu=-30.16 As =3.96 As(r)=2.61	Mu=-30.71 As =3.96 As(r)=2.61		Mu=-30.71 As =3.96 As(r)=2.61
	Mu=0.00 As =7.76 As(r)=2.61			Mu=55.84 As =7.76 As(r)=5.16			Mu=116.21 As =7.76 As(r)=9.34	
Vu=10.32	Vu=25.28	Vu=41.46	Vu=-113.89	Vu=-71.37	Vu=-28.85	Vu=-14.93	Vu=23.65	Vu=50.16

B=0.20 H=0.45 L=2.52			B=0.20 H=0.45 L=3.16			B=0.20 H=0.45 L=2.52		
Mu=-42.52 As =3.96 As(r)=2.97		Mu=-170.07 As =14.46 As(r)=14.50	Mu=-177.47 As =14.46 As(r)=14.96		Mu=-44.37 As =3.96 As(r)=3.11	Mu=-20.61 As =3.96 As(r)=2.61		Mu=-20.61 As =3.96 As(r)=2.61
	Mu=42.52 As =7.76 As(r)=2.97			Mu=44.37 As =7.76 As(r)=3.11			Mu=80.33 As =7.76 As(r)=6.05	
Vu=58.30	Vu=87.53	Vu=116.77	Vu=-118.20	Vu=-75.69	Vu=-33.17	Vu=-18.11	Vu=14.23	Vu=41.96

B=0.20 H=0.45 L=2.52			B=0.20 H=0.45 L=3.16			B=0.20 H=0.45 L=2.52		
Mu=-43.61 As =3.96 As(r)=3.05		Mu=-174.43 As =15.84 As(r)=14.77	Mu=-183.90 As =16.84 As(r)=15.36		Mu=-45.97 As =3.96 As(r)=3.23	Mu=-39.28 As =3.96 As(r)=2.74		Mu=-39.28 As =3.96 As(r)=2.74
	Mu=43.61 As =7.76 As(r)=3.05			Mu=45.97 As =7.76 As(r)=3.23			Mu=156.43 As =7.76 As(r)=13.70	
Vu=50.58	Vu=79.82	Vu=109.06	Vu=-134.67	Vu=-92.15	Vu=-49.63	Vu=-36.62	Vu=-12.51	Vu=24.60

B=0.20 H=0.45 L=2.47		
Mu=-35.83 As =3.96 As(r)=2.61		Mu=-65.75 As =7.97 As(r)=4.72
	Mu=71.80 As =7.76 As(r)=6.38	
Vu=47.16	Vu=76.39	Vu=105.63

V-108B/PISO1

B=0.20 H=0.45 L=1.80			B=0.20 H=0.45 L=3.16			B=0.20 H=0.45 L=2.52		
Mu=-7.18 As =2.54 As(r)=2.61		Mu=-62.45 As =10.14 As(r)=4.47	Mu=-116.19 As =10.14 As(r)=8.95		Mu=-29.15 As =3.96 As(r)=2.61	Mu=-30.11 As =3.96 As(r)=2.61		Mu=-30.11 As =3.96 As(r)=2.61
	Mu=0.41 As =7.76 As(r)=2.61			Mu=60.73 As =7.76 As(r)=5.49			Mu=114.31 As =7.76 As(r)=9.15	
Vu=13.67	Vu=28.63	Vu=43.59	Vu=-109.90	Vu=-67.55	Vu=-26.61	Vu=-16.28	Vu=24.37	Vu=49.54

B=0.20 H=0.45 L=2.52			B=0.20 H=0.45 L=3.16			B=0.20 H=0.45 L=2.52		
Mu=-43.62 As =3.96 As(r)=3.05		Mu=-174.46 As =14.48 As(r)=14.78	Mu=-180.53 As =14.48 As(r)=15.15		Mu=-45.13 As =3.96 As(r)=3.16	Mu=-20.48 As =3.96 As(r)=2.61		Mu=-20.48 As =3.96 As(r)=2.61
	Mu=43.62 As =7.76 As(r)=3.05			Mu=45.13 As =7.76 As(r)=3.16			Mu=80.29 As =7.76 As(r)=6.01	
Vu=60.56	Vu=89.79	Vu=119.03	Vu=-118.79	Vu=-76.43	Vu=-34.08	Vu=-20.43	Vu=13.87	Vu=40.20

B=0.20 H=0.45 L=2.52			B=0.20 H=0.45 L=3.16			B=0.20 H=0.45 L=2.52		
Mu=-44.10 As =3.96 As(r)=3.09		Mu=-176.40 As =16.84 As(r)=14.90	Mu=-184.90 As =16.84 As(r)=15.43		Mu=-46.23 As =3.96 As(r)=3.24	Mu=-37.09 As =3.96 As(r)=2.61		Mu=-37.09 As =3.96 As(r)=2.61
	Mu=44.10 As =7.76 As(r)=3.09			Mu=46.23 As =7.76 As(r)=3.24			Mu=147.74 As =7.76 As(r)=12.08	
Vu=53.20	Vu=82.43	Vu=111.67	Vu=-132.93	Vu=-90.58	Vu=-48.23	Vu=-37.45	Vu=-13.36	Vu=25.88

B=0.20 H=0.45 L=2.47		
Mu=-33.71 As =3.96 As(r)=2.61		Mu=-65.81 As =7.97 As(r)=4.73
	Mu=71.51 As =7.76 As(r)=6.27	
Vu=42.56	Vu=71.80	Vu=101.03

V-109/PISO1

B=0.50 H=0.45 L=1.60			B=0.50 H=0.45 L=2.91			B=0.50 H=0.45 L=2.42		
Mu=-0.00 As =19.40 As(r)=6.53		Mu=-113.95 As =18.90 As(r)=7.99	Mu=-298.04 As =14.98 As(r)=23.07		Mu=-74.51 As =6.53 As(r)=6.53	Mu=-40.20 As =6.35 As(r)=6.53		Mu=-40.20 As =6.35 As(r)=6.53
	Mu=0.00 As =9.51 As(r)=6.53			Mu=74.51 As =9.51 As(r)=6.53			Mu=156.42 As =9.51 As(r)=11.43	
Vu=49.84	Vu=64.16	Vu=78.48	Vu=-163.81	Vu=-127.71	Vu=-96.74	Vu=-24.25	Vu=27.35	Vu=49.14

B=0.50 H=0.45 L=2.27			B=0.50 H=0.45 L=2.91			B=0.50 H=0.45 L=2.42		
Mu=-81.61 As =6.15 As(r)=6.53		Mu=-334.42 As =18.51 As(r)=26.52	Mu=-321.23 As =19.40 As(r)=25.44		Mu=-80.81 As =13.40 As(r)=6.53	Mu=-34.87 As =11.64 As(r)=6.53		Mu=-34.87 As =14.38 As(r)=6.53
	Mu=83.61 As =9.51 As(r)=6.53			Mu=80.81 As =9.51 As(r)=6.53			Mu=138.01 As =9.51 As(r)=9.90	
Vu=138.49	Vu=161.62	Vu=187.81	Vu=-171.54	Vu=-135.44	Vu=-101.10	Vu=-25.85	Vu=19.26	Vu=41.05

B=0.50 H=0.45 L=2.27			B=0.50 H=0.45 L=2.91			B=0.50 H=0.45 L=2.42		
Mu=-78.19 As =17.21 As(r)=6.53		Mu=-312.75 As =23.28 As(r)=24.44	Mu=-360.00 As =23.28 As(r)=29.07		Mu=-90.00 As =7.77 As(r)=6.53	Mu=-43.00 As =7.77 As(r)=6.53		Mu=-43.00 As =7.77 As(r)=6.53
	Mu=78.19 As =9.51 As(r)=6.53			Mu=90.00 As =10.46 As(r)=6.53			Mu=172.00 As =9.51 As(r)=12.41	
Vu=126.68	Vu=152.51	Vu=178.70	Vu=-188.24	Vu=-152.14	Vu=-118.54	Vu=-36.69	Vu=-14.89	Vu=36.41

B=0.50 H=0.45 L=2.27		
Mu=-65.10 As =7.77 As(r)=6.53		Mu=-260.38 As =7.77 As(r)=19.70
	Mu=65.10 As =10.46 As(r)=6.53	
Vu=115.86	Vu=137.65	Vu=161.91

V-110/PISO1

B=0.20 H=0.45 L=1.60			B=0.20 H=0.45 L=2.91			B=0.20 H=0.45 L=2.42		
Mu=-6.54 As =3.96 As(r)=2.61		Mu=-29.31 As =3.96 As(r)=2.61	Mu=-59.04 As =3.96 As(r)=4.21		Mu=-14.76 As =3.96 As(r)=2.61	Mu=-10.27 As =3.96 As(r)=2.61		Mu=-10.27 As =3.96 As(r)=2.61
	Mu=1.06 As =3.96 As(r)=2.61			Mu=25.64 As =3.96 As(r)=2.61			Mu=36.34 As =3.96 As(r)=2.63	
Vu=8.09	Vu=14.30	Vu=20.51	Vu=-34.98	Vu=-23.36	Vu=-11.88	Vu=-11.59	Vu=14.02	Vu=22.93

B=0.20 H=0.45 L=2.27			B=0.20 H=0.45 L=2.91			B=0.20 H=0.45 L=2.42		
Mu=-15.73 As =3.96 As(r)=2.61		Mu=-62.92 As =3.96 As(r)=4.50	Mu=-66.59 As =3.96 As(r)=4.79		Mu=-16.65 As =3.96 As(r)=2.61	Mu=-7.35 As =3.96 As(r)=2.61		Mu=-7.35 As =3.96 As(r)=2.61
	Mu=15.73 As =3.96 As(r)=2.61			Mu=16.65 As =3.96 As(r)=2.61			Mu=28.78 As =3.96 As(r)=2.61	
Vu=16.53	Vu=26.54	Vu=37.26	Vu=-39.16	Vu=-25.28	Vu=-12.89	Vu=-12.94	Vu=9.91	Vu=18.81

B=0.20 H=0.45 L=2.27			B=0.20 H=0.45 L=2.91			B=0.20 H=0.45 L=2.42		
Mu=-14.44 As =3.96 As(r)=2.61		Mu=-57.76 As =3.96 As(r)=4.11	Mu=-78.42 As =3.96 As(r)=5.73		Mu=-19.60 As =3.96 As(r)=2.61	Mu=-12.01 As =3.96 As(r)=2.61		Mu=-12.01 As =3.96 As(r)=2.61
	Mu=14.44 As =3.96 As(r)=2.61			Mu=19.60 As =3.96 As(r)=2.61			Mu=43.14 As =3.96 As(r)=3.06	
Vu=14.10	Vu=24.34	Vu=35.06	Vu=-44.29	Vu=-30.42	Vu=-16.95	Vu=-20.32	Vu=-11.42	Vu=14.49

B=0.20 H=0.45 L=2.27		
Mu=-10.43 As =3.96 As(r)=2.61		Mu=-30.69 As =3.96 As(r)=2.61
	Mu=34.49 As =3.96 As(r)=2.61	
Vu=7.13	Vu=16.03	Vu=26.14

V-201/PISO2

B=0.30 H=0.45 L=8.90		
Mu=-167.42 As =11.47 As(r)=12.81		Mu=-77.60 As =8.55 As(r)=5.48
	Mu=60.21 As =5.94 As(r)=4.20	
Vu=-63.10	Vu=-32.32	Vu=38.97

V-202/PISO2

B=0.30 H=0.45 L=8.90		
Mu=-201.83 As =11.47 As(r)=16.03		Mu=-104.15 As =8.55 As(r)=7.52
	Mu=88.76 As =5.94 As(r)=6.33	
Vu=-75.27	Vu=-44.49	Vu=48.58

V-203/PISO2

B=0.30 H=0.45 L=8.90		
Mu=-215.30 As =11.47 As(r)=17.37		Mu=-110.67 As =8.55 As(r)=8.03
	Mu=87.69 As =5.94 As(r)=6.24	
Vu=-78.44	Vu=-47.66	Vu=49.73

V-204/PISO2

B=0.30 H=0.45 L=8.90		
Mu=-216.48 As =13.47 As(r)=17.49		Mu=-104.39 As =8.58 As(r)=7.54
	Mu=72.85 As =5.94 As(r)=5.13	
Vu=-76.30	Vu=-45.52	Vu=45.89

V-205/PISO2

B=0.30 H=0.45 L=8.10			B=0.30 H=0.45 L=8.10			B=0.30 H=0.45 L=8.10		
Mu=-102.43 As =6.81 As(r)=7.38		Mu=-64.33 As =5.94 As(r)=4.50	Mu=-90.84 As =5.94 As(r)=6.49		Mu=-61.20 As =5.94 As(r)=4.27	Mu=-89.08 As =5.94 As(r)=6.35		Mu=-81.44 As =5.94 As(r)=5.77
	Mu=25.61 As =4.52 As(r)=3.92			Mu=23.20 As =4.52 As(r)=3.92			Mu=22.33 As =4.52 As(r)=3.92	
Vu=-41.63	Vu=-14.09	Vu=33.34	Vu=-40.02	Vu=-12.48	Vu=33.07	Vu=-38.95	Vu=-11.41	Vu=36.33

V-206/PISO2

B=0.30 H=0.45 L=8.00			B=0.30 H=0.45 L=8.00			B=0.30 H=0.45 L=8.05		
Mu=-114.31 As =6.81 As(r)=8.32		Mu=-59.30 As =5.94 As(r)=4.13	Mu=-86.25 As =5.94 As(r)=6.13		Mu=-61.25 As =5.94 As(r)=4.27	Mu=-91.29 As =5.94 As(r)=6.52		Mu=-70.22 As =5.94 As(r)=4.93
	Mu=28.58 As =4.52 As(r)=3.92			Mu=23.86 As =4.52 As(r)=3.92			Mu=23.74 As =4.52 As(r)=3.92	
Vu=-43.41	Vu=-15.87	Vu=30.57	Vu=-39.07	Vu=-11.53	Vu=33.21	Vu=-39.97	Vu=-12.43	Vu=34.26

7.4.2 DESPIECE DE VIGAS

Columnas B-4, C-1

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
PISO2	3.05	.45	.40	.60	17.47	-96.44	-179.43	75.15	73.41	18/#6 (2.1%)	0.33	3.03	4.16
					155.38	187.78				18/#6 (2.1%)	0.74		
PISO1	3.55	.45	.40	.60	50.35	-284.75	-643.73	118.34	136.15	18/#6 (2.1%)	0.98	1.93	2.03
		1.00			57.64	226.33				18/#6 (2.1%)	0.80		

Columnas C-4, C-2

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
PISO2	3.05	.45	.40	.60	-44.20	-85.02	-141.20	58.07	59.29	16/#6 (1.9%)	0.33	4.15	3.73
					141.01	135.86				16/#6 (1.9%)	0.59		
PISO1	3.55	.45	.40	.60	191.31	-244.58	-513.29	108.15	119.53	16/#6 (1.9%)	1.00	1.93	5.26
		1.00			116.88	233.58				16/#6 (1.9%)	0.91		

Columna B-3

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
PISO2	3.05	.45	.40	.60	79.01	99.91	-222.85	99.90	51.82	16/#7 (2.6%)	0.35	3.62	2.73
					253.37	-34.79				16/#7 (2.6%)	0.48		
PISO1	3.55	.45	.40	.60	215.17	194.54	-1081.55	152.26	109.86	16/#7 (2.6%)	0.78	1.98	1.92
		1.00			221.40	-244.93				16/#7 (2.6%)	0.95		

Columna C-3

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
PISO2					-22.93	105.89				16/#6 #5 (1.6%)	0.44	3.67	1.86
	3.05	.45	.40	.60			-173.66	103.31	56.24				
					301.26	-45.67				16/#6 #5 (1.6%)	0.83		
PISO1					241.29	196.44				16/#6 #5 (1.6%)	0.96	1.82	1.41
	3.55	.45	.40	.60			-864.78	158.55	109.68				
		1.00			-4.10	-242.27				16/#6 #5 (1.6%)	0.92		

Columna B-2

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
PISO2					88.34	99.34				16/#7 #6 (2.2%)	0.38	3.23	2.41
	3.05	.45	.40	.60			-219.63	107.53	46.97				
					261.71	-14.11				16/#7 #6 (2.2%)	0.54		
PISO1					227.56	175.97				16/#7 #6 (2.2%)	0.79	1.82	1.92
	3.55	.45	.40	.60			-1049.50	175.32	102.95				
		1.00			244.52	-235.84				16/#7 #6 (2.2%)	1.00		

Columna B-1

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
PISO2					170.05	46.12				16/#8 #7 (3.0%)	0.32	3.97	4.57
	3.05	.45	.40	.60			-217.13	97.88	34.35				
					178.40	-51.51				16/#8 #7 (3.0%)	0.34		
PISO1					175.83	173.80				16/#8 #7 (3.0%)	0.62	2.23	1.22
	3.55	.45	.40	.60			-905.05	184.55	102.13				
		1.00			469.38	-114.00				16/#8 #7 (3.0%)	0.96		

7.5 DISEÑO DE ELEMENTOS COMPLEMENTARIOS

DISEÑO DE ELEMENTOS METÁLICOS
AISC360-10
I.E SIXTO MARÍA ROJAS

1 Design Data

This chapter provides design data and results.

1.1 Steel Frame Design

Table 1.1 - Steel Frame Preferences - AISC 360-10

Item	Value
Multi-Response Design	Step-by-Step
Frame Type	OMF
Seismic Design Grade	D
Importance Factor	1
Design System Rho	0
Design System Sds	1
Design System R	8
Design System Omega0	3
Design System Cd	5.5
Design Provision	LRFD
Analysis Method	Direct Analysis
Second Order Method	General 2nd Order
Stiffness Reduction Method	Tau-b Fixed
Phi (Bending)	0.9
Phi (Compression)	0.9
Phi (Tension-Yielding)	0.9
Phi (Tension-Fracture)	0.75
Phi (Shear)	0.9
Phi (Shear-Short Webbed Rolled I)	1

Item	Value
Phi (Torsion)	0.9
Ignore Seismic Code?	No
Ignore Special Seismic Load?	No
Doubler Plate Plug-Welded?	Yes
HSS Welding Type	ERW
Reduced HSS Thickness	No
Consider Deflection?	Yes
DL Ratio	120
SDL+LL Ratio	120
LL Ratio	360
Total Ratio	240
Total Camber Limit	240
Pattern Live Load Factor	0.75
D/C Ratio Limit	0.95

Table 1.2 - Steel Column Envelope

Label	Story	Section	Moment Interaction Check	PMM Combo	V22 Ratio	V33 Ratio	Class	Cont. Plate cm²	Dbl. Plate mm	B/C Ratio Major	B/C Ratio Minor
C39	CUB1	TUBO305X100	0.165 = 0.008 + 0.154 + 0.003	COMDIS2	0.028	0.003	Seismic MD				
C40	CUB1	TUBO305X100	0.205 = 0.016 + 0.189 + 1.977E-04	COMDIS2	0.035	0.002	Seismic MD				
C41	CUB1	TUBO305X100	0.213 = 0.015 + 0.193 + 0.004	COMDIS2	0.035	0.003	Seismic MD				
C42	CUB1	TUBO305X100	0.203 = 0.01 + 0.181 + 0.011	COMDIS2	0.033	0.003	Seismic MD				
C43-1	CUB1	TUBO305X100	0.662 = 0.044 + 0.409 + 0.209	COMDIS2	0.168	0.14	Seismic MD				
C44-1	CUB1	TUBO305X100	0.214 = 0.033 + 0.164 + 0.017	COMDIS2	0.119	0.068	Seismic MD				
C45-1	CUB1	TUBO305X100	0.767 = 0.033 + 0.545 + 0.19	COMDIS2	0.213	0.154	Seismic MD				
C46-1	CUB1	TUBO305X100	0.22 = 0.029 + 0.159 + 0.032	COMDIS2	0.119	0.106	Seismic MD				
C47-1	CUB1	TUBO305X100	0.73 = 0.034 + 0.571 + 0.125	COMDIS2	0.221	0.111	Seismic MD				
C48-1	CUB1	TUBO305X100	0.219 = 0.031 + 0.163 + 0.025	COMDIS2	0.124	0.046	Seismic MD				
C49-1	CUB1	TUBO305X100	0.491 = 0.025 + 0.334 + 0.132	COMDIS2	0.138	0.068	Seismic MD				
C50-1	CUB1	TUBO305X100	0.132 = 0.017 + 0.05 + 0.065	COMDIS2	0.059	0.012	Seismic MD				

Table 1.3 - Steel Beam Envelope

Label	Story	Section	Moment Interaction Check	PMM Combo	V22 Ratio	V33 Ratio	Class	Conn. V I-End kN	Conn. V J-End kN
B299	CUB1	TUBO305X100	0.059 = 0.004 + 0.052 + 0.002	COMDIS2	0.005	0.0003865	Seismic MD	1.3606	3.6112
B300	CUB1	TUBO305X100	0.06 = 0.012 + 0.046 + 0.002	COMDIS2	0.004	0.0002401	Seismic MD	1.8136	3.0212

Label	Story	Section	Moment Interaction Check	PMM Combo	V22 Ratio	V33 Ratio	Class	Conn. V I-End kN	Conn. V J-End kN
B301	CUB1	TUBO305X100	0.118 = 0.022 + 0.095 + 0.001	COMDIS2	0.006	0	Seismic MD	1.0968	4.2137
B302	CUB1	TUBO305X100	0.059 = 0.023 + 0.035 + 0.001	COMDIS2	0.004	0.0002239	Seismic MD	1.7003	3.0683
B303	CUB1	TUBO305X100	0.03 = 0.002 + 0.026 + 0.002	COMDIS2	0.003	0.0001975	Seismic MD	2.1521	2.4621
B304	CUB1	TUBO305X100	0.072 = 0.009 + 0.06 + 0.003	COMDIS2	0.004	0.0001972	Seismic MD	1.5751	3.3173
B305	CUB1	TUBO305X100	0.029 = 0.002 + 0.026 + 0.001	COMDIS1	0.004	0.000166	Seismic MD	1.952	2.6365
B306	CUB1	TUBO305X100	0.027 = 0.001 + 0.025 + 0.001	COMDIS1	0.003	0.0001322	Seismic MD	2.2115	2.3777
B307	CUB1	TUBO305X100	0.024 = 0.001 + 0.022 + 0.001	COMDIS1	0.004	0.0001325	Seismic MD	2.417	2.1949
B143	PISO2	TUBO305X100	0.175 = 0 + 0.175 + 0	COMDIS2	0.027	0	Seismic MD	0	18.8139
B159	PISO2	TUBO305X100	0.29 = 0 + 0.29 + 0	COMDIS2	0.038	0	Seismic MD	0	26.3447
B163	PISO2	TUBO305X100	0.278 = 0 + 0.278 + 0	COMDIS2	0.037	0	Seismic MD	0	25.4684
B169	PISO2	TUBO305X100	0.218 = 0 + 0.218 + 0	COMDIS2	0.032	0	Seismic MD	0	22.0379
B274	PISO2	TUBO305X100	0.278 = 0 + 0.278 + 0	COMDIS2	0.042	0	Seismic MD	0	0
B286	PISO2	TUBO305X100	0.2 = 0 + 0.2 + 0	COMDIS2	0.026	0	Seismic MD	0	0
B287	PISO2	TUBO305X100	0.24 = 0 + 0.24 + 0	COMDIS2	0.036	0	Seismic MD	0	24.9947
B289	PISO2	TUBO305X100	0.115 = 0 + 0.115 + 0	COMDIS2	0.018	0	Seismic MD	0	0
B290	PISO2	TUBO305X100	0.262 = 0 + 0.262 + 0	COMDIS2	0.04	0	Seismic MD	0	0
B291	PISO2	TUBO305X100	0.277 = 0 + 0.277 + 0	COMDIS2	0.038	0	Seismic MD	0	0
B292	PISO2	TUBO305X100	0.295 = 0 + 0.295 + 0	COMDIS2	0.043	0	Seismic MD	0	0
B293	PISO2	TUBO305X100	0.249 = 0 + 0.249 + 0	COMDIS2	0.038	0	Seismic MD	0	0
B294	PISO2	TUBO305X100	0.27 = 0 + 0.27 + 0	COMDIS2	0.038	0	Seismic MD	0	0
B295	PISO2	TUBO305X100	0.288 = 0 + 0.288 + 0	COMDIS2	0.041	0	Seismic MD	0	0
B296	PISO2	TUBO305X100	0.193 = 0 + 0.193 + 0	COMDIS2	0.027	0	Seismic MD	0	0
B297	PISO2	TUBO305X100	0.012 = 0 + 0.012 + 0	COMDIS2	0.007	0	Seismic MD	0	0
B298	PISO2	TUBO305X100	0.068 = 0 + 0.068 + 0	COMDIS2	0.023	0	Seismic MD	16.1825	0

Table 1.4 - Steel Brace Envelope

Label	Story	Section	Moment Interaction Check	PMM Combo	V22 Ratio	V33 Ratio	Class	Conn. P I-End kN	Conn. P J-End kN
D2	CUB2	TUBO305X100	0.041 = 0.001 + 0.04 + 0	COMDIS2	0.012	0	Seismic MD	-2.7267	0

Label	Story	Section	Moment Interaction Check	PMM Combo	V22 Ratio	V33 Ratio	Class	Conn. P I-End kN	Conn. P J-End kN
D5	CUB2	TUBO305X100	0.041 = 0.001 + 0.04 + 0	COMDIS2	0.012	0	Seismic MD	-2.7267	0
D8	CUB2	TUBO305X100	0.041 = 0.001 + 0.04 + 0	COMDIS2	0.012	0	Seismic MD	-2.7267	0
D11	CUB2	TUBO305X100	0.041 = 0.001 + 0.04 + 0	COMDIS2	0.012	0	Seismic MD	-2.7267	0
D13	CUB1	TUBO305X100	0.189 = 0.044 + 0.102 + 0.043	COMDIS2	0.018	0.013	Seismic MD	127.7213	132.5425
D14	CUB1	TUBO305X100	0.321 = 0.002 + 0.306 + 0.013	COMDIS2	0.037	0.001	Seismic MD	-11.7695	-7.1849
D15	CUB1	TUBO305X100	0.148 = 0.026 + 0.097 + 0.025	COMDIS2	0.032	0.045	Seismic MD	76.7997	78.5927
D16	CUB1	TUBO305X100	0.124 = 0.023 + 0.09 + 0.01	COMDIS2	0.023	0.001	Seismic MD	-25.317	-18.8777
D17	CUB1	TUBO305X100	0.178 = 0.061 + 0.104 + 0.013	COMDIS2	0.017	0.003	Seismic MD	176.8173	181.6384
D18	CUB1	TUBO305X100	0.372 = 0.006 + 0.358 + 0.008	COMDIS2	0.04	0.001	Seismic MD	17.5378	25.8652
D19	CUB1	TUBO305X100	0.154 = 0.033 + 0.109 + 0.013	COMDIS2	0.032	0.011	Seismic MD	95.8473	97.6403
D20	CUB1	TUBO305X100	0.122 = 0.006 + 0.117 + 0	COMDIS2	0.024	0	Seismic MD	-13.6759	-7.4242
D21	CUB1	TUBO305X100	0.182 = 0.063 + 0.104 + 0.014	COMDIS2	0.016	0.005	Seismic MD	184.444	189.2651
D22	CUB1	TUBO305X100	0.376 = 0.006 + 0.362 + 0.008	COMDIS2	0.04	0.001	Seismic MD	19.1365	27.464
D23	CUB1	TUBO305X100	0.163 = 0.035 + 0.114 + 0.014	COMDIS2	0.034	0.025	Seismic MD	101.5419	103.3349
D24	CUB1	TUBO305X100	0.128 = 0.004 + 0.123 + 0.001	COMDIS2	0.025	0	Seismic MD	-12.5735	7.0427
D25	CUB1	TUBO305X100	0.128 = 0.031 + 0.083 + 0.013	COMDIS2	0.016	0.008	Seismic MD	89.0951	93.9163
D26	CUB1	TUBO305X100	0.282 = 0.013 + 0.269 + 4.521E-04	COMDIS2	0.034	0.000339	Seismic MD	-18.008	-13.4235
D27	CUB1	TUBO305X100	0.136 = 0.006 + 0.005 + 0.125	COMDIS2	0.015	0.059	Seismic MD	16.6563	18.4493
D28	CUB1	TUBO305X100	0.116 = 0.032 + 0.081 + 0.002	COMDIS2	0.022	0.0002107	Seismic MD	-35.1259	-23.7703
D29	CUB1	TUBO305X100	0.136 = 0.034 + 0.019 + 0.084	COMDIS2	0.005	0.017	Seismic MD	101.8479	102.2133
D30	CUB1	TUBO305X100	0.099 = 0.017 + 0.067 + 0.015	COMDIS2	0.007	0.004	Seismic MD	50.6952	50.8311

Table 1.5 - Steel Frame Summary - AISC 360-10 (Part 1 of 2)

Story	Label	Unique Name	Design Type	Design Section	Status	PMM Combo	PMM Ratio	P Ratio	M Major Ratio	M Minor Ratio
CUB1	C39	119	Column	TUBO305X100	No Message	COMDIS2(C)	0.165	0.008	0.154	0.003
CUB1	C40	120	Column	TUBO305X100	No Message	COMDIS2(C)	0.205	0.016	0.189	0.0001977
CUB1	C41	121	Column	TUBO305X100	No Message	COMDIS2(C)	0.213	0.015	0.193	0.004
CUB1	C42	122	Column	TUBO305X100	No Message	COMDIS2(C)	0.203	0.01	0.181	0.011
CUB1	C43-1	137	Column	TUBO305X100	No Message	COMDIS2(C)	0.662	0.044	0.409	0.209

Story	Label	Unique Name	Design Type	Design Section	Status	PMM Combo	PMM Ratio	P Ratio	M Major Ratio	M Minor Ratio
CUB1	C44-1	138	Column	TUBO305X100	No Message	COMDIS2(C)	0.214	0.033	0.164	0.017
CUB1	C45-1	143	Column	TUBO305X100	No Message	COMDIS2(C)	0.767	0.033	0.545	0.19
CUB1	C46-1	144	Column	TUBO305X100	No Message	COMDIS2(C)	0.22	0.029	0.159	0.032
CUB1	C47-1	149	Column	TUBO305X100	No Message	COMDIS2(C)	0.73	0.034	0.571	0.125
CUB1	C48-1	150	Column	TUBO305X100	No Message	COMDIS2(C)	0.219	0.031	0.163	0.025
CUB1	C49-1	155	Column	TUBO305X100	No Message	COMDIS2(C)	0.491	0.025	0.334	0.132
CUB1	C50-1	156	Column	TUBO305X100	No Message	COMDIS2(C)	0.132	0.017	0.05	0.065
CUB1	B299	173	Beam	TUBO305X100	No Message	COMDIS2(T)	0.059	0.004	0.052	0.002
CUB1	B300	174	Beam	TUBO305X100	No Message	COMDIS2(T)	0.06	0.012	0.046	0.002
CUB1	B301	175	Beam	TUBO305X100	No Message	COMDIS2(T)	0.118	0.022	0.095	0.001
CUB1	B302	177	Beam	TUBO305X100	No Message	COMDIS2(C)	0.059	0.023	0.035	0.001
CUB1	B303	178	Beam	TUBO305X100	No Message	COMDIS2(T)	0.03	0.002	0.026	0.002
CUB1	B304	179	Beam	TUBO305X100	No Message	COMDIS2(T)	0.072	0.009	0.06	0.003
CUB1	B305	181	Beam	TUBO305X100	No Message	COMDIS1(C)	0.029	0.002	0.026	0.001
CUB1	B306	182	Beam	TUBO305X100	No Message	COMDIS1(C)	0.027	0.001	0.025	0.001
CUB1	B307	183	Beam	TUBO305X100	No Message	COMDIS1(C)	0.024	0.001	0.022	0.001
CUB1	B307		Beam	TUBO305X100	No Message	COMDIS4(T)	0.019	0	0.018	0.001
PISO2	B143	107	Beam	TUBO305X100	No Message	COMDIS2(C)	0.175	0	0.175	0
PISO2	B159	108	Beam	TUBO305X100	No Message	COMDIS2(C)	0.29	0	0.29	0
PISO2	B163	109	Beam	TUBO305X100	No Message	COMDIS2(C)	0.278	0	0.278	0
PISO2	B169	110	Beam	TUBO305X100	No Message	COMDIS2(C)	0.218	0	0.218	0
PISO2	B274	111	Beam	TUBO305X100	Warning: See Message	COMDIS2(C)	0.278	0	0.278	0
PISO2	B286	112	Beam	TUBO305X100	No Message	COMDIS2(C)	0.2	0	0.2	0
PISO2	B287	113	Beam	TUBO305X100	No Message	COMDIS2(C)	0.24	0	0.24	0
PISO2	B289	115	Beam	TUBO305X100	No Message	COMDIS2(C)	0.115	0	0.115	0
PISO2	B290	116	Beam	TUBO305X100	No Message	COMDIS2(C)	0.262	0	0.262	0
PISO2	B291	117	Beam	TUBO305X100	No Message	COMDIS2(C)	0.277	0	0.277	0
PISO2	B292	118	Beam	TUBO305X100	No Message	COMDIS2(C)	0.295	0	0.295	0
PISO2	B293	123	Beam	TUBO305X100	No Message	COMDIS2(C)	0.249	0	0.249	0

Story	Label	Unique Name	Design Type	Design Section	Status	PMM Combo	PMM Ratio	P Ratio	M Major Ratio	M Minor Ratio
PISO2	B294	124	Beam	TUBO305X100	No Message	COMDIS2(C)	0.27	0	0.27	0
PISO2	B295	125	Beam	TUBO305X100	No Message	COMDIS2(C)	0.288	0	0.288	0
PISO2	B296	126	Beam	TUBO305X100	No Message	COMDIS2(C)	0.193	0	0.193	0
PISO2	B297	131	Beam	TUBO305X100	No Message	COMDIS2(C)	0.012	0	0.012	0
PISO2	B298	132	Beam	TUBO305X100	No Message	COMDIS2(C)	0.068	0	0.068	0
CUB2	D2	127	Brace	TUBO305X100	No Message	COMDIS2(C)	0.041	0.001	0.04	0
CUB2	D2		Brace	TUBO305X100	No Message	COMDIS6(T)	0	0	0	0
CUB2	D5	128	Brace	TUBO305X100	No Message	COMDIS2(C)	0.041	0.001	0.04	0
CUB2	D5		Brace	TUBO305X100	No Message	COMDIS6(T)	0	0	0	0
CUB2	D8	129	Brace	TUBO305X100	No Message	COMDIS2(C)	0.041	0.001	0.04	0
CUB2	D8		Brace	TUBO305X100	No Message	COMDIS6(T)	0	0	0	0
CUB2	D11	130	Brace	TUBO305X100	No Message	COMDIS2(C)	0.041	0.001	0.04	0
CUB2	D11		Brace	TUBO305X100	No Message	COMDIS6(T)	0	0	0	0
CUB1	D13	133	Brace	TUBO305X100	No Message	COMDIS2(T)	0.189	0.044	0.102	0.043
CUB1	D14	134	Brace	TUBO305X100	No Message	COMDIS2(C)	0.321	0.002	0.306	0.013
CUB1	D14		Brace	TUBO305X100	No Message	COMDIS2(T)	0.072	0.002	0.063	0.007
CUB1	D15	135	Brace	TUBO305X100	No Message	COMDIS2(T)	0.148	0.026	0.097	0.025
CUB1	D16	136	Brace	TUBO305X100	No Message	COMDIS2(C)	0.124	0.023	0.09	0.01
CUB1	D17	139	Brace	TUBO305X100	No Message	COMDIS2(T)	0.178	0.061	0.104	0.013
CUB1	D18	140	Brace	TUBO305X100	No Message	COMDIS2(T)	0.372	0.006	0.358	0.008
CUB1	D19	141	Brace	TUBO305X100	No Message	COMDIS2(T)	0.154	0.033	0.109	0.013
CUB1	D20	142	Brace	TUBO305X100	No Message	COMDIS2(C)	0.122	0.006	0.117	0
CUB1	D20		Brace	TUBO305X100	No Message	COMDIS2(T)	0.034	0.002	0.032	0.0001199
CUB1	D21	145	Brace	TUBO305X100	No Message	COMDIS2(T)	0.182	0.063	0.104	0.014
CUB1	D22	146	Brace	TUBO305X100	No Message	COMDIS2(T)	0.376	0.006	0.362	0.008
CUB1	D23	147	Brace	TUBO305X100	No Message	COMDIS2(T)	0.163	0.035	0.114	0.014
CUB1	D24	148	Brace	TUBO305X100	No Message	COMDIS2(C)	0.128	0.004	0.123	0.001
CUB1	D24		Brace	TUBO305X100	No Message	COMDIS2(T)	0.051	0.0004566	0.05	0.001
CUB1	D25	151	Brace	TUBO305X100	No Message	COMDIS2(T)	0.128	0.031	0.083	0.013

Story	Label	Unique Name	Design Type	Design Section	Status	PMM Combo	PMM Ratio	P Ratio	M Major Ratio	M Minor Ratio
CUB1	D26	152	Brace	TUBO305X100	No Message	COMDIS2(C)	0.282	0.013	0.269	0.0004521
CUB1	D27	153	Brace	TUBO305X100	No Message	COMDIS2(T)	0.136	0.006	0.005	0.125
CUB1	D28	154	Brace	TUBO305X100	No Message	COMDIS2(C)	0.116	0.032	0.081	0.002
CUB1	D29	176	Brace	TUBO305X100	No Message	COMDIS2(T)	0.136	0.034	0.019	0.084
CUB1	D30	180	Brace	TUBO305X100	No Message	COMDIS2(T)	0.099	0.017	0.067	0.015

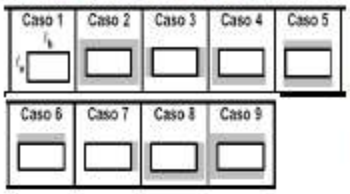
Table 1.5 - Steel Frame Summary - AISC 360-10 (Part 2 of 2)

Story	Label	Unique Name	V Major Combo	V Major Ratio	V Minor Combo	V Minor Ratio	Message
CUB1	C39	119	COMDIS2	0.028	COMDIS1	0.003	
CUB1	C40	120	COMDIS2	0.035	COMDIS2	0.002	
CUB1	C41	121	COMDIS2	0.035	COMDIS2	0.003	
CUB1	C42	122	COMDIS2	0.033	COMDIS1	0.003	
CUB1	C43-1	137	COMDIS2	0.168	COMDIS2	0.14	
CUB1	C44-1	138	COMDIS2	0.119	COMDIS2	0.068	
CUB1	C45-1	143	COMDIS2	0.213	COMDIS2	0.154	
CUB1	C46-1	144	COMDIS2	0.119	COMDIS2	0.106	
CUB1	C47-1	149	COMDIS2	0.221	COMDIS2	0.111	
CUB1	C48-1	150	COMDIS2	0.124	COMDIS2	0.046	
CUB1	C49-1	155	COMDIS2	0.138	COMDIS2	0.068	
CUB1	C50-1	156	COMDIS2	0.059	COMDIS2	0.012	
CUB1	B299	173	COMDIS2	0.005	COMDIS2	0.0003865	
CUB1	B300	174	COMDIS2	0.004	COMDIS2	0.0002401	
CUB1	B301	175	COMDIS2	0.006	COMDIS2	0	
CUB1	B302	177	COMDIS1	0.004	COMDIS2	0.0002239	
CUB1	B303	178	COMDIS1	0.003	COMDIS2	0.0001975	
CUB1	B304	179	COMDIS2	0.004	COMDIS2	0.0001972	
CUB1	B305	181	COMDIS1	0.004	COMDIS2	0.000166	
CUB1	B306	182	COMDIS1	0.003	COMDIS2	0.0001322	
CUB1	B307	183	COMDIS1	0.004	COMDIS2	0.0001325	
CUB1	B307						
PISO2	B143	107	COMDIS2	0.027	COMDIS6	0	
PISO2	B159	108	COMDIS2	0.038	COMDIS6	0	
PISO2	B163	109	COMDIS2	0.037	COMDIS6	0	
PISO2	B169	110	COMDIS2	0.032	COMDIS6	0	
PISO2	B274	111	COMDIS2	0.042	COMDIS6	0	kl/r > 200
PISO2	B286	112	COMDIS2	0.026	COMDIS6	0	
PISO2	B287	113	COMDIS2	0.036	COMDIS6	0	
PISO2	B289	115	COMDIS2	0.018	COMDIS6	0	
PISO2	B290	116	COMDIS2	0.04	COMDIS6	0	
PISO2	B291	117	COMDIS2	0.038	COMDIS6	0	
PISO2	B292	118	COMDIS2	0.043	COMDIS6	0	
PISO2	B293	123	COMDIS2	0.038	COMDIS6	0	
PISO2	B294	124	COMDIS2	0.038	COMDIS6	0	

Story	Label	Unique Name	V Major Combo	V Major Ratio	V Minor Combo	V Minor Ratio	Message
PISO2	B295	125	COMDIS2	0.041	COMDIS6	0	
PISO2	B296	126	COMDIS2	0.027	COMDIS6	0	
PISO2	B297	131	COMDIS2	0.007	COMDIS6	0	
PISO2	B298	132	COMDIS2	0.023	COMDIS6	0	
CUB2	D2	127	COMDIS2	0.012	COMDIS6	0	
CUB2	D2						
CUB2	D5	128	COMDIS2	0.012	COMDIS6	0	
CUB2	D5						
CUB2	D8	129	COMDIS2	0.012	COMDIS6	0	
CUB2	D8						
CUB2	D11	130	COMDIS2	0.012	COMDIS6	0	
CUB2	D11						
CUB1	D13	133	COMDIS2	0.018	COMDIS2	0.013	
CUB1	D14	134	COMDIS2	0.037	COMDIS2	0.001	
CUB1	D14						
CUB1	D15	135	COMDIS2	0.032	COMDIS2	0.045	
CUB1	D16	136	COMDIS2	0.023	COMDIS2	0.001	
CUB1	D17	139	COMDIS2	0.017	COMDIS2	0.003	
CUB1	D18	140	COMDIS2	0.04	COMDIS2	0.001	
CUB1	D19	141	COMDIS2	0.032	COMDIS2	0.011	
CUB1	D20	142	COMDIS2	0.024	COMDIS1	0	
CUB1	D20						
CUB1	D21	145	COMDIS2	0.016	COMDIS2	0.005	
CUB1	D22	146	COMDIS2	0.04	COMDIS2	0.001	
CUB1	D23	147	COMDIS2	0.034	COMDIS2	0.025	
CUB1	D24	148	COMDIS2	0.025	COMDIS1	0	
CUB1	D24						
CUB1	D25	151	COMDIS2	0.016	COMDIS2	0.008	
CUB1	D26	152	COMDIS2	0.034	COMDIS1	0.000339	
CUB1	D27	153	COMDIS2	0.015	COMDIS2	0.059	
CUB1	D28	154	COMDIS2	0.022	COMDIS1	0.0002107	
CUB1	D29	176	COMDIS2	0.005	COMDIS2	0.017	
CUB1	D30	180	COMDIS2	0.007	COMDIS2	0.004	

PROYECTO: INSTITUCION EDUCATIVA SIXTO MARIA
DISEÑO PLACA MACIZA TIPO (EN DOS DIRECCIONES)

El diseño de la placa maciza se realiza de acuerdo con lo establecido en C.13.9 de las NSR - 10



Geometría de la losa

la =	2.52	m	fy =	420	MPa
lb =	2.93	m	f'c =	21.1	MPa
Relación m =	0.86				

Espesor escogido: 0.10 m

Cargas

Peso propio de la losa	0.1x1.0x24	2.40	kN/m²
Impermeabilización	0.05x20	1.00	kN/m²
Carga Muerta adicional		0.50	kN/m²
Carga Muerta Total		3.90	kN/m²
Carga Viva		5.00	kN/m²
Carga Última		12.68	kN/m²

Tipo de soporte CASO Nº 2

DISEÑO A MOMENTO FLECTOR

Coeficientes para momento positivo por carga muerta y viva:

C_{aD} =	0.045						
C_{bD} =	0.029						
C_{aV} =	0.045						
C_{bV} =	0.029						
Mu_a =	**2.54**	kN.m	*Cuantía:*	0.0018	*As =*	1.80 cm²/m
Mu_b =	**2.22**	kN.m	*Cuantía:*	0.0018	*As =*	1.80 cm²/m

Coeficientes para momento negativo por carga última:

C_a =	0.055	Mu_a =	**4.43**	kN.m	*Cuantía:*	0.0019	*As =*	1.92 cm²/m
C_b =	0.037	Mu_b =	**4.03**	kN.m	*Cuantía:*	0.0018	*As =*	1.80 cm²/m

Distribución de refuerzo:
Colocar malla electrosoldada diametro 6mm c/.15 longitudinalmente, en sentido a (Arriba)
Colocar malla electrosoldada diametro 6mm c/.15 longitudinalmente, sentido b (Abajo)

REVISIÓN A CORTANTE

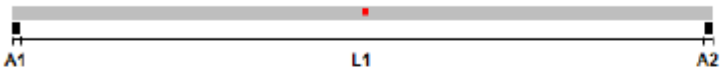
Coeficientes de relación de carga en las dos direcciones para cortante:

W_a =	0.60		
W_b =	0.40		
ϕvC =	**0.574**	**MPa**	
ϕvU_a =	**0.111**	**MPa**	**OK**
ϕvU_b =	**0.064**	**MPa**	**OK**

REPORTE DE CORREAS

PHR C con atiesador 355 x 110 x 25 (2.00 mm)
con Fy = 35.15 Kgf/mm² cada 1.50 m con arriostramiento cada L/2.

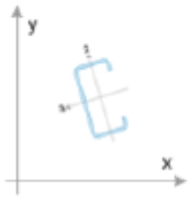
SECCION LONGITUDINAL



L1	6.46 m
A1	0.10 m
A2	0.10 m

CONFIGURACION	
TIPO DE CARGA	DISTRIBUIDA
Carga muerta	0.20 KN/m²
Peso propio correa	0.09 KN/m
Carga viva	0.50 KN/m²
Carga granizo	0.50 KN/m²
Viento compresión (Perpendicular)	0.40 KN/m²
Viento succión (Perpendicular)	0.40 KN/m²
Pendiente sección transversal	16° = 28.6750%

SECCION TRANSVERSAL



L = 1.50 m

REPORTES DE DISEÑO

REPORTE FLEXION				
	Apoyos		Interiores	
Ejes locales	3	2	3	2
Resistente (KN.m)	34.1957	5.9203	24.4724	5.9203
Calculado (KN.m)	5.3937E-06	9.9599E-08	17.4667	1.0551

REPORTE CORTANTE		
Ejes locales	2	3
Resistente (KN)	21.6826	75.4562
Calculado (KN)	8.1501	0.9890

REPORTE DEFLEXION		
Deflexiones máximas	Instantanea	Permanente
Admisible (m)	0.0317	0.0000
Calculado (m)	0.0109	0.0000

COMBINACIONES DE CARGA					
No	Muerta	Viva	Granizo	Viento compresión	Viento succión
1	1.4000	0.0000	0.0000	0.0000	0.0000
2	1.2000	0.5000	0.0000	0.0000	0.0000
3	1.2000	0.0000	0.5000	0.0000	0.0000
4	1.2000	1.6000	0.0000	0.5000	0.0000
5	1.2000	0.0000	1.6000	0.5000	0.0000
6	1.2000	1.6000	0.0000	0.0000	0.5000
7	1.2000	0.0000	1.6000	0.0000	0.5000
8	1.2000	0.5000	0.0000	0.0000	1.0000
9	1.2000	0.0000	0.5000	0.0000	1.0000
10	1.2000	0.5000	0.0000	1.0000	0.0000
11	1.2000	0.0000	0.5000	1.0000	0.0000
12	0.9000	0.0000	0.0000	0.0000	1.0000
13	0.9000	0.0000	0.0000	1.0000	0.0000

REACCIONES - EJES GLOBALES (KN-m)

Elementos calculados con el programa de diseño Arquimet 2.0 de ACESCO

APOYO 1		
Combinacion	Rx	Ry
Muerta	-0.2786	1.6028
Viva de Cub.	-0.5316	3.0576
Granizo	-0.5316	3.0576
Viento Comp.	-0.7078	2.4685
Viento Succion	0.7078	-2.4685
Comb. 1	-0.3901	2.2439
Comb. 2	-0.6002	3.4521
Comb. 3	-0.6002	3.4521
Comb. 4	-1.5388	8.0497
Comb. 5	-1.5388	8.0497
Comb. 6	-1.5388	8.0497
Comb. 7	-1.5388	8.0497
Comb. 8	-1.3080	5.9206
Comb. 9	-1.3080	5.9206
Comb. 10	-1.3080	5.9206
Comb. 11	-1.3080	5.9206
Comb. 12	-0.9586	3.9110
Comb. 13	-0.9586	3.9110

APOYO 2		
Combinacion	Rx	Ry
Muerta	-0.2786	1.6028
Viva de Cub.	-0.5316	3.0576
Granizo	-0.5316	3.0576
Viento Comp.	-0.7078	2.4685
Viento Succion	0.7078	-2.4685
Comb. 1	-0.3901	2.2439
Comb. 2	-0.6002	3.4521
Comb. 3	-0.6002	3.4521
Comb. 4	-1.5388	8.0497
Comb. 5	-1.5388	8.0497
Comb. 6	-1.5388	8.0497
Comb. 7	-1.5388	8.0497
Comb. 8	-1.3080	5.9206
Comb. 9	-1.3080	5.9206
Comb. 10	-1.3080	5.9206
Comb. 11	-1.3080	5.9206
Comb. 12	-0.9586	3.9110
Comb. 13	-0.9586	3.9110

FUERZAS INTERNAS - EJES LOCALES (KN-m)

Elementos calculados con el programa de diseño Arquimet 2.0 de ACESCO

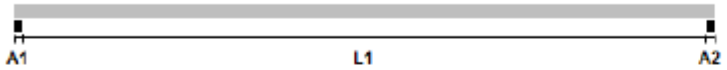
APOYO 1				
Combinacion	R2	R3	M2	M3
Muerta	0.1739	1.6175	0.0000	-4.9799E-07
Viva de Cub.	0.3318	3.0856	0.0000	-9.8307E-07
Granizo	0.3318	3.0856	0.0000	-9.8307E-07
Viento Comp.	0.0000	2.5680	0.0000	-2.1452E-06
Viento Succion	0.0000	2.5680	0.0000	-2.1452E-06
Comb. 1	0.2435	2.2645	0.0000	-6.9719E-07
Comb. 2	0.3746	3.4838	0.0000	-7.8913E-07
Comb. 3	0.3746	3.4838	0.0000	-7.8913E-07
Comb. 4	0.7396	8.1620	0.0000	-2.2831E-06
Comb. 5	0.7396	8.1620	0.0000	-2.2831E-06
Comb. 6	0.7396	8.1620	0.0000	-2.2831E-06
Comb. 7	0.7396	8.1620	0.0000	-2.2831E-06
Comb. 8	0.3746	6.0518	0.0000	-2.9343E-06
Comb. 9	0.3746	6.0518	0.0000	-2.9343E-06
Comb. 10	0.3746	6.0518	0.0000	-2.9343E-06
Comb. 11	0.3746	6.0518	0.0000	-2.9343E-06
Comb. 12	0.1565	4.0237	0.0000	-2.5934E-06
Comb. 13	0.1565	4.0237	0.0000	-2.5934E-06

APOYO 2				
Combinacion	R2	R3	M2	M3
Muerta	0.1739	1.6175	1.9154E-08	-1.2258E-06
Viva de Cub.	0.3318	3.0856	-7.6514E-08	-2.4517E-06
Granizo	0.3318	3.0856	-7.6514E-08	-2.4517E-06
Viento Comp.	0.0000	2.5680	0.0000	0.0000
Viento Succion	0.0000	2.5680	0.0000	0.0000
Comb. 1	0.2435	2.2645	2.6815E-08	-1.7162E-06
Comb. 2	0.3746	3.4838	-1.5323E-08	-2.6968E-06
Comb. 3	0.3746	3.4838	-1.5323E-08	-2.6968E-06
Comb. 4	0.7396	8.1620	-9.9599E-08	-5.3937E-06
Comb. 5	0.7396	8.1620	-9.9599E-08	-5.3937E-06
Comb. 6	0.7396	8.1620	-9.9599E-08	-5.3937E-06
Comb. 7	0.7396	8.1620	-9.9599E-08	-5.3937E-06
Comb. 8	0.3746	6.0518	-1.5323E-08	-2.6968E-06
Comb. 9	0.3746	6.0518	-1.5323E-08	-2.6968E-06
Comb. 10	0.3746	6.0518	-1.5323E-08	-2.6968E-06
Comb. 11	0.3746	6.0518	-1.5323E-08	-2.6968E-06
Comb. 12	0.1565	4.0237	1.7238E-08	-1.1032E-06
Comb. 13	0.1565	4.0237	1.7238E-08	-1.1032E-06

REPORTE DE CORREAS

PHR Cajón 305 x 80 x 25 (2.00 mm)
con Fy = 35.15 Kgf/mm² cada 1.50 m sin arriostramiento interior.

SECCION LONGITUDINAL



L1	8.50 m
A1	0.10 m
A2	0.10 m

CONFIGURACION	
TIPO DE CARGA	DISTRIBUIDA
Carga muerta	0.20 KN/m²
Peso propio correa	0.15 KN/m
Carga viva	0.50 KN/m²
Carga granizo	0.50 KN/m²
Viento compresión (Perpendicular)	0.40 KN/m²
Viento succión (Perpendicular)	0.40 KN/m²
Pendiente sección transversal	16° = 28.6750%

SECCION TRANSVERSAL

L = 1.50 m

REPORTES DE DISEÑO

REPORTE FLEXION				
	Apoyos		Interiores	
Ejes locales	3	2	3	2
Resistente (KN.m)	51.3363	16.5632	51.3363	16.5632
Calculado (KN.m)	4.9646E-06	7.5082E-07	18.2723	4.4442

REPORTE CORTANTE		
Ejes locales	2	3
Resistente (KN)	51.2849	103.7523
Calculado (KN)	8.4864	2.0641

REPORTE DEFLEXION		
Deflexiones máximas	Instantanea	Permanente
Admisible (m)	0.0319	0.0000
Calculado (m)	0.0096	0.0000

COMBINACIONES DE CARGA					
No	Muerta	Viva	Granizo	Viento compresión	Viento succión
1	1.4000	0.0000	0.0000	0.0000	0.0000
2	1.2000	0.5000	0.0000	0.0000	0.0000
3	1.2000	0.0000	0.5000	0.0000	0.0000
4	1.2000	1.6000	0.0000	0.5000	0.0000
5	1.2000	0.0000	1.6000	0.5000	0.0000
6	1.2000	1.6000	0.0000	0.0000	0.5000
7	1.2000	0.0000	1.6000	0.0000	0.5000
8	1.2000	0.5000	0.0000	0.0000	1.0000
9	1.2000	0.0000	0.5000	0.0000	1.0000
10	1.2000	0.5000	0.0000	1.0000	0.0000
11	1.2000	0.0000	0.5000	1.0000	0.0000
12	0.9000	0.0000	0.0000	0.0000	1.0000
13	0.9000	0.0000	0.0000	1.0000	0.0000

REACCIONES - EJES GLOBALES (KN-m)

Elementos calculados con el programa de diseño Arquimet 2.0 de ACESCO

APOYO 1		
Combinacion	Rx	Ry
Muerta	1.3468E-08	1.9494
Viva de Cub.	-8.2774E-08	3.2250
Granizo	-8.2774E-08	3.2250
Viento Comp.	-0.7111	2.4801
Viento Succion	0.7111	-2.4801
Comb. 1	2.2027E-08	2.7291
Comb. 2	-3.1567E-08	3.9518
Comb. 3	-3.1567E-08	3.9518
Comb. 4	-0.3556	8.7393
Comb. 5	-0.3556	8.7393
Comb. 6	-0.3556	8.7393
Comb. 7	-0.3556	8.7393
Comb. 8	-0.7111	6.4318
Comb. 9	-0.7111	6.4318
Comb. 10	-0.7111	6.4318
Comb. 11	-0.7111	6.4318
Comb. 12	-0.7111	4.2345
Comb. 13	-0.7111	4.2345

APOYO 2		
Combinacion	Rx	Ry
Muerta	2.4040E-08	1.9494
Viva de Cub.	8.2209E-08	3.2250
Granizo	8.2209E-08	3.2250
Viento Comp.	-0.7111	2.4801
Viento Succion	0.7111	-2.4801
Comb. 1	3.2598E-08	2.7291
Comb. 2	1.4399E-07	3.9518
Comb. 3	1.4399E-07	3.9518
Comb. 4	-0.3556	8.7393
Comb. 5	-0.3556	8.7393
Comb. 6	-0.3556	8.7393
Comb. 7	-0.3556	8.7393
Comb. 8	-0.7111	6.4318
Comb. 9	-0.7111	6.4318
Comb. 10	-0.7111	6.4318
Comb. 11	-0.7111	6.4318
Comb. 12	-0.7111	4.2345
Comb. 13	-0.7111	4.2345

FUERZAS INTERNAS - EJES LOCALES (KN-m) *Elementos calculados con el programa de diseño Arquimet 2.0 de ACESCO*

APOYO 1				
Combinacion	R2	R3	M2	M3
Muerta	0.5373	1.8739	7.6614E-08	-3.0646E-07
Viva de Cub.	0.8889	3.1001	0.0000	-5.1252E-07
Granizo	0.8889	3.1001	0.0000	-5.1252E-07
Viento Comp.	0.0000	2.5800	0.0000	-5.1252E-07
Viento Succion	0.0000	2.5800	0.0000	-5.1252E-07
Comb. 1	0.7522	2.6234	1.0726E-07	-4.2904E-07
Comb. 2	1.0893	3.7987	9.1937E-08	-6.7421E-07
Comb. 3	1.0893	3.7987	9.1937E-08	-6.7421E-07
Comb. 4	2.0671	8.4987	9.1937E-08	-1.6549E-06
Comb. 5	2.0671	8.4987	9.1937E-08	-1.6549E-06
Comb. 6	2.0671	8.4987	9.1937E-08	-1.6549E-06
Comb. 7	2.0671	8.4987	9.1937E-08	-1.6549E-06
Comb. 8	1.0893	6.3787	9.1937E-08	-1.2871E-06
Comb. 9	1.0893	6.3787	9.1937E-08	-1.2871E-06
Comb. 10	1.0893	6.3787	9.1937E-08	-1.2871E-06
Comb. 11	1.0893	6.3787	9.1937E-08	-1.2871E-06
Comb. 12	0.4836	4.2665	6.8963E-08	-8.8873E-07
Comb. 13	0.4836	4.2665	6.8963E-08	-8.8873E-07

APOYO 2				
Combinacion	R2	R3	M2	M3
Muerta	0.5373	1.8739	-5.3630E-07	9.1937E-07
Viva de Cub.	0.8889	3.1001	0.0000	1.6387E-06
Granizo	0.8889	3.1001	0.0000	1.6387E-06
Viento Comp.	0.0000	2.5800	0.0000	1.6387E-06
Viento Succion	0.0000	2.5800	0.0000	1.6387E-06
Comb. 1	0.7522	2.6234	-7.5082E-07	1.2871E-06
Comb. 2	1.0893	3.7987	-6.4356E-07	2.0226E-06
Comb. 3	1.0893	3.7987	-6.4356E-07	2.0226E-06
Comb. 4	2.0671	8.4987	-6.4356E-07	4.9646E-06
Comb. 5	2.0671	8.4987	-6.4356E-07	4.9646E-06
Comb. 6	2.0671	8.4987	-6.4356E-07	4.9646E-06
Comb. 7	2.0671	8.4987	-6.4356E-07	4.9646E-06
Comb. 8	1.0893	6.3787	-6.4356E-07	3.8614E-06
Comb. 9	1.0893	6.3787	-6.4356E-07	3.8614E-06
Comb. 10	1.0893	6.3787	-6.4356E-07	3.8614E-06
Comb. 11	1.0893	6.3787	-6.4356E-07	3.8614E-06
Comb. 12	0.4836	4.2665	-4.8267E-07	2.6662E-06
Comb. 13	0.4836	4.2665	-4.8267E-07	2.6662E-06

VERIFICACIÓN IRREGULARIDAD TORSIONAL

Story	Point	Load	UX	UY	UZ	Δ_1	*Irregularidad* $1.2*(\Delta_1+\Delta_2)/2$	Δ1>Irregularidad?
			m	m	m	m		
PISO2	144	COMDER1 MAX	0.034544	0.0238	0.000136	0.0182	0.0222	NO
PISO2	144	COMDER1 MIN	-0.034544	-0.0238	-0.000136	0.0182	0.0222	NO
PISO2	144	COMDER2 MAX	0.017952	0.05542	0.000136	0.0206	0.0242	NO
PISO2	144	COMDER2 MIN	-0.017952	-0.05542	-0.000136	0.0206	0.0242	NO
PISO1	144	COMDER1 MAX	0.018632	0.014892	0.000136	0.0239	0.0293	NO
PISO1	144	COMDER1 MIN	-0.018632	-0.014892	-0.000136	0.0239	0.0293	NO
PISO1	144	COMDER2 MAX	0.009928	0.036448	0.000136	0.0378	0.0445	NO
PISO1	144	COMDER2 MIN	-0.009928	-0.036448	-0.000136	0.0378	0.0445	NO
BASE	144	COMDER1 MAX	0	0	0			
BASE	144	COMDER1 MIN	0	0	0			
BASE	144	COMDER2 MAX	0	0	0			
BASE	144	COMDER2 MIN	0	0	0			

Story	Point	Load	UX	UY	UZ	Δ_1	*Irregularidad* $1.2*(\Delta_1+\Delta_2)/2$	Δ1>Irregularidad?
			m	m	m	m		
PISO2	145	COMDER1 MAX	0.034544	0.026384	0.000136	0.0187	0.0221	NO
PISO2	145	COMDER1 MIN	-0.034544	-0.026384	-0.000136	0.0187	0.0221	NO
PISO2	145	COMDER2 MAX	0.017952	0.052972	0.000204	0.0197	0.0237	NO
PISO2	145	COMDER2 MIN	-0.017952	-0.052972	-0.000204	0.0197	0.0237	NO
PISO1	145	COMDER1 MAX	0.018632	0.016592	0.000136	0.0249	0.0292	NO
PISO1	145	COMDER1 MIN	-0.018632	-0.016592	-0.000136	0.0249	0.0292	NO
PISO1	145	COMDER2 MAX	0.009928	0.03502	0.000136	0.0364	0.0441	NO
PISO1	145	COMDER2 MIN	-0.009928	-0.03502	-0.000136	0.0364	0.0441	NO
BASE	145	COMDER1 MAX	0	0	0			
BASE	145	COMDER1 MIN	0	0	0			
BASE	145	COMDER2 MAX	0	0	0			
BASE	145	COMDER2 MIN	0	0	0			

Story	Point	Load	UX	UY	UZ	Δ_1	*Irregularidad* $1.2*(\Delta_1+\Delta_2)/2$	Δ1>Irregularidad?
			m	m	m	m		
PISO2	150	COMDER1 MAX	0.03434	0.0238	0.000136	0.0181	0.0220	NO
PISO2	150	COMDER1 MIN	-0.03434	-0.0238	-0.000136	0.0181	0.0220	NO
PISO2	150	COMDER2 MAX	0.01326	0.05542	0.000068	0.0199	0.0233	NO
PISO2	150	COMDER2 MIN	-0.01326	-0.05542	-0.000068	0.0199	0.0233	NO
PISO1	150	COMDER1 MAX	0.018564	0.014892	0.000068	0.0238	0.0292	NO
PISO1	150	COMDER1 MIN	-0.018564	-0.014892	-0.000068	0.0238	0.0292	NO
PISO1	150	COMDER2 MAX	0.007208	0.036448	0.000068	0.0372	0.0437	NO
PISO1	150	COMDER2 MIN	-0.007208	-0.036448	-0.000068	0.0372	0.0437	NO
BASE	150	COMDER1 MAX	0	0	0			
BASE	150	COMDER1 MIN	0	0	0			
BASE	150	COMDER2 MAX	0	0	0			
BASE	150	COMDER2 MIN	0	0	0			

Story	Point	Load	UX	UY	UZ	Δ_1	*Irregularidad* 1.2*(Δ_1+Δ_2)/2	Δ1>Irregularidad?
			m	m	m	m		
PISO2	151	COMDER1 MAX	0.03434	0.026384	0.000136	0.0186	0.0221	NO
PISO2	151	COMDER1 MIN	-0.03434	-0.026384	-0.000136	0.0186	0.0221	NO
PISO2	151	COMDER2 MAX	0.01326	0.052972	0.000068	0.0189	0.0237	NO
PISO2	151	COMDER2 MIN	-0.01326	-0.052972	-0.000068	0.0189	0.0237	NO
PISO1	151	COMDER1 MAX	0.018564	0.016592	0.000068	0.0249	0.0293	NO
PISO1	151	COMDER1 MIN	-0.018564	-0.016592	-0.000068	0.0249	0.0293	NO
PISO1	151	COMDER2 MAX	0.007208	0.03502	0.000068	0.0358	0.0441	NO
PISO1	151	COMDER2 MIN	-0.007208	-0.03502	-0.000068	0.0358	0.0441	NO
BASE	151	COMDER1 MAX	0	0	0			
BASE	151	COMDER1 MIN	0	0	0			
BASE	151	COMDER2 MAX	0	0	0			
BASE	151	COMDER2 MIN	0	0	0			

Story	Point	Load	UX	UY	UZ	D1	Irregularidad 1.2*(D1+D2)/2	D1>Irregularidad?
PISO2	156	COMDER1 MAX	0.043316	0.0238	0.000136	0.0182358	0.022151606	NO
PISO2	156	COMDER1 MIN	-0.04332	-0.0238	-0.00014	0.0182358	0.022151606	NO
PISO2	156	COMDER2 MAX	0.016048	0.05542	0.000068	0.0205991	0.024157623	NO
PISO2	156	COMDER2 MIN	-0.01605	-0.05542	-6.8E-05	0.0205991	0.024157623	NO
PISO1	156	COMDER1 MAX	0.0238	0.014892	0.000136	0.0238521	0.029280584	NO
PISO1	156	COMDER1 MIN	-0.0238	-0.01489	-0.00014	0.0238521	0.029280584	NO
PISO1	156	COMDER2 MAX	0.008908	0.036448	0.000068	0.0377759	0.044505612	NO
PISO1	156	COMDER2 MIN	-0.00891	-0.03645	-6.8E-05	0.0377759	0.044505612	NO
BASE	156	COMDER1 MAX	0	0	0			
BASE	156	COMDER1 MIN	0	0	0			
BASE	156	COMDER2 MAX	0	0	0			
BASE	156	COMDER2 MIN	0	0	0			

Story	Point	Load	UX	UY	UZ	D1	Irregularidad 1.2*(D1+D2)/2	D1>Irregularidad?
PISO2	157	COMDER1 MAX	0.043316	0.026384	0.000136	0.0186835	0.022080478	NO
PISO2	157	COMDER1 MIN	-0.04332	-0.02638	-0.00014	0.0186835	0.022080478	NO
PISO2	157	COMDER2 MAX	0.016048	0.052972	0.000068	0.0196636	0.023746527	NO
PISO2	157	COMDER2 MIN	-0.01605	-0.05297	-6.8E-05	0.0196636	0.023746527	NO
PISO1	157	COMDER1 MAX	0.0238	0.016592	0.000136	0.0249489	0.029248736	NO
PISO1	157	COMDER1 MIN	-0.0238	-0.01659	-0.00014	0.0249489	0.029248736	NO
PISO1	157	COMDER2 MAX	0.008908	0.03502	0.000068	0.0364001	0.044132383	NO
PISO1	157	COMDER2 MIN	-0.00891	-0.03502	-6.8E-05	0.0364001	0.044132383	NO
BASE	157	COMDER1 MAX	0	0	0			
BASE	157	COMDER1 MIN	0	0	0			
BASE	157	COMDER2 MAX	0	0	0			
BASE	157	COMDER2 MIN	0	0	0			

Story	Point	Load	UX	UY	UZ	D1	Irregularidad 1.2*(D1+D2)/2	D1>Irregularidad?
PISO2	162	COMDER1 MAX	0.059772	0.0238	0.000204	0.0181172	0.022011064	NO
PISO2	162	COMDER1 MIN	-0.05977	-0.0238	-0.0002	0.0181172	0.022011064	NO
PISO2	162	COMDER2 MAX	0.025704	0.05542	0.000204	0.0199139	0.023315151	NO

PISO2	162	COMDER2 MIN	-0.0257	-0.05542	-0.0002	0.0199139	0.023315151	NO
PISO1	162	COMDER1 MAX	0.03332	0.014892	0.000136	0.023799	0.029218291	NO
PISO1	162	COMDER1 MIN	-0.03332	-0.01489	-0.00014	0.023799	0.029218291	NO
PISO1	162	COMDER2 MAX	0.014552	0.036448	0.000136	0.0371539	0.043744797	NO
PISO1	162	COMDER2 MIN	-0.01455	-0.03645	-0.00014	0.0371539	0.043744797	NO
BASE	162	COMDER1 MAX	0	0	0			
BASE	162	COMDER1 MIN	0	0	0			
BASE	162	COMDER2 MAX	0	0	0			
BASE	162	COMDER2 MIN	0	0	0			

7.5.1 LONGITUD DE DESARROLLO

Para Fy= 420 Mpa

Para F'c= 21.1 Mpa

Barra No	Ldc (mm)	≥ 0.043 d_b F_y	Ldc + S
3	209	OK	279
4	279	OK	349
5	349	OK	419
6	420	OK	490
7	488	OK	558
8	558	OK	628

$$Ldc = \frac{0.24\ db\ Fy}{\lambda\sqrt{F'_c}} \geq 0.043\ d_b\ Fy$$

Numeral C.12.3.2 NSR-10

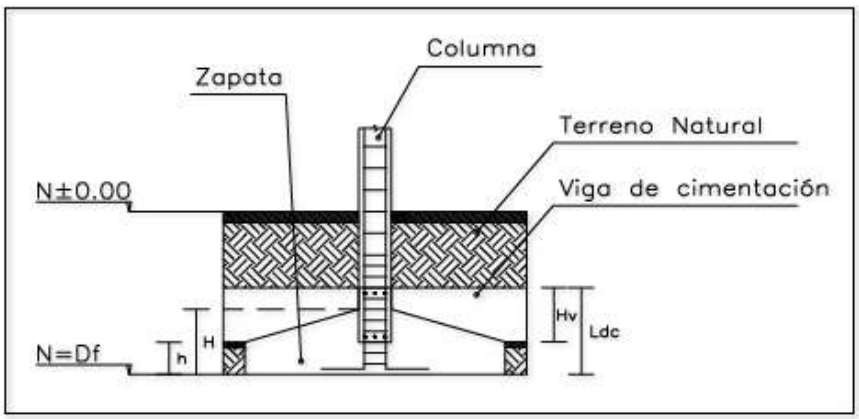
$$Ldc \geq 200\ mm$$

Donde: d_b : Diametro de la barra en mm

λ: 1.00 para concreto de peso normal (C.12.2.4) 1.00

La constante 0.043 esta en (mm²/N)

h=	0.30	m	Altura zapata
H=	Var.	m	Altura peralte zapata
Hv=	0.40	m	Altura viga de amarre
S =	0.07	m	Recubrimiento
Ldc=	0.63	m	Longitud de desarrollo (Altura de empotramiento de cada columna)



En el diseño de las columnas, el diametro mas grande que llega a cimentacion en las barras es de No 8 y su longitud de desarrollo minimo es de 0.63 m dando cumpliento a C.12.3.2

7.6 DISEÑO DE ELEMENTOS NO ESTRUCTURALES

Units: KN*m

STORY DATA

Story	Height	Elevation	SimilarTo
CUB2	0.45	10.12	None
CUB1	2.17	9.67	None
PISO2	3.50	7.50	None
PISO1	4.00	4.00	None
BASE	0.00	0.00	None

CENTER MASS RIGIDITY

Story	Diaphragm	MassX	MassY	XCM	YCM	CumMassX	CumMassY
PISO2	D1	45.2349	45.2349	4.704	12.068	45.2349	45.2349
PISO1	D1	249.6665	249.6665	4.096	11.66	294.9014	294.9014

XCCM	YCCM	XCR	YCR
4.704	12.068	4.796	12.47
4.189	11.723	4.771	12.592

STORY SHEARS

Story	Load	Loc	P	VX	VY	T	MX	MY
CUB2	SISDISX	Top	0	0.34	0.27	4.091	0	0
CUB2	SISDISX	Bottom	0	0.34	0.27	4.091	0.123	0.152
CUB2	SISDISY	Top	0	0.02	0.45	2.592	0	0
CUB2	SISDISY	Bottom	0	0.02	0.45	2.592	0.204	0.009
CUB1	SISDISX	Top	0	6.57	4.4	75.894	0.123	0.152
CUB1	SISDISX	Bottom	0	6.57	4.4	75.894	9.664	14.42
CUB1	SISDISY	Top	0	0.4	8.59	38.535	0.204	0.009
CUB1	SISDISY	Bottom	0	0.4	8.59	38.535	18.842	0.888
PISO2	SISDISX	Top	0	139.09	11.85	1552.564	9.664	14.42
PISO2	SISDISX	Bottom	0	139.09	11.85	1552.564	38.425	501.222
PISO2	SISDISY	Top	0	8.26	140.19	673.393	18.842	0.888
PISO2	SISDISY	Bottom	0	8.26	140.19	673.393	508.135	29.784
PISO1	SISDISX	Top	0	510.87	30.06	5579.941	38.425	501.222
PISO1	SISDISX	Bottom	0	510.87	30.06	5579.941	155.507	2517.75
PISO1	SISDISY	Top	0	30.06	605.67	2702.226	508.135	29.784
PISO1	SISDISY	Bottom	0	30.06	605.67	2702.226	2913.681	147.988

$$F_p = \frac{a_x a_p}{R_p} g M_p \geq \frac{A_a I}{2} g M_p \qquad a_x = \frac{C_{vx} V_s}{m_x g} \leq 2.5 a_a \qquad C_{vx} = \frac{m_x h_x^k}{\sum_{i=1}^{n} (m_i h_i^k)}$$

$$V_s = S_a g M$$

g: 9.81 m/s^2
Sa: 0.984 a

Grado de desempeño de los elementos no estructurales: SUPERIOR

ANALISIS DE CARGAS PARA MUROS

Espesor de muros:	0.15	m
Espesor de pañete en una cara:	0	m
Densidad de mamposteria:	13	kN/m3
Densidad mortero de pañete:	21	kN/m3
Altura Fachada:	3.20	m
Carga	6.24	kN/m
Descripción:	mamposteria reforzada, separada lateralmente de la estructura, apoyada arriba y abajo	
ap:	1.0	
Rp:	6	

ANALISIS DE CARGAS PARA ANTEPECHOS

Espesor de muros:	0.15	m
Espesor de pañete en una cara:	0	m
Densidad de mamposteria:	13	kN/m3
Densidad mortero de pañete:	21	kN/m3
Altura Antepecho:	1	m
Carga	1.95	kN/m
Descripción:	mamposteria reforzada, separada lateralmente de la estructura, apoyada solo abajo	
ap:	2.5	
Rp:	6	

Sección de vigas verticales: 0.15x0.25 m
f'c = 21.1 MPa
fy = 420 MPa

DISEÑO PARA MUROS

Story	Fx	Wx	ax	ap	Rp	Fp	M	V
PISO2	1.10	45.23	0.024	1.0	6	0.025	0.032	0.040
PISO1	94.80	249.67	0.380	1.0	6	0.395	0.505	0.632

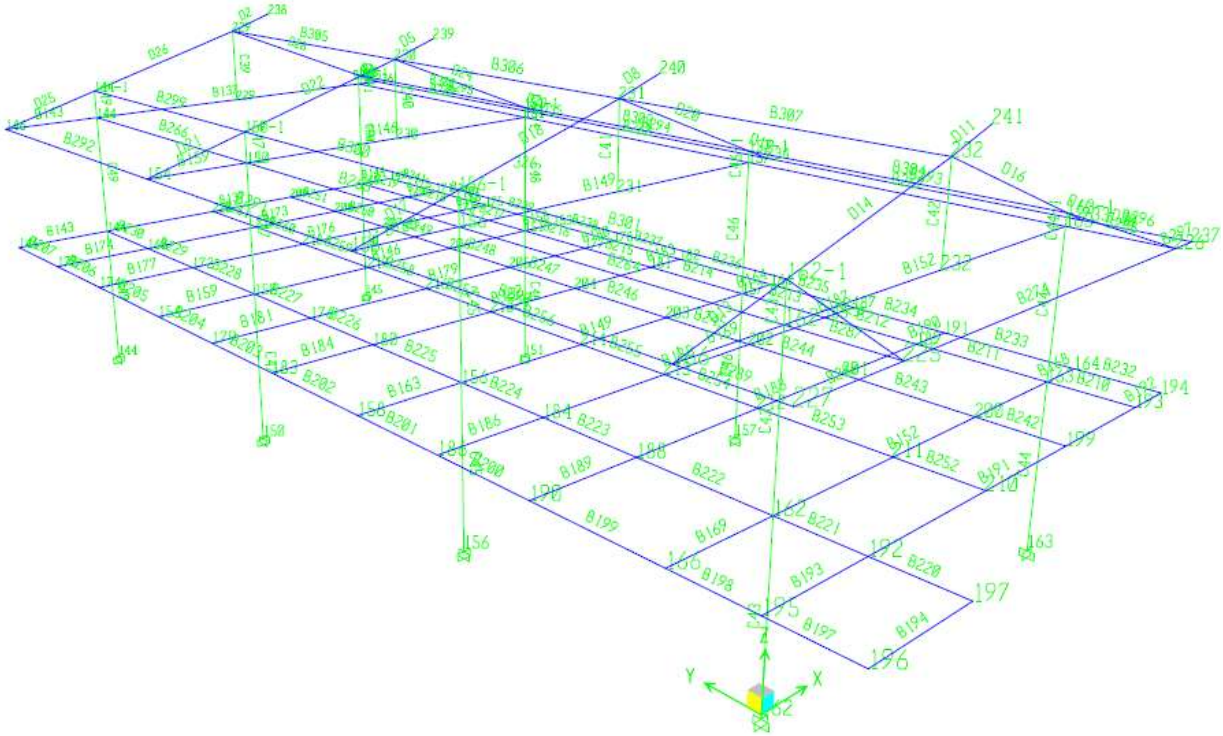
	Sección Vigas V.			As. (cm2)		Separación column.		Fl. 1/4"
Story	b	d	ρ	neces.	ubicado	S max	S escogida	S estribos
PISO2	0.15	0.21	0.00001	0.00	0.71	193.42	193.40	0.188
PISO1	0.15	0.21	0.00018	0.06	0.71	12.36	12.40	0.188

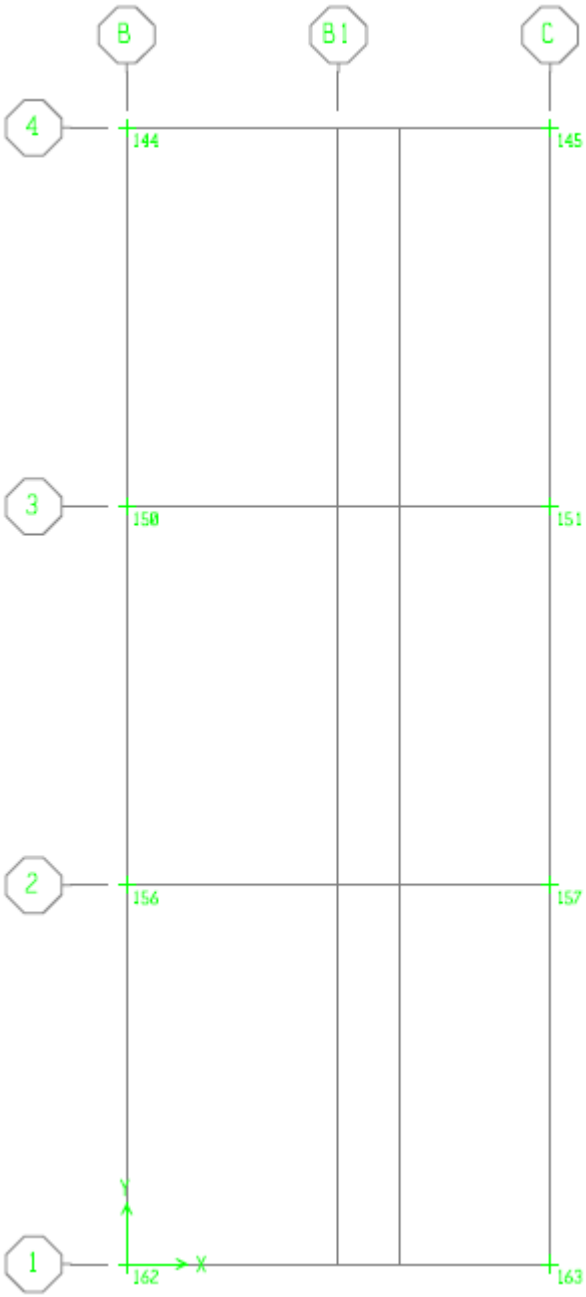
DISEÑO PARA ANTEPECHOS

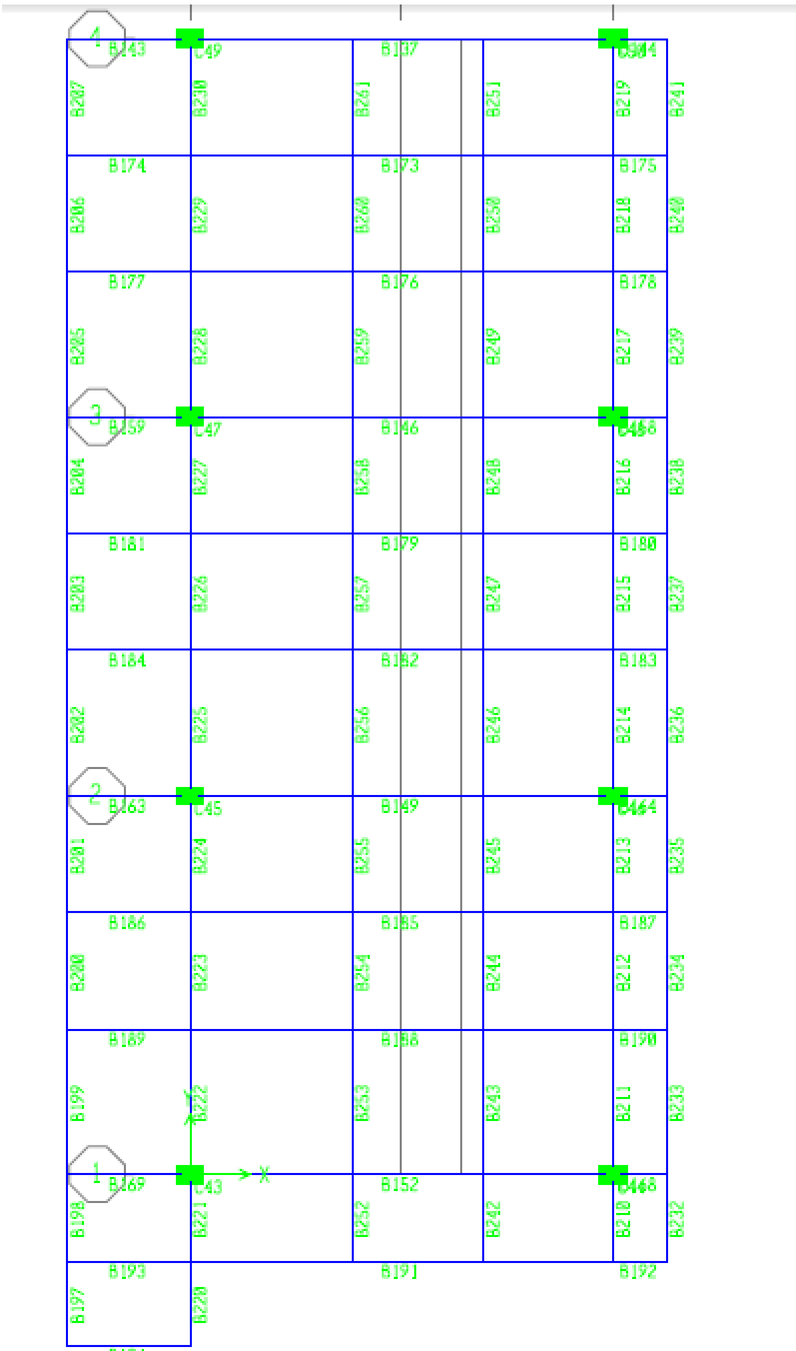
Story	Fx	Wx	ax	ap	Rp	Fp	M	V
PISO2	1.10	45.23	0.024	2.5	6	0.063	0.081	0.101
PISO1	94.80	249.67	0.380	2.5	6	0.987	1.264	1.580

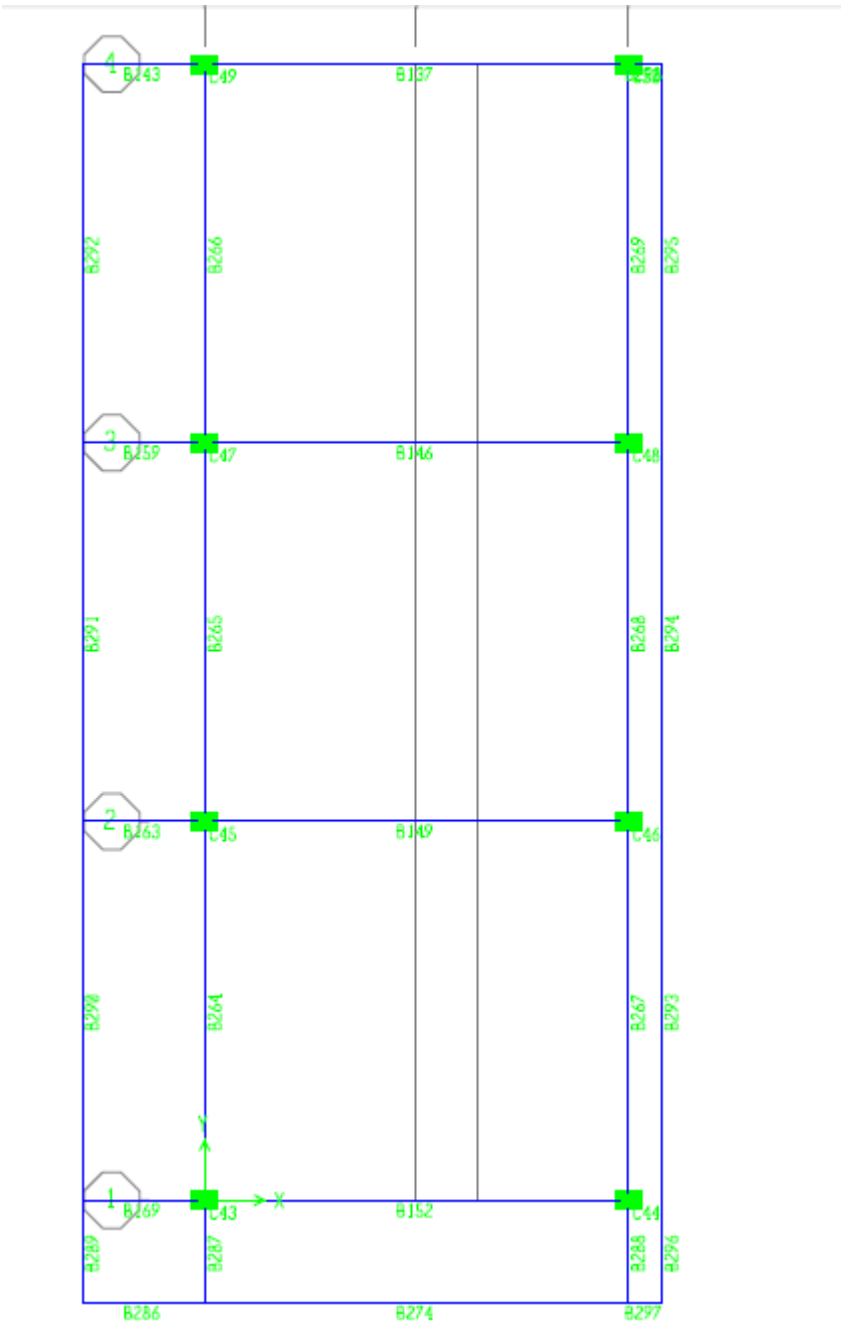
	Sección columneta			As. (cm2)		Separación column.		Fl. 1/4"
Story	b	d	ρ	neces.	ubicado	S max	S escogida	S estribos
PISO2	0.15	0.21	0.00003	0.01	1.29	140.54	140.50	0.188
PISO1	0.15	0.21	0.00046	0.14	1.29	8.96	9.00	0.188

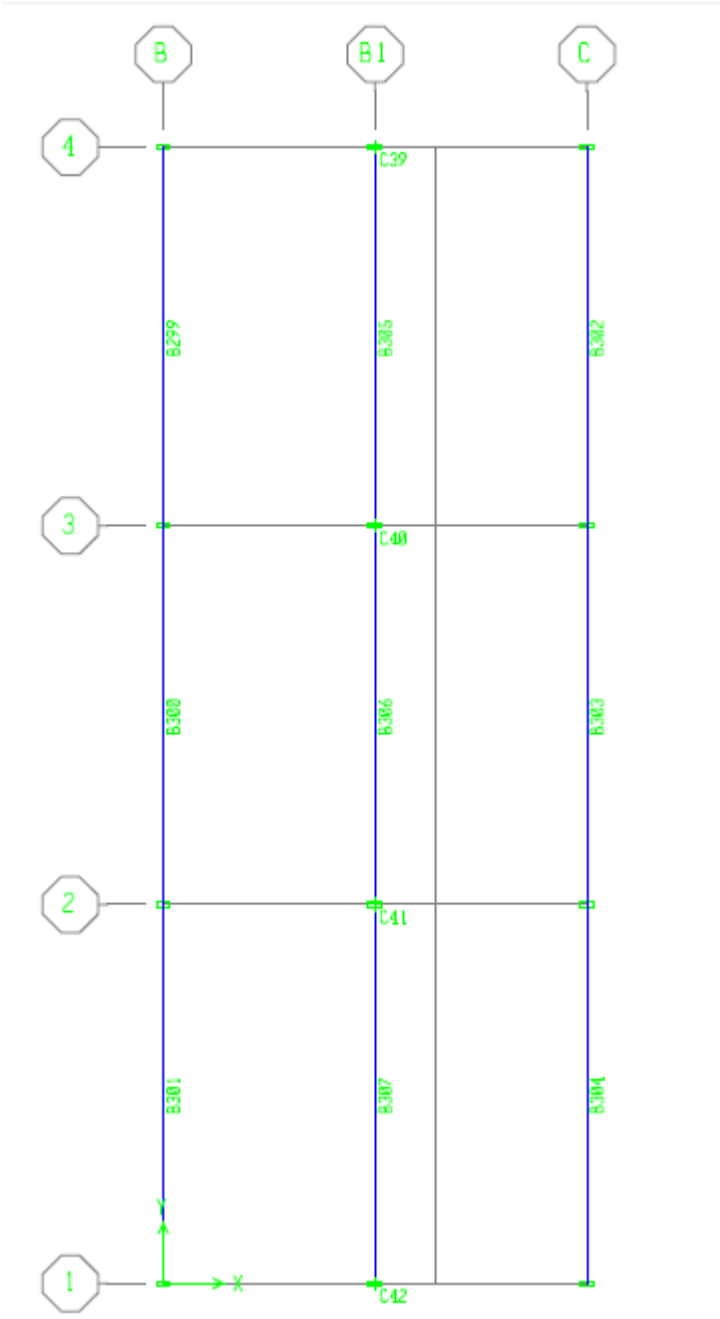
7.7 ANEXOS DE COMPUTADOR

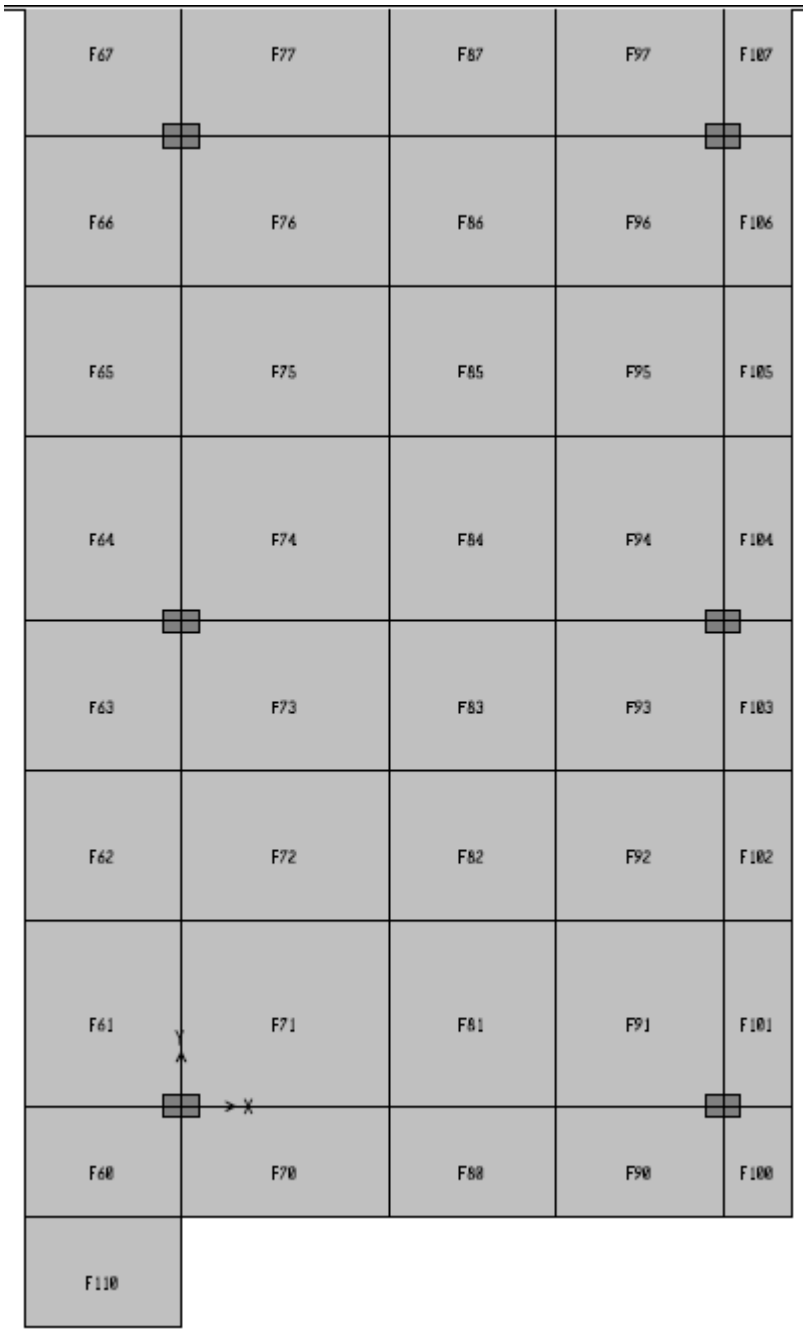


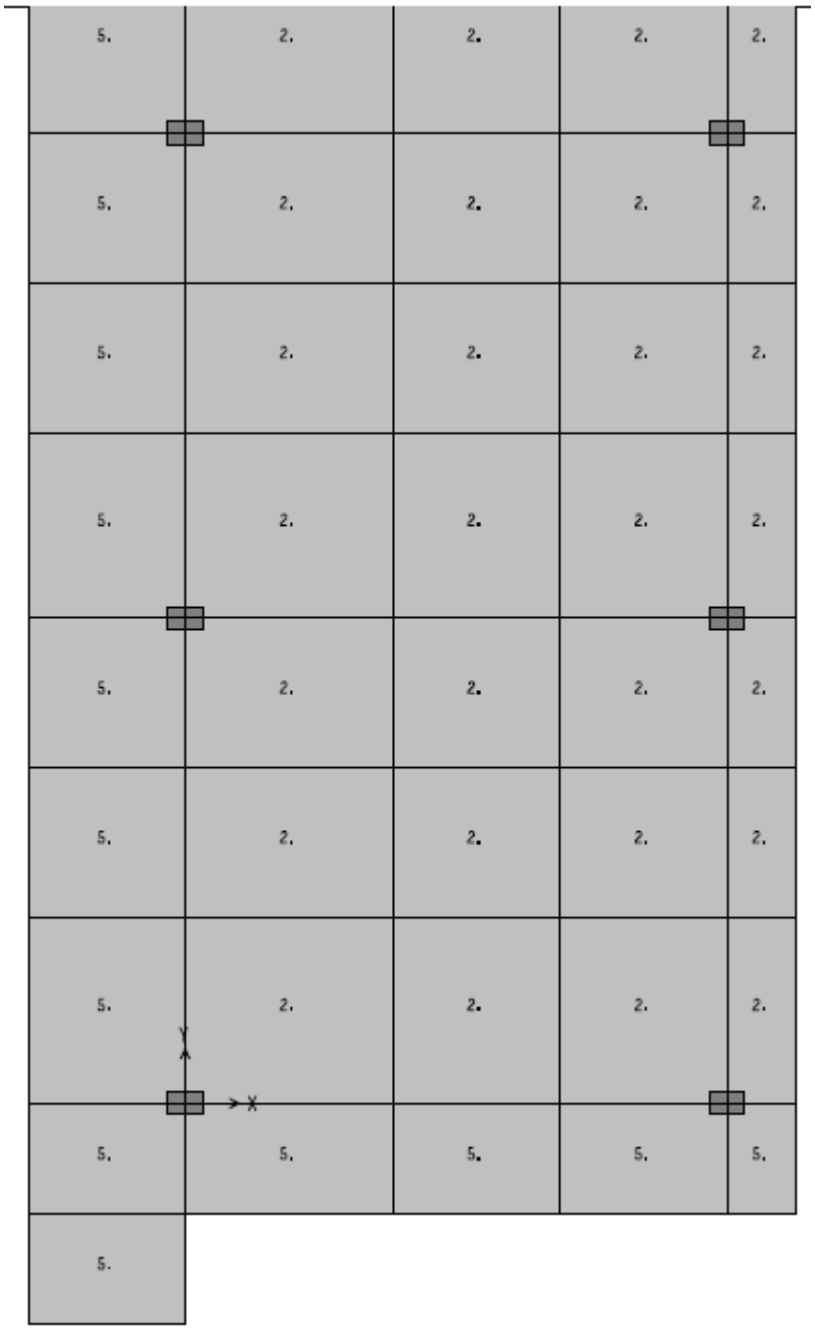

B
B1
C
4
3
2
1
144
145
150
151
156
157
162
163
Y
X


4
3
2
1
B143
C49
B137
B174
B173
B175
B177
B176
B178
B159
C47
B146
B181
B179
B180
B184
B182
B183
B163
C45
B149
B186
B185
B187
B189
B190
B169
C43
B152
B193
B191
B192
X
Y


4
3
2
1
B243
C49
B137
B292
B266
B269
B295
B259
C47
B146
C48
B291
B265
B268
B294
B263
C45
B149
C46
B290
B264
B267
B293
B269
C43
B152
C44
B289
B287
B288
B296
B286
B274
B297
Y
X


B
B1
C
4
3
2
1
C39
C40
C41
C42
B299
B300
B301
B305
B306
B307
B302
B303
B304
Y
X


F67
F77
F87
F97
F107
F66
F76
F86
F96
F106
F65
F75
F85
F95
F105
F64
F74
F84
F94
F104
F63
F73
F83
F93
F103
F62
F72
F82
F92
F102
F61
F71
F81
F91
F101
F60
F70
F80
F90
F100
F110
Y
X


5.
2.
Y
X

S T O R Y D A T A

STORY	SIMILAR TO	HEIGHT	ELEVATION
CUB2	None	0.450	10.120
CUB1	None	2.170	9.670
PISO2	None	3.500	7.500
PISO1	None	4.000	4.000
BASE	None		0.000

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P O I N T C O O R D I N A T E S

POINT	X	Y	DZ-BELOW
144	0.000	25.500	0.000
145	9.500	25.500	0.000
146	-2.750	25.500	0.000
149	10.700	25.500	0.000
150	0.000	17.000	0.000
151	9.500	17.000	0.000
153	10.700	17.000	0.000
154	-2.750	17.000	0.000
156	0.000	8.500	0.000
157	9.500	8.500	0.000
158	-2.750	8.500	0.000
161	10.700	8.500	0.000
162	0.000	0.000	0.000
163	9.500	0.000	0.000
164	10.700	0.000	0.000
166	-2.750	0.000	0.000
168	0.000	22.880	0.000
169	9.500	22.880	0.000
170	-2.750	22.880	0.000
171	10.700	22.880	0.000
172	0.000	20.260	0.000
173	9.500	20.260	0.000
174	-2.750	20.260	0.000
175	10.700	20.260	0.000
176	0.000	14.380	0.000
177	9.500	14.380	0.000
178	10.700	14.380	0.000
179	-2.750	14.380	0.000
180	0.000	11.760	0.000
181	9.500	11.760	0.000
182	10.700	11.760	0.000
183	-2.750	11.760	0.000
184	0.000	5.880	0.000
185	9.500	5.880	0.000
186	-2.750	5.880	0.000
187	10.700	5.880	0.000
188	0.000	3.260	0.000
189	9.500	3.260	0.000
190	-2.750	3.260	0.000
191	10.700	3.260	0.000
192	0.000	-1.950	0.000
193	9.500	-1.950	0.000
194	10.700	-1.950	0.000
195	-2.750	-1.950	0.000
196	-2.750	-3.850	0.000
197	0.000	-3.850	0.000
199	6.570	-1.950	0.000
200	6.570	0.000	0.000
201	6.570	3.260	0.000
202	6.570	5.880	0.000
203	6.570	8.500	0.000
204	6.570	11.760	0.000
205	6.570	14.380	0.000
206	6.570	17.000	0.000
207	6.570	20.260	0.000
208	6.570	22.880	0.000
209	6.570	25.500	0.000
210	3.640	-1.950	0.000
211	3.640	0.000	0.000
212	3.640	3.260	0.000
213	3.640	5.880	0.000
214	3.640	8.500	0.000

215	3.640	11.760	0.000
216	3.640	14.380	0.000
217	3.640	17.000	0.000
218	3.640	20.260	0.000
219	3.640	22.880	0.000
220	3.640	25.500	0.000
225	0.000	-2.300	0.000
226	9.500	-2.300	0.000
227	-2.750	-2.300	0.000
229	4.750	25.500	0.000
230	4.750	17.000	0.000
231	4.750	8.500	0.000
232	4.750	0.000	0.000
233	10.250	0.000	0.000
234	10.250	8.500	0.000
235	10.250	17.000	0.000
236	10.250	25.500	0.000
237	10.250	-2.300	0.000
238	6.100	25.500	0.000
239	6.100	17.000	0.000
240	6.100	8.500	0.000
241	6.100	0.000	0.000
162-1	0.000	0.000	1.374
163-1	9.500	0.000	1.874
156-1	0.000	8.500	1.374
157-1	9.500	8.500	1.874
150-1	0.000	17.000	1.374
151-1	9.500	17.000	1.874
144-1	0.000	25.500	1.374
145-1	9.500	25.500	1.874

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C O L U M N C O N N E C T I V I T Y D A T A

COLUMN	I END PT	J END PT	I END STORY
C39	229	229	Below
C40	230	230	Below
C41	231	231	Below
C42	232	232	Below
C43	162	162	Below
C44	163	163	Below
C43-1	162	162-1	Below
C44-1	163	163-1	Below
C45	156	156	Below
C46	157	157	Below
C45-1	156	156-1	Below
C46-1	157	157-1	Below
C47	150	150	Below
C48	151	151	Below
C47-1	150	150-1	Below
C48-1	151	151-1	Below
C49	144	144	Below
C50	145	145	Below
C49-1	144	144-1	Below
C50-1	145	145-1	Below

ETABS v9.7.4 File:COLEGIO SAN JUAN Units:KN-m Noviembre 28,

B E A M C O N N E C T I V I T Y D A T A

BEAM	I END PT	J END PT
B137	144	145
B143	146	144
B144	145	149
B146	150	151
B149	156	157
B152	162	163
B158	151	153
B159	154	150
B163	158	156
B164	157	161
B168	163	164
B169	166	162
B173	168	169
B174	170	168

B178	173	175
B179	176	177
B180	177	178
B181	179	176
B182	180	181
B183	181	182
B184	183	180
B185	184	185
B186	186	184
B187	185	187
B188	188	189
B189	190	188
B190	189	191
B191	192	193
B192	193	194
B193	195	192
B194	196	197
B197	196	195
B198	195	166
B199	166	190
B200	190	186
B201	186	158
B202	158	183
B203	183	179
B204	179	154
B205	154	174
B206	174	170
B207	170	146
B210	193	163
B211	163	189
B212	189	185
B213	185	157
B214	157	181
B215	181	177
B216	177	151
B217	151	173
B218	173	169
B219	169	145
B220	197	192
B221	192	162
B222	162	188
B223	188	184
B224	184	156
B225	156	180
B226	180	176
B227	176	150
B228	150	172
B229	172	168
B230	168	144
B232	194	164
B233	164	191
B234	191	187
B235	187	161
B236	161	182
B237	182	178
B238	178	153
B239	153	175
B240	175	171
B241	171	149
B242	199	200
B243	200	201
B244	201	202
B245	202	203
B246	203	204
B247	204	205
B248	205	206
B249	206	207
B250	207	208
B251	208	209
B252	210	211
B253	211	212
B254	212	213
B255	213	214
B256	214	215
B257	215	216
B258	216	217
B259	217	218
B260	218	219

B269	151	145
B274	225	226
B286	227	225
B287	225	162
B288	226	163
B289	227	166
B290	166	158
B291	158	154
B292	154	146
B293	233	234
B294	234	235
B295	235	236
B296	237	233
B297	226	237
B298	145	236
B299	144-1	150-1
B300	150-1	156-1
B301	156-1	162-1
B302	145-1	151-1
B303	151-1	157-1
B304	157-1	163-1
B305	229	230
B306	230	231
B307	231	232

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B R A C E C O N N E C T I V I T Y D A T A

BRACE	I END PT	J END PT	I END STORY
D2	229	238	Below
D5	230	239	Below
D8	231	240	Below
D11	232	241	Below
D13	166	162-1	Below
D14	162-1	232	Same
D15	233	163-1	Below
D16	163-1	232	Same
D17	158	156-1	Below
D18	156-1	231	Same
D19	234	157-1	Below
D20	157-1	231	Same
D21	154	150-1	Below
D22	150-1	230	Same
D23	235	151-1	Below
D24	151-1	230	Same
D25	146	144-1	Below
D26	144-1	229	Same
D27	236	145-1	Below
D28	145-1	229	Same
D29	225	162-1	Below
D30	226	163-1	Below

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R I G I D D I A P H R A G M P O I N T C O N N E C T I V I T Y D A T A

STORY	DIAPHRAGM	POINT	POINT	POINT	POINT	POINT
PISO2	D1	144	145	150	151	156
		157	162	163	146	154
		158	166	225	226	227
		229	230	231	232	233
		234	235	236	237	
PISO1	D1	144	145	146	149	150
		151	153	154	156	157
		158	161	162	163	164
		166	168	169	170	171
		172	173	174	175	176
		177	178	179	180	181
		182	183	184	185	186
		187	188	189	190	191
		192	193	194	195	196
		197	199	200	201	202
		203	204	205	206	207
		208	209	210	211	212

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

MATERIAL NAME	MATERIAL TYPE	DESIGN TYPE	MATERIAL DIR/PLANE	MODULUS OF ELASTICITY	POISSON'S RATIO	THERMAL COEFF	SHEAR MODULUS
STEEL	Iso	Steel	All	199900000.00	0.3000	1.1700E-05	76884615.38
CONC21	Iso	Concrete	All	21538110.000	0.2000	9.9000E-06	8974212.500
OTHER	Iso	None	All	199947978.80	0.3000	1.1700E-05	76903068.77
A500	Iso	Steel	All	199900000.00	0.3000	1.1700E-05	76884615.38
SINPESO	Iso	None	All	0.000	0.3000	1.1700E-05	0.000

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

MATERIAL NAME	MASS PER UNIT VOL	WEIGHT PER UNIT VOL
STEEL	7.8271E+00	7.6820E+01
CONC21	2.4000E+00	2.4000E+01
OTHER	7.8271E+00	7.6820E+01
A500	7.8271E+00	7.6820E+01
SINPESO	2.4000E+00	0.0000E+00

M A T E R I A L D E S I G N D A T A F O R S T E E L M A T E R I A L S

MATERIAL NAME	STEEL FY	STEEL FU	STEEL COST ($)
STEEL	344737.890	448159.260	271447.16
A500	352000.000	400000.000	5000.00

M A T E R I A L D E S I G N D A T A F O R C O N C R E T E M A T E R I A L S

MATERIAL NAME	LIGHTWEIGHT CONCRETE	CONCRETE FC	REBAR FY	REBAR FYS	LIGHTWT REDUC FACT
CONC21	No	21000.000	420000.000	420000.000	N/A

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F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	MATERIAL NAME	SECTION SHAPE NAME OR NAME IN SECTION DATABASE FILE	CONC COL	CONC BEAM
VIG50X45	CONC21	Rectangular		Yes
COL.60X40	CONC21	Rectangular	Yes	
TUBO305X100	A500	Box/Tube		
VIG20X45	CONC21	Rectangular		Yes
VIG30X45	CONC21	Rectangular		Yes

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	SECTION DEPTH	FLANGE WIDTH TOP	FLANGE THICK TOP	WEB THICK	FLANGE WIDTH BOT	FLANGE THICK BOT
VIG50X45	0.4500	0.5000	0.0000	0.0000	0.0000	0.0000
COL.60X40	0.6000	0.4000	0.0000	0.0000	0.0000	0.0000
TUBO305X100	0.3050	0.1000	0.0064	0.0064	0.0000	0.0000
VIG20X45	0.4500	0.2000	0.0000	0.0000	0.0000	0.0000
VIG30X45	0.4500	0.3000	0.0000	0.0000	0.0000	0.0000

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	SECTION AREA	TORSIONAL CONSTANT	MOMENTS OF INERTIA I33	MOMENTS OF INERTIA I22	SHEAR AREAS A2	SHEAR AREAS A3
VIG50X45	0.2250	0.0070	0.0038	0.0047	0.1875	0.1875
COL.60X40	0.2400	0.0075	0.0072	0.0032	0.2000	0.2000
TUBO305X100	0.0050	0.0000	0.0001	0.0000	0.0039	0.0013
VIG20X45	0.0900	0.0009	0.0015	0.0003	0.0750	0.0750

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	SECTION MODULI S33	SECTION MODULI S22	PLASTIC MODULI Z33	PLASTIC MODULI Z22	RADIUS OF GYRATION R33	RADIUS OF GYRATION R22
VIG50X45	0.0169	0.0188	0.0253	0.0281	0.1299	0.1443
COL.60X40	0.0240	0.0160	0.0360	0.0240	0.1732	0.1155
TUBO305X100	0.0004	0.0002	0.0005	0.0002	0.1048	0.0430
VIG20X45	0.0068	0.0030	0.0101	0.0045	0.1299	0.0577
VIG30X45	0.0101	0.0068	0.0152	0.0101	0.1299	0.0866

F R A M E S E C T I O N W E I G H T S A N D M A S S E S

FRAME SECTION NAME	TOTAL WEIGHT	TOTAL MASS
VIG50X45	609.6600	60.9660
COL.60X40	345.6000	34.5600
TUBO305X100	90.9070	9.2625
VIG20X45	450.5760	45.0576
VIG30X45	288.3600	28.8360

C O N C R E T E C O L U M N D A T A

FRAME SECTION NAME	REINF CONFIGURATION LONGIT	REINF CONFIGURATION LATERAL	REINF SIZE/TYPE	NUM BARS 3DIR/2DIR	NUM BARS CIRCULAR	BAR COVER
COL.60X40	Rectangular	Ties	#8/Design	5/5	N/A	0.0500

C O N C R E T E B E A M D A T A

FRAME SECTION NAME	TOP COVER	BOT COVER	TOP LEFT AREA	TOP RIGHT AREA	BOT LEFT AREA	BOT RIGHT AREA
VIG50X45	0.0500	0.0500	0.000	0.000	0.000	0.000
VIG20X45	0.0500	0.0500	0.000	0.000	0.000	0.000
VIG30X45	0.0500	0.0500	0.000	0.000	0.000	0.000

S H E L L S E C T I O N P R O P E R T Y D A T A

SHELL SECTION	MATERIAL NAME	SHELL TYPE	LOAD DIST ONE WAY	MEMBRANE THICK	BENDING THICK	TOTAL WEIGHT	TOTAL MASS
MACIZA	CONC21	Membrane	No	0.1420	0.1420	1276.0489	127.6049
LIVIANA	SINPESO	Membrane	No	0.0170	0.0170	0.0000	15.7550

S T A T I C L O A D C A S E S

STATIC CASE	CASE TYPE	AUTO LAT LOAD	SELF WT MULTIPLIER	NOTIONAL FACTOR	NOTIONAL DIRECTION
DEAD	DEAD	N/A	1.0000		
LIVE	LIVE	N/A	0.0000		

R E S P O N S E S P E C T R U M C A S E S

RESP SPEC CASE: SISDISX

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

U1	DISENO	12.3600
U2	----	N/A
U3	----	N/A

RESP SPEC CASE: SISDISY

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	DISENO	10.8000
U3	----	N/A

RESP SPEC CASE: SISDERX

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	DERIVAS	12.3600
U2	----	N/A
U3	----	N/A

RESP SPEC CASE: SISDERY

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	DERIVAS	10.8000
U3	----	N/A

RESP SPEC CASE: SISUMBX

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	UMBRAL	19.2500
U2	----	N/A

RESP SPEC CASE: SISUMMY

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	IMBRAL	16.7000
U3	----	N/A

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L O A D I N G C O M B I N A T I O N S

COMBO	COMBO TYPE	CASE	CASE TYPE	SCALE FACTOR
COMDIS1	ADD	DEAD	Static	1.4000
COMDIS2	ADD	DEAD	Static	1.2000
		LIVE	Static	1.6000
COMDIS3	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISDISX	Spectra	1.0000
		SISDISY	Spectra	0.3000
COMDIS4	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISDISY	Spectra	1.0000
		SISDISX	Spectra	0.3000
COMDIS5	ADD	DEAD	Static	0.9000
		SISDISX	Spectra	1.0000
		SISDISY	Spectra	0.3000
COMDIS6	ADD	DEAD	Static	0.9000
		SISDISY	Spectra	1.0000
		SISDISX	Spectra	0.3000
ENVOLVENTE	ENVE	COMDIS1	Combo	1.0000
		COMDIS2	Combo	1.0000
		COMDIS3	Combo	1.0000
		COMDIS4	Combo	1.0000
		COMDIS5	Combo	1.0000
		COMDIS6	Combo	1.0000
CIM1	ADD	DEAD	Static	1.0000
		LIVE	Static	1.0000
CIM2	ADD	DEAD	Static	1.0000
		LIVE	Static	0.7500
		SISDISX	Spectra	0.1400
		SISDISY	Spectra	0.0466
CIM3	ADD	DEAD	Static	1.0000
		LIVE	Static	0.7500
		SISDISY	Spectra	0.1400
		SISDISX	Spectra	0.0466
COMDER1	ADD	SISDERX	Spectra	1.0000
		SISDERY	Spectra	0.3000
COMDER2	ADD	SISDERY	Spectra	1.0000
		SISDERX	Spectra	0.3000
COMDERDM1	ADD	SISUMMX	Spectra	1.0000
		SISUMMY	Spectra	0.3000
COMDERDM2	ADD	SISUMMY	Spectra	1.0000
		SISUMMX	Spectra	0.3000
SISMOX2	ADD	SISDISX	Spectra	-1.0000
SISMOY2	ADD	SISDISY	Spectra	-1.0000
DSTLS1	ADD	DEAD	Static	1.4000
DSTLS2	ADD	DEAD	Static	1.2000
		LIVE	Static	1.6000
DSTLS3	ADD	DEAD	Static	1.4000
		LIVE	Static	0.5000
		SISDISX	Spectra	1.5000
DSTLS4	ADD	DEAD	Static	1.4000
		LIVE	Static	0.5000
		SISDISY	Spectra	1.5000
DSTLS5	ADD	DEAD	Static	1.4000

DETLS6	ADD	DEAD	Static	1.4000
		LIVE	Static	0.5000
		SISDERY	Spectra	1.5000
DETLS7	ADD	DEAD	Static	1.4000
		LIVE	Static	0.5000
		SISUMBX	Spectra	1.5000
DETLS8	ADD	DEAD	Static	1.4000
		LIVE	Static	0.5000
		SISUMBY	Spectra	1.5000
DETLS9	ADD	DEAD	Static	0.7000
		SISDISX	Spectra	1.5000
DETLS10	ADD	DEAD	Static	0.7000
		SISDISY	Spectra	1.5000
DETLS11	ADD	DEAD	Static	0.7000
		SISDERX	Spectra	1.5000
DETLS12	ADD	DEAD	Static	0.7000
		SISDERY	Spectra	1.5000
DETLS13	ADD	DEAD	Static	0.7000
		SISUMBX	Spectra	1.5000
DETLS14	ADD	DEAD	Static	0.7000
		SISUMBY	Spectra	1.5000
DETLD1	ADD	DEAD	Static	1.0000
DETLD2	ADD	DEAD	Static	1.0000
		LIVE	Static	1.0000

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R E S P O N S E S P E C T R U M F U N C T I O N - F R O M F I L E

FUNCTION NAME: DERIVAS

FILE NAME: c:\users\diseños y estructura\desktop\ing. daniel rojas\dye16-2282-1.e sixto maria\memorias\derivas.txt
DATA TYPE: Period vs Acceleration
NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	1.1330
0.0500	1.1330
0.1000	1.1330
0.1600	1.1330
0.2100	1.1330
0.4000	1.1330
0.6000	1.1330
0.8000	1.1330
0.9900	1.1330
1.3400	0.8410
1.6800	0.6690
2.0300	0.5550
2.3700	0.4740
2.7200	0.4140
3.0600	0.3670
3.4100	0.3300
3.7500	0.3000
4.1000	0.2750
4.4400	0.2530
4.7900	0.2350
5.1300	0.2190
5.4800	0.2050
5.8200	0.1930
6.1700	0.1820
6.5100	0.1730
6.8600	0.1640
7.2000	0.1560
8.2000	0.1200
9.2000	0.0960

FUNCTION NAME: DISENO

FILE NAME: c:\users\diseños y estructura\desktop\ing. daniel rojas\dye16-2282-1.e sixto maria\memorias\diseño.txt
DATA TYPE: Period vs Acceleration
NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	0.2160

2.0300	0.1060
2.3700	0.0900
2.7200	0.0790
3.0600	0.0700
3.4100	0.0630
3.7500	0.0570
4.1000	0.0520
4.4400	0.0480
4.7900	0.0450
5.1300	0.0420
5.4800	0.0390
5.8200	0.0370
6.1700	0.0350
6.5100	0.0330
6.8600	0.0310
7.2000	0.0300
8.2000	0.0230
9.2000	0.0180

FUNCTION NAME: UMBRAL

FILE NAME: c:\users\diseños y estructura\desktop\ing. daniel rojas\dye16-2282-i.e sixto maria\memorias\umbral.txt
DATA TYPE: Period vs Acceleration
NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	0.2700
0.0500	0.3780
0.1000	0.4860
0.1500	0.5940
0.2000	0.7020
0.2500	0.8100
0.4500	0.8100
0.6500	0.8100
0.8600	0.8100
1.0600	0.8100
1.2600	0.8100
1.4600	0.8100
1.6700	0.8100
1.8700	0.8100
2.4900	0.6090
3.1000	0.4880
3.7200	0.4070
4.3300	0.3490
4.9500	0.3060
5.5700	0.2720
6.1800	0.2450
6.8000	0.2230
7.4200	0.2040
8.0300	0.1880
8.6500	0.1750
9.2700	0.1630
9.8800	0.1530
10.5000	0.1230
11.5000	0.1030
12.5000	0.0870

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F R A M E S E C T I O N A S S I G N M E N T S T O L I N E O B J E C T S

STORY LEVEL	LINE ID	LINE TYPE	SECTION TYPE	AUTO SELECT SECTION	ANALYSIS SECTION	DESIGN PROCEDURE	DESIGN SECTION
CUB1	C39	Column	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	C40	Column	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	C41	Column	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	C42	Column	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100

CUB1	C44-1	Column	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	C45-1	Column	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	C46-1	Column	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	C47-1	Column	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	C48-1	Column	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	C49-1	Column	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	C50-1	Column	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	C43	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO2	C44	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO2	C45	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO2	C46	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO2	C47	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO2	C48	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO2	C49	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO2	C50	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO1	C43	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO1	C44	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO1	C45	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO1	C46	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO1	C47	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO1	C48	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO1	C49	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
PISO1	C50	Column	Rectangular	None	COL.60X40	Conc Frame	COL.60X40
CUB1	B299	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	B300	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	B301	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	B302	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	B303	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	B304	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	B305	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	B306	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
CUB1	B307	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B137	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
PISO2	B143	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B146	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
PISO2	B149	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
PISO2	B152	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
PISO2	B159	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B163	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B169	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B264	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
PISO2	B265	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
PISO2	B266	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
PISO2	B267	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
PISO2	B268	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
PISO2	B269	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
PISO2	B274	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B286	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B287	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B288	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO2	B289	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B290	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B291	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B292	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B293	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B294	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B295	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B296	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B297	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO2	B298	Beam	Box/Tube	None	TUBO305X100	Steel Frame	TUBO305X100
PISO1	B137	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B143	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B144	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B146	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B149	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B152	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B158	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B159	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B163	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B164	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B168	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45

PISO1	B182	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B183	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B184	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B185	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B186	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B187	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B188	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B189	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B190	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B191	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B192	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B193	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B194	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B197	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B198	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B199	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B200	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B201	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B202	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B203	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B204	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B205	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B206	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B207	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B210	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B211	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B212	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B213	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B214	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B215	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B216	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B217	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B218	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B219	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B220	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B221	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B222	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B223	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B224	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B225	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B226	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B227	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B228	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B229	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B230	Beam	Rectangular	None	VIG50X45	Conc Frame	VIG50X45
PISO1	B232	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B233	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B234	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B235	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B236	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B237	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B238	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B239	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B240	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B241	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B242	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B243	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B244	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B245	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B246	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B247	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B248	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B249	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B250	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B251	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B252	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B253	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B254	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B255	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B256	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
PISO1	B257	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45

CUB1	D14	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D15	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D16	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D17	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D18	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D19	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D20	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D21	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D22	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D23	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D24	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D25	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D26	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D27	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D28	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D29	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100
CUB1	D30	Brace	Box/Tube	None	TUBO305X100 Steel Frame TUBO305X100

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D I S T R I B U T E D L O A D A S S I G N M E N T S T O L I N E O B J E C T S

LOAD CASE	STORY LEVEL	LINE ID	LOAD TYPE	LOAD DIRECTION	ABSOLUTE DISTANCE A	ABSOLUTE DISTANCE B	LOAD A PER LENGTH	LOAD B PER LENGTH
DEAD	PISO2	B143	Force	Gravity	0.000	2.750	2.000	2.000
DEAD	PISO2	B159	Force	Gravity	0.000	2.750	2.000	2.000
DEAD	PISO2	B163	Force	Gravity	0.000	2.750	2.000	2.000
DEAD	PISO2	B169	Force	Gravity	0.000	2.750	2.000	2.000
DEAD	PISO2	B274	Force	Gravity	0.000	9.500	2.000	2.000
DEAD	PISO2	B286	Force	Gravity	0.000	2.750	2.000	2.000
DEAD	PISO2	B287	Force	Gravity	0.000	2.300	2.000	2.000
DEAD	PISO2	B289	Force	Gravity	0.000	2.300	2.000	2.000
DEAD	PISO2	B290	Force	Gravity	0.000	8.500	2.000	2.000
DEAD	PISO2	B291	Force	Gravity	0.000	8.500	2.000	2.000
DEAD	PISO2	B292	Force	Gravity	0.000	8.500	2.000	2.000
DEAD	PISO2	B293	Force	Gravity	0.000	8.500	2.000	2.000
DEAD	PISO2	B294	Force	Gravity	0.000	8.500	2.000	2.000
DEAD	PISO2	B295	Force	Gravity	0.000	8.500	2.000	2.000
DEAD	PISO2	B296	Force	Gravity	0.000	2.300	2.000	2.000
DEAD	PISO2	B297	Force	Gravity	0.000	0.750	2.000	2.000
DEAD	PISO2	B298	Force	Gravity	0.000	0.750	2.000	2.000
LIVE	PISO2	B143	Force	Gravity	0.000	2.750	2.000	2.000
LIVE	PISO2	B159	Force	Gravity	0.000	2.750	2.000	2.000
LIVE	PISO2	B163	Force	Gravity	0.000	2.750	2.000	2.000
LIVE	PISO2	B169	Force	Gravity	0.000	2.750	2.000	2.000
LIVE	PISO2	B274	Force	Gravity	0.000	9.500	2.000	2.000
LIVE	PISO2	B286	Force	Gravity	0.000	2.750	2.000	2.000
LIVE	PISO2	B287	Force	Gravity	0.000	2.300	2.000	2.000
LIVE	PISO2	B289	Force	Gravity	0.000	2.300	2.000	2.000
LIVE	PISO2	B290	Force	Gravity	0.000	8.500	2.000	2.000
LIVE	PISO2	B291	Force	Gravity	0.000	8.500	2.000	2.000
LIVE	PISO2	B292	Force	Gravity	0.000	8.500	2.000	2.000
LIVE	PISO2	B293	Force	Gravity	0.000	8.500	2.000	2.000
LIVE	PISO2	B294	Force	Gravity	0.000	8.500	2.000	2.000
LIVE	PISO2	B295	Force	Gravity	0.000	8.500	2.000	2.000
LIVE	PISO2	B296	Force	Gravity	0.000	2.300	2.000	2.000
LIVE	PISO2	B297	Force	Gravity	0.000	0.750	2.000	2.000
LIVE	PISO2	B298	Force	Gravity	0.000	0.750	2.000	2.000
DEAD	CUB2	D2	Force	Gravity	0.000	1.423	2.000	2.000
DEAD	CUB2	D5	Force	Gravity	0.000	1.423	2.000	2.000
DEAD	CUB2	D8	Force	Gravity	0.000	1.423	2.000	2.000
DEAD	CUB2	D11	Force	Gravity	0.000	1.423	2.000	2.000
DEAD	CUB1	D13	Force	Gravity	0.000	2.863	2.000	2.000
DEAD	CUB1	D14	Force	Gravity	0.000	4.945	2.000	2.000
DEAD	CUB1	D15	Force	Gravity	0.000	0.806	2.000	2.000
DEAD	CUB1	D16	Force	Gravity	0.000	5.106	2.000	2.000
DEAD	CUB1	D17	Force	Gravity	0.000	2.863	2.000	2.000
DEAD	CUB1	D18	Force	Gravity	0.000	4.945	2.000	2.000
DEAD	CUB1	D19	Force	Gravity	0.000	0.806	2.000	2.000
DEAD	CUB1	D20	Force	Gravity	0.000	5.106	2.000	2.000

LIVE	CUB2	D8	Force	Gravity	0.000	1.423	2.000	2.000
LIVE	CUB2	D11	Force	Gravity	0.000	1.423	2.000	2.000
LIVE	CUB1	D13	Force	Gravity	0.000	2.863	2.000	2.000
LIVE	CUB1	D14	Force	Gravity	0.000	4.945	2.000	2.000
LIVE	CUB1	D15	Force	Gravity	0.000	0.806	2.000	2.000
LIVE	CUB1	D16	Force	Gravity	0.000	5.106	2.000	2.000
LIVE	CUB1	D17	Force	Gravity	0.000	2.863	2.000	2.000
LIVE	CUB1	D18	Force	Gravity	0.000	4.945	2.000	2.000
LIVE	CUB1	D19	Force	Gravity	0.000	0.806	2.000	2.000
LIVE	CUB1	D20	Force	Gravity	0.000	5.106	2.000	2.000
LIVE	CUB1	D21	Force	Gravity	0.000	2.863	2.000	2.000
LIVE	CUB1	D22	Force	Gravity	0.000	4.945	2.000	2.000
LIVE	CUB1	D23	Force	Gravity	0.000	0.806	2.000	2.000
LIVE	CUB1	D24	Force	Gravity	0.000	5.106	2.000	2.000
LIVE	CUB1	D25	Force	Gravity	0.000	2.863	2.000	2.000
LIVE	CUB1	D26	Force	Gravity	0.000	4.945	2.000	2.000
LIVE	CUB1	D27	Force	Gravity	0.000	0.806	2.000	2.000
LIVE	CUB1	D28	Force	Gravity	0.000	5.106	2.000	2.000

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U N I F O R M L O A D A S S I G N M E N T S T O A R E A O B J E C T S

CASE	STORY	AREA	AREATYPE	DIRECTION	LOAD
LIVE	PISO1	F60	Floor	Gravity	5.0000
LIVE	PISO1	F61	Floor	Gravity	5.0000
LIVE	PISO1	F62	Floor	Gravity	5.0000
LIVE	PISO1	F63	Floor	Gravity	5.0000
LIVE	PISO1	F64	Floor	Gravity	5.0000
LIVE	PISO1	F65	Floor	Gravity	5.0000
LIVE	PISO1	F66	Floor	Gravity	5.0000
LIVE	PISO1	F67	Floor	Gravity	5.0000
LIVE	PISO1	F68	Floor	Gravity	5.0000
LIVE	PISO1	F69	Floor	Gravity	5.0000
LIVE	PISO1	F70	Floor	Gravity	5.0000
LIVE	PISO1	F71	Floor	Gravity	2.0000
LIVE	PISO1	F72	Floor	Gravity	2.0000
LIVE	PISO1	F73	Floor	Gravity	2.0000
LIVE	PISO1	F74	Floor	Gravity	2.0000
LIVE	PISO1	F75	Floor	Gravity	2.0000
LIVE	PISO1	F76	Floor	Gravity	2.0000
LIVE	PISO1	F77	Floor	Gravity	2.0000
LIVE	PISO1	F78	Floor	Gravity	2.0000
LIVE	PISO1	F79	Floor	Gravity	2.0000
LIVE	PISO1	F80	Floor	Gravity	5.0000
LIVE	PISO1	F81	Floor	Gravity	2.0000
LIVE	PISO1	F82	Floor	Gravity	2.0000
LIVE	PISO1	F83	Floor	Gravity	2.0000
LIVE	PISO1	F84	Floor	Gravity	2.0000
LIVE	PISO1	F85	Floor	Gravity	2.0000
LIVE	PISO1	F86	Floor	Gravity	2.0000
LIVE	PISO1	F87	Floor	Gravity	2.0000
LIVE	PISO1	F88	Floor	Gravity	2.0000
LIVE	PISO1	F89	Floor	Gravity	2.0000
LIVE	PISO1	F90	Floor	Gravity	5.0000
LIVE	PISO1	F91	Floor	Gravity	2.0000
LIVE	PISO1	F92	Floor	Gravity	2.0000
LIVE	PISO1	F93	Floor	Gravity	2.0000
LIVE	PISO1	F94	Floor	Gravity	2.0000
LIVE	PISO1	F95	Floor	Gravity	2.0000
LIVE	PISO1	F96	Floor	Gravity	2.0000
LIVE	PISO1	F97	Floor	Gravity	2.0000
LIVE	PISO1	F98	Floor	Gravity	2.0000
LIVE	PISO1	F99	Floor	Gravity	2.0000
LIVE	PISO1	F100	Floor	Gravity	5.0000
LIVE	PISO1	F101	Floor	Gravity	2.0000
LIVE	PISO1	F102	Floor	Gravity	2.0000
LIVE	PISO1	F103	Floor	Gravity	2.0000
LIVE	PISO1	F104	Floor	Gravity	2.0000

7.8 DATOS DE SALIDA

Story	Beam	Load	Loc	P	V2	V3	T	M2	M3
PISO2	B137	ENVOLVENTE MAX	0	0	-10.04	0	2.318	0	-6.37
PISO2	B137	ENVOLVENTE MAX	4.75	0	3.81	0	2.318	0	47.929
PISO2	B137	ENVOLVENTE MAX	4.75	0	5.37	0	1.893	0	26.158
PISO2	B137	ENVOLVENTE MAX	9.5	0	23.84	0	1.893	0	19.136
PISO2	B137	ENVOLVENTE MIN	0	0	-44.04	0	-1.29	0	-118.047
PISO2	B137	ENVOLVENTE MIN	4.75	0	-25.58	0	-1.29	0	8.407
PISO2	B137	ENVOLVENTE MIN	4.75	0	-9.57	0	-1.097	0	6.569
PISO2	B137	ENVOLVENTE MIN	9.5	0	4.28	0	-1.097	0	-46.322
PISO1	B137	ENVOLVENTE MAX	0	0	-48.45	0	61.198	0	-57.078
PISO1	B137	ENVOLVENTE MAX	3.64	0	-21.4	0	61.198	0	157.5
PISO1	B137	ENVOLVENTE MAX	3.64	0	3.71	0	1.373	0	157.65
PISO1	B137	ENVOLVENTE MAX	4.75	0	11	0	1.373	0	171.996
PISO1	B137	ENVOLVENTE MAX	6.57	0	34.76	0	1.373	0	147.928
PISO1	B137	ENVOLVENTE MAX	6.57	0	104.64	0	-7.75	0	143.848
PISO1	B137	ENVOLVENTE MAX	9.5	0	149.28	0	-7.75	0	-16.014
PISO1	B137	ENVOLVENTE MIN	0	0	-165.3	0	3.07	0	-337.597
PISO1	B137	ENVOLVENTE MIN	3.64	0	-104.81	0	3.07	0	41.721
PISO1	B137	ENVOLVENTE MIN	3.64	0	-29.53	0	-14.816	0	40.807
PISO1	B137	ENVOLVENTE MIN	4.75	0	-16.74	0	-14.816	0	60.458
PISO1	B137	ENVOLVENTE MIN	6.57	0	-1.56	0	-14.816	0	29.502
PISO1	B137	ENVOLVENTE MIN	6.57	0	20.45	0	-77.239	0	29.102
PISO1	B137	ENVOLVENTE MIN	9.5	0	41.2	0	-77.239	0	-254.444
PISO2	B143	ENVOLVENTE MAX	0	0	3.41	0	-1.092	0	3.981
PISO2	B143	ENVOLVENTE MAX	1.375	0	10.09	0	-1.092	0	-1.1
PISO2	B143	ENVOLVENTE MAX	2.75	0	18.26	0	-1.092	0	-6.134
PISO2	B143	ENVOLVENTE MIN	0	0	-0.76	0	-5.022	0	-0.122
PISO2	B143	ENVOLVENTE MIN	1.375	0	2.19	0	-5.022	0	-5.303
PISO2	B143	ENVOLVENTE MIN	2.75	0	5.13	0	-5.022	0	-24.35
PISO1	B143	ENVOLVENTE MAX	0	0	33.71	0	13.64	0	5.254
PISO1	B143	ENVOLVENTE MAX	1.375	0	54.02	0	13.64	0	-16.168
PISO1	B143	ENVOLVENTE MAX	2.75	0	74.33	0	13.64	0	-49.152
PISO1	B143	ENVOLVENTE MIN	0	0	9.14	0	-27.566	0	1.076
PISO1	B143	ENVOLVENTE MIN	1.375	0	18.72	0	-27.566	0	-52.458
PISO1	B143	ENVOLVENTE MIN	2.75	0	28.3	0	-27.566	0	-143.304
PISO1	B144	ENVOLVENTE MAX	0	0	-14.83	0	27.037	0	-9.659
PISO1	B144	ENVOLVENTE MAX	0.6	0	-11.37	0	27.037	0	-1.742
PISO1	B144	ENVOLVENTE MAX	1.2	0	-7.9	0	27.037	0	9.252
PISO1	B144	ENVOLVENTE MIN	0	0	-37.66	0	-16.384	0	-29.796
PISO1	B144	ENVOLVENTE MIN	0.6	0	-31.6	0	-16.384	0	-10.015
PISO1	B144	ENVOLVENTE MIN	1.2	0	-25.53	0	-16.384	0	1.741
PISO2	B146	ENVOLVENTE MAX	0	0	-14.25	0	1.424	0	-18.1
PISO2	B146	ENVOLVENTE MAX	4.75	0	-0.4	0	1.424	0	70.962
PISO2	B146	ENVOLVENTE MAX	4.75	0	12.06	0	1.384	0	43.998
PISO2	B146	ENVOLVENTE MAX	9.5	0	30.52	0	1.384	0	10.697
PISO2	B146	ENVOLVENTE MIN	0	0	-53.16	0	-1.482	0	-142.925
PISO2	B146	ENVOLVENTE MIN	4.75	0	-34.7	0	-1.482	0	16.68
PISO2	B146	ENVOLVENTE MIN	4.75	0	-6.42	0	-1.376	0	13.076
PISO2	B146	ENVOLVENTE MIN	9.5	0	7.43	0	-1.376	0	-63.99
PISO1	B146	ENVOLVENTE MAX	0	0	-91.84	0	11.911	0	-146.387
PISO1	B146	ENVOLVENTE MAX	3.64	0	-54.73	0	11.911	0	334.769
PISO1	B146	ENVOLVENTE MAX	3.64	0	1.91	0	3.473	0	325.743
PISO1	B146	ENVOLVENTE MAX	4.75	0	12.51	0	3.473	0	338.129
PISO1	B146	ENVOLVENTE MAX	6.57	0	51.9	0	3.473	0	280.11
PISO1	B146	ENVOLVENTE MAX	6.57	0	236.97	0	27.36	0	286.07
PISO1	B146	ENVOLVENTE MAX	9.5	0	307.56	0	27.36	0	-105.767
PISO1	B146	ENVOLVENTE MIN	0	0	-313.41	0	-25.177	0	-623.866
PISO1	B146	ENVOLVENTE MIN	3.64	0	-213.31	0	-25.177	0	98.259
PISO1	B146	ENVOLVENTE MIN	3.64	0	-27.83	0	-1.786	0	94.239
PISO1	B146	ENVOLVENTE MIN	4.75	0	-10.86	0	-1.786	0	110.615
PISO1	B146	ENVOLVENTE MIN	6.57	0	7.29	0	-1.786	0	72.695
PISO1	B146	ENVOLVENTE MIN	6.57	0	61.43	0	-12.592	0	75.789
PISO1	B146	ENVOLVENTE MIN	9.5	0	88.76	0	-12.592	0	-511.66
PISO2	B149	ENVOLVENTE MAX	0	0	-11.99	0	1.428	0	-9.9
PISO2	B149	ENVOLVENTE MAX	4.75	0	1.86	0	1.428	0	70.358
PISO2	B149	ENVOLVENTE MAX	4.75	0	12.84	0	1.241	0	42.831
PISO2	B149	ENVOLVENTE MAX	9.5	0	31.3	0	1.241	0	19.163
PISO2	B149	ENVOLVENTE MIN	0	0	-55.65	0	-1.469	0	-152.89

PISO2	B149	ENVOLVENTE MIN	4.75	0	-37.18	0	-1.469	0	14.143
PISO2	B149	ENVOLVENTE MIN	4.75	0	-8.38	0	-1.673	0	12.232
PISO2	B149	ENVOLVENTE MIN	9.5	0	5.47	0	-1.673	0	-68.212
PISO1	B149	ENVOLVENTE MAX	0	0	-86.16	0	14.324	0	-124.694
PISO1	B149	ENVOLVENTE MAX	3.64	0	-49.05	0	14.324	0	327.432
PISO1	B149	ENVOLVENTE MAX	3.64	0	4.78	0	3.434	0	319.102
PISO1	B149	ENVOLVENTE MAX	4.75	0	14.86	0	3.434	0	332.765
PISO1	B149	ENVOLVENTE MAX	6.57	0	54.25	0	3.434	0	276.838
PISO1	B149	ENVOLVENTE MAX	6.57	0	231.41	0	22.426	0	282.564
PISO1	B149	ENVOLVENTE MAX	9.5	0	302	0	22.426	0	-81.8
PISO1	B149	ENVOLVENTE MIN	0	0	-309.03	0	-19.643	0	-615.276
PISO1	B149	ENVOLVENTE MIN	3.64	0	-208.94	0	-19.643	0	92.426
PISO1	B149	ENVOLVENTE MIN	3.64	0	-32.02	0	-1.473	0	88.334
PISO1	B149	ENVOLVENTE MIN	4.75	0	-14.53	0	-1.473	0	109.47
PISO1	B149	ENVOLVENTE MIN	6.57	0	3.63	0	-1.473	0	65.673
PISO1	B149	ENVOLVENTE MIN	6.57	0	54.86	0	-14.614	0	69.028
PISO1	B149	ENVOLVENTE MIN	9.5	0	82.2	0	-14.614	0	-498.894
PISO2	B152	ENVOLVENTE MAX	0	0	-5.69	0	2.082	0	11.595
PISO2	B152	ENVOLVENTE MAX	4.75	0	8.16	0	2.082	0	59.085
PISO2	B152	ENVOLVENTE MAX	4.75	0	9.91	0	2.854	0	30.173
PISO2	B152	ENVOLVENTE MAX	9.5	0	28.38	0	2.854	0	40.235
PISO2	B152	ENVOLVENTE MIN	0	0	-53.91	0	-0.84	0	-153.111
PISO2	B152	ENVOLVENTE MIN	4.75	0	-35.44	0	-0.84	0	5.723
PISO2	B152	ENVOLVENTE MIN	4.75	0	-14.06	0	-0.662	0	6.352
PISO2	B152	ENVOLVENTE MIN	9.5	0	-0.21	0	-0.662	0	-63.224
PISO1	B152	ENVOLVENTE MAX	0	0	-61.76	0	-6.035	0	-59.64
PISO1	B152	ENVOLVENTE MAX	3.64	0	-26.05	0	-6.035	0	235.033
PISO1	B152	ENVOLVENTE MAX	3.64	0	9.06	0	3.037	0	224.794
PISO1	B152	ENVOLVENTE MAX	4.75	0	18.2	0	3.037	0	245.661
PISO1	B152	ENVOLVENTE MAX	6.57	0	53.42	0	3.037	0	205.362
PISO1	B152	ENVOLVENTE MAX	6.57	0	159.43	0	53.786	0	211.478
PISO1	B152	ENVOLVENTE MAX	9.5	0	227.41	0	53.786	0	-2.418
PISO1	B152	ENVOLVENTE MIN	0	0	-247.81	0	-58.459	0	-511.046
PISO1	B152	ENVOLVENTE MIN	3.64	0	-153.2	0	-58.459	0	58.267
PISO1	B152	ENVOLVENTE MIN	3.64	0	-43.09	0	-4.899	0	53.256
PISO1	B152	ENVOLVENTE MIN	4.75	0	-24.78	0	-4.899	0	80.033
PISO1	B152	ENVOLVENTE MIN	6.57	0	-4.97	0	-4.899	0	34.306
PISO1	B152	ENVOLVENTE MIN	6.57	0	24.25	0	2.904	0	37.517
PISO1	B152	ENVOLVENTE MIN	9.5	0	50.92	0	2.904	0	-405.442
PISO1	B158	ENVOLVENTE MAX	0	0	-35.37	0	20.18	0	-30.41
PISO1	B158	ENVOLVENTE MAX	0.6	0	-31.35	0	20.18	0	-10.28
PISO1	B158	ENVOLVENTE MAX	1.2	0	-27.33	0	20.18	0	17.448
PISO1	B158	ENVOLVENTE MIN	0	0	-96.73	0	-40.899	0	-88.744
PISO1	B158	ENVOLVENTE MIN	0.6	0	-88.49	0	-40.899	0	-32.741
PISO1	B158	ENVOLVENTE MIN	1.2	0	-80.25	0	-40.899	0	4.097
PISO2	B159	ENVOLVENTE MAX	0	0	8.98	0	1.633	0	6.806
PISO2	B159	ENVOLVENTE MAX	1.375	0	16.86	0	1.633	0	-3.374
PISO2	B159	ENVOLVENTE MAX	2.75	0	25.19	0	1.633	0	-12.041
PISO2	B159	ENVOLVENTE MIN	0	0	1.88	0	-0.141	0	1.238
PISO2	B159	ENVOLVENTE MIN	1.375	0	4.83	0	-0.141	0	-10.988
PISO2	B159	ENVOLVENTE MIN	2.75	0	7.78	0	-0.141	0	-39.9
PISO1	B159	ENVOLVENTE MAX	0	0	87.95	0	32.076	0	17.512
PISO1	B159	ENVOLVENTE MAX	1.375	0	119.69	0	32.076	0	-39.278
PISO1	B159	ENVOLVENTE MAX	2.75	0	151.43	0	32.076	0	-104.405
PISO1	B159	ENVOLVENTE MIN	0	0	27.69	0	-16.136	0	5.575
PISO1	B159	ENVOLVENTE MIN	1.375	0	40.16	0	-16.136	0	-120.018
PISO1	B159	ENVOLVENTE MIN	2.75	0	52.64	0	-16.136	0	-311.635
PISO2	B163	ENVOLVENTE MAX	0	0	8.63	0	0.554	0	6.645
PISO2	B163	ENVOLVENTE MAX	1.375	0	15.98	0	0.554	0	-2.956
PISO2	B163	ENVOLVENTE MAX	2.75	0	24.31	0	0.554	0	-10.712
PISO2	B163	ENVOLVENTE MIN	0	0	1.22	0	-0.932	0	0.745
PISO2	B163	ENVOLVENTE MIN	1.375	0	4.17	0	-0.932	0	-10.344
PISO2	B163	ENVOLVENTE MIN	2.75	0	7.11	0	-0.932	0	-38.04
PISO1	B163	ENVOLVENTE MAX	0	0	80.64	0	26.915	0	16.653
PISO1	B163	ENVOLVENTE MAX	1.375	0	112.38	0	26.915	0	-34.672
PISO1	B163	ENVOLVENTE MAX	2.75	0	144.12	0	26.915	0	-95.059
PISO1	B163	ENVOLVENTE MIN	0	0	24.24	0	-17.949	0	5.464
PISO1	B163	ENVOLVENTE MIN	1.375	0	36.72	0	-17.949	0	-110.829
PISO1	B163	ENVOLVENTE MIN	2.75	0	49.19	0	-17.949	0	-292.397

PISO1	B168	ENVOLVENTE MIN	0	0	-69.75	0	-29.086	0	-67.593
PISO1	B168	ENVOLVENTE MIN	0.6	0	-62.59	0	-29.086	0	-27.568
PISO1	B168	ENVOLVENTE MIN	1.2	0	-55.43	0	-29.086	0	1.287
PISO2	B169	ENVOLVENTE MAX	0	0	7.75	0	2.934	0	7.265
PISO2	B169	ENVOLVENTE MAX	1.375	0	14.43	0	2.934	0	-0.574
PISO2	B169	ENVOLVENTE MAX	2.75	0	21.52	0	2.934	0	-4.827
PISO2	B169	ENVOLVENTE MIN	0	0	-1.33	0	0.577	0	-0.376
PISO2	B169	ENVOLVENTE MIN	1.375	0	1.62	0	0.577	0	-7.984
PISO2	B169	ENVOLVENTE MIN	2.75	0	4.57	0	0.577	0	-32.421
PISO1	B169	ENVOLVENTE MAX	0	0	77.28	0	8.044	0	13.483
PISO1	B169	ENVOLVENTE MAX	1.375	0	108.08	0	8.044	0	-29.625
PISO1	B169	ENVOLVENTE MAX	2.75	0	138.88	0	8.044	0	-83.089
PISO1	B169	ENVOLVENTE MIN	0	0	19.66	0	-24.405	0	3.666
PISO1	B169	ENVOLVENTE MIN	1.375	0	31.9	0	-24.405	0	-109.254
PISO1	B169	ENVOLVENTE MIN	2.75	0	44.13	0	-24.405	0	-283.744
PISO1	B173	ENVOLVENTE MAX	0	0	-27.87	0	2.066	0	-29.712
PISO1	B173	ENVOLVENTE MAX	3.64	0	-2.07	0	2.066	0	63.219
PISO1	B173	ENVOLVENTE MAX	3.64	0	-5.11	0	0.123	0	64.775
PISO1	B173	ENVOLVENTE MAX	4.75	0	0.83	0	0.123	0	90.193
PISO1	B173	ENVOLVENTE MAX	6.57	0	29.6	0	0.123	0	64.333
PISO1	B173	ENVOLVENTE MAX	6.57	0	20.12	0	-0.58	0	65.736
PISO1	B173	ENVOLVENTE MAX	9.5	0	79.03	0	-0.58	0	-10.339
PISO1	B173	ENVOLVENTE MIN	0	0	-96.02	0	-0.261	0	-134.794
PISO1	B173	ENVOLVENTE MIN	3.64	0	-13.47	0	-0.261	0	14.125
PISO1	B173	ENVOLVENTE MIN	3.64	0	-29.3	0	-1.675	0	15.602
PISO1	B173	ENVOLVENTE MIN	4.75	0	-13.27	0	-1.675	0	26.755
PISO1	B173	ENVOLVENTE MIN	6.57	0	4.96	0	-1.675	0	13.9
PISO1	B173	ENVOLVENTE MIN	6.57	0	3.15	0	-4.78	0	13.393
PISO1	B173	ENVOLVENTE MIN	9.5	0	21.87	0	-4.78	0	-79.527
PISO1	B174	ENVOLVENTE MAX	0	0	5.47	0	5.917	0	-0.659
PISO1	B174	ENVOLVENTE MAX	1.375	0	29.23	0	5.917	0	-5.64
PISO1	B174	ENVOLVENTE MAX	2.75	0	55.6	0	5.917	0	-22.926
PISO1	B174	ENVOLVENTE MIN	0	0	-1.3	0	1.106	0	-6.075
PISO1	B174	ENVOLVENTE MIN	1.375	0	7.16	0	1.106	0	-22.787
PISO1	B174	ENVOLVENTE MIN	2.75	0	15.62	0	1.106	0	-86.306
PISO1	B175	ENVOLVENTE MAX	0	0	0.32	0	-1.856	0	0.648
PISO1	B175	ENVOLVENTE MAX	0.6	0	2.59	0	-1.856	0	-0.11
PISO1	B175	ENVOLVENTE MAX	1.2	0	4.86	0	-1.856	0	-1.19
PISO1	B175	ENVOLVENTE MIN	0	0	-17.65	0	-9.631	0	-20.52
PISO1	B175	ENVOLVENTE MIN	0.6	0	-12.83	0	-9.631	0	-11.052
PISO1	B175	ENVOLVENTE MIN	1.2	0	-8	0	-9.631	0	-6.901
PISO1	B176	ENVOLVENTE MAX	0	0	-31.27	0	3.735	0	-36.063
PISO1	B176	ENVOLVENTE MAX	3.64	0	-4.78	0	3.735	0	80.737
PISO1	B176	ENVOLVENTE MAX	3.64	0	-5.13	0	0.59	0	83.197
PISO1	B176	ENVOLVENTE MAX	4.75	0	0.81	0	0.59	0	107.251
PISO1	B176	ENVOLVENTE MAX	6.57	0	31.12	0	0.59	0	78.728
PISO1	B176	ENVOLVENTE MAX	6.57	0	29.86	0	0.001	0	79.008
PISO1	B176	ENVOLVENTE MAX	9.5	0	89.06	0	0.001	0	-16.521
PISO1	B176	ENVOLVENTE MIN	0	0	-108.33	0	0.501	0	-157.15
PISO1	B176	ENVOLVENTE MIN	3.64	0	-22.38	0	0.501	0	19.955
PISO1	B176	ENVOLVENTE MIN	3.64	0	-28.07	0	-0.284	0	21.591
PISO1	B176	ENVOLVENTE MIN	4.75	0	-11.97	0	-0.284	0	32.028
PISO1	B176	ENVOLVENTE MIN	6.57	0	5.75	0	-0.284	0	18.088
PISO1	B176	ENVOLVENTE MIN	6.57	0	6.52	0	-2.349	0	17.198
PISO1	B176	ENVOLVENTE MIN	9.5	0	25.31	0	-2.349	0	-95.208
PISO1	B177	ENVOLVENTE MAX	0	0	9.29	0	-1.334	0	-1.222
PISO1	B177	ENVOLVENTE MAX	1.375	0	33.97	0	-1.334	0	-8.147
PISO1	B177	ENVOLVENTE MAX	2.75	0	60.36	0	-1.334	0	-27.137
PISO1	B177	ENVOLVENTE MIN	0	0	0.05	0	-6.584	0	-7.431
PISO1	B177	ENVOLVENTE MIN	1.375	0	8.52	0	-6.584	0	-30.766
PISO1	B177	ENVOLVENTE MIN	2.75	0	16.98	0	-6.584	0	-100.838
PISO1	B178	ENVOLVENTE MAX	0	0	1.17	0	5.624	0	0.491
PISO1	B178	ENVOLVENTE MAX	0.6	0	3.45	0	5.624	0	-0.78
PISO1	B178	ENVOLVENTE MAX	1.2	0	6.7	0	5.624	0	-2.149
PISO1	B178	ENVOLVENTE MIN	0	0	-12.91	0	0.877	0	-17.208
PISO1	B178	ENVOLVENTE MIN	0.6	0	-8.09	0	0.877	0	-10.585
PISO1	B178	ENVOLVENTE MIN	1.2	0	-4.24	0	0.877	0	-10.089
PISO1	B179	ENVOLVENTE MAX	0	0	-30.47	0	-0.561	0	-34.814
PISO1	B179	ENVOLVENTE MAX	3.64	0	-4.67	0	-0.561	0	77.376

PISO1	B179	ENVOLVENTE MIN	6.57	0	5.24	0	-0.843	0	17.58
PISO1	B179	ENVOLVENTE MIN	6.57	0	4.77	0	-0.443	0	15.605
PISO1	B179	ENVOLVENTE MIN	9.5	0	23.49	0	-0.443	0	-85.544
PISO1	B180	ENVOLVENTE MAX	0	0	2.21	0	-1.595	0	1.788
PISO1	B180	ENVOLVENTE MAX	0.6	0	4.48	0	-1.595	0	-0.106
PISO1	B180	ENVOLVENTE MAX	1.2	0	6.75	0	-1.595	0	-1.753
PISO1	B180	ENVOLVENTE MIN	0	0	-16.04	0	-8.317	0	-19.59
PISO1	B180	ENVOLVENTE MIN	0.6	0	-11.21	0	-8.317	0	-11.09
PISO1	B180	ENVOLVENTE MIN	1.2	0	-6.38	0	-8.317	0	-8.668
PISO1	B181	ENVOLVENTE MAX	0	0	10.06	0	8.036	0	-1.279
PISO1	B181	ENVOLVENTE MAX	1.375	0	34.95	0	8.036	0	-8.822
PISO1	B181	ENVOLVENTE MAX	2.75	0	61.32	0	8.036	0	-28.696
PISO1	B181	ENVOLVENTE MIN	0	0	0.46	0	2.095	0	-8.056
PISO1	B181	ENVOLVENTE MIN	1.375	0	8.92	0	2.095	0	-32.775
PISO1	B181	ENVOLVENTE MIN	2.75	0	17.38	0	2.095	0	-104.159
PISO1	B182	ENVOLVENTE MAX	0	0	-30.3	0	2.723	0	-32.995
PISO1	B182	ENVOLVENTE MAX	3.64	0	-3.81	0	2.723	0	76.141
PISO1	B182	ENVOLVENTE MAX	3.64	0	-4.62	0	0.724	0	80.447
PISO1	B182	ENVOLVENTE MAX	4.75	0	1.32	0	0.724	0	105.765
PISO1	B182	ENVOLVENTE MAX	6.57	0	29.99	0	0.724	0	79.315
PISO1	B182	ENVOLVENTE MAX	6.57	0	25.5	0	0.274	0	77.22
PISO1	B182	ENVOLVENTE MAX	9.5	0	84.7	0	0.274	0	-11.68
PISO1	B182	ENVOLVENTE MIN	0	0	-105.2	0	0.235	0	-150.381
PISO1	B182	ENVOLVENTE MIN	3.64	0	-19.26	0	0.235	0	17.216
PISO1	B182	ENVOLVENTE MIN	3.64	0	-29.21	0	-0.442	0	19.599
PISO1	B182	ENVOLVENTE MIN	4.75	0	-13.71	0	-0.442	0	31.761
PISO1	B182	ENVOLVENTE MIN	6.57	0	4.54	0	-0.442	0	16.97
PISO1	B182	ENVOLVENTE MIN	6.57	0	5.35	0	-1.328	0	15.208
PISO1	B182	ENVOLVENTE MIN	9.5	0	24.14	0	-1.328	0	-84.233
PISO1	B183	ENVOLVENTE MAX	0	0	1.98	0	6.54	0	1.637
PISO1	B183	ENVOLVENTE MAX	0.6	0	4.25	0	6.54	0	-0.12
PISO1	B183	ENVOLVENTE MAX	1.2	0	8.59	0	6.54	0	-1.856
PISO1	B183	ENVOLVENTE MIN	0	0	-11.03	0	0.795	0	-14.49
PISO1	B183	ENVOLVENTE MIN	0.6	0	-6.2	0	0.795	0	-8.998
PISO1	B183	ENVOLVENTE MIN	1.2	0	-3.44	0	0.795	0	-9.508
PISO1	B184	ENVOLVENTE MAX	0	0	7.03	0	-1.079	0	-1.89
PISO1	B184	ENVOLVENTE MAX	1.375	0	31.84	0	-1.079	0	-7.715
PISO1	B184	ENVOLVENTE MAX	2.75	0	58.24	0	-1.079	0	-26.34
PISO1	B184	ENVOLVENTE MIN	0	0	-0.13	0	-6.125	0	-9.308
PISO1	B184	ENVOLVENTE MIN	1.375	0	8.34	0	-6.125	0	-29.722
PISO1	B184	ENVOLVENTE MIN	2.75	0	16.8	0	-6.125	0	-96.873
PISO1	B185	ENVOLVENTE MAX	0	0	-29.51	0	-0.358	0	-29.115
PISO1	B185	ENVOLVENTE MAX	3.64	0	-3.71	0	-0.358	0	78.888
PISO1	B185	ENVOLVENTE MAX	3.64	0	-3.38	0	0.537	0	82.647
PISO1	B185	ENVOLVENTE MAX	4.75	0	2.56	0	0.537	0	106.912
PISO1	B185	ENVOLVENTE MAX	6.57	0	30.64	0	0.537	0	79.161
PISO1	B185	ENVOLVENTE MAX	6.57	0	26.97	0	0.904	0	76.469
PISO1	B185	ENVOLVENTE MAX	9.5	0	85.87	0	0.904	0	-6.859
PISO1	B185	ENVOLVENTE MIN	0	0	-106.84	0	-2.524	0	-158.504
PISO1	B185	ENVOLVENTE MIN	3.64	0	-23.6	0	-2.524	0	17.069
PISO1	B185	ENVOLVENTE MIN	3.64	0	-28.26	0	-0.687	0	19.114
PISO1	B185	ENVOLVENTE MIN	4.75	0	-13.97	0	-0.687	0	31.368
PISO1	B185	ENVOLVENTE MIN	6.57	0	3.74	0	-0.687	0	14.987
PISO1	B185	ENVOLVENTE MIN	6.57	0	4.57	0	-0.233	0	13.343
PISO1	B185	ENVOLVENTE MIN	9.5	0	23.28	0	-0.233	0	-90.384
PISO1	B186	ENVOLVENTE MAX	0	0	10.94	0	7.737	0	-1.123
PISO1	B186	ENVOLVENTE MAX	1.375	0	34.77	0	7.737	0	-6.98
PISO1	B186	ENVOLVENTE MAX	2.75	0	61.14	0	7.737	0	-25.037
PISO1	B186	ENVOLVENTE MIN	0	0	-0.8	0	1.958	0	-7.717
PISO1	B186	ENVOLVENTE MIN	1.375	0	7.66	0	1.958	0	-32.165
PISO1	B186	ENVOLVENTE MIN	2.75	0	16.12	0	1.958	0	-103.302
PISO1	B187	ENVOLVENTE MAX	0	0	1.99	0	-1.435	0	1.857
PISO1	B187	ENVOLVENTE MAX	0.6	0	4.27	0	-1.435	0	0.679
PISO1	B187	ENVOLVENTE MAX	1.2	0	6.54	0	-1.435	0	-1.574
PISO1	B187	ENVOLVENTE MIN	0	0	-17.53	0	-7.959	0	-21.58
PISO1	B187	ENVOLVENTE MIN	0.6	0	-12.7	0	-7.959	0	-12.774
PISO1	B187	ENVOLVENTE MIN	1.2	0	-7.87	0	-7.959	0	-8.598
PISO1	B188	ENVOLVENTE MAX	0	0	-29.49	0	1.485	0	-27.983
PISO1	B188	ENVOLVENTE MAX	3.64	0	-3	0	1.485	0	73.742

PISO1	B188	ENVOLVENTE MIN	6.57	0	2.13	0	-0.467	0	13.237
PISO1	B188	ENVOLVENTE MIN	6.57	0	5.09	0	-0.696	0	11.886
PISO1	B188	ENVOLVENTE MIN	9.5	0	23.88	0	-0.696	0	-85.513
PISO1	B189	ENVOLVENTE MAX	0	0	6.31	0	-1.129	0	-2.699
PISO1	B189	ENVOLVENTE MAX	1.375	0	30.15	0	-1.129	0	-6.333
PISO1	B189	ENVOLVENTE MAX	2.75	0	56.54	0	-1.129	0	-23.275
PISO1	B189	ENVOLVENTE MIN	0	0	-1.34	0	-6.616	0	-10.268
PISO1	B189	ENVOLVENTE MIN	1.375	0	7.12	0	-6.616	0	-28.35
PISO1	B189	ENVOLVENTE MIN	2.75	0	15.59	0	-6.616	0	-93.168
PISO1	B190	ENVOLVENTE MAX	0	0	1.02	0	7.354	0	1.489
PISO1	B190	ENVOLVENTE MAX	0.6	0	3.29	0	7.354	0	0.719
PISO1	B190	ENVOLVENTE MAX	1.2	0	7.24	0	7.354	0	-1.435
PISO1	B190	ENVOLVENTE MIN	0	0	-11.24	0	0.627	0	-15.116
PISO1	B190	ENVOLVENTE MIN	0.6	0	-6.41	0	0.627	0	-9.902
PISO1	B190	ENVOLVENTE MIN	1.2	0	-3.27	0	0.627	0	-9.033
PISO1	B191	ENVOLVENTE MAX	0	0	-13.55	0	-4.411	0	-2.767
PISO1	B191	ENVOLVENTE MAX	3.64	0	1.49	0	-4.411	0	31.893
PISO1	B191	ENVOLVENTE MAX	3.64	0	2.17	0	-0.013	0	38.714
PISO1	B191	ENVOLVENTE MAX	4.75	0	6.19	0	-0.013	0	50.942
PISO1	B191	ENVOLVENTE MAX	6.57	0	19.19	0	-0.013	0	51.008
PISO1	B191	ENVOLVENTE MAX	6.57	0	12.54	0	6.361	0	45.972
PISO1	B191	ENVOLVENTE MAX	9.5	0	39.76	0	6.361	0	15.3
PISO1	B191	ENVOLVENTE MIN	0	0	-54.44	0	-14.286	0	-111.134
PISO1	B191	ENVOLVENTE MIN	3.64	0	-17.02	0	-14.286	0	-1.729
PISO1	B191	ENVOLVENTE MIN	3.64	0	-23.53	0	-1.537	0	2.162
PISO1	B191	ENVOLVENTE MIN	4.75	0	-15.14	0	-1.537	0	15.945
PISO1	B191	ENVOLVENTE MIN	6.57	0	-4.09	0	-1.537	0	-0.953
PISO1	B191	ENVOLVENTE MIN	6.57	0	-1.58	0	1.277	0	-3.63
PISO1	B191	ENVOLVENTE MIN	9.5	0	9.96	0	1.277	0	-58.499
PISO1	B192	ENVOLVENTE MAX	0	0	4.37	0	0.503	0	6.675
PISO1	B192	ENVOLVENTE MAX	0.6	0	6.09	0	0.503	0	3.593
PISO1	B192	ENVOLVENTE MAX	1.2	0	8.46	0	0.503	0	-0.292
PISO1	B192	ENVOLVENTE MIN	0	0	-11.63	0	-6.016	0	-14.685
PISO1	B192	ENVOLVENTE MIN	0.6	0	-8.44	0	-6.016	0	-8.5
PISO1	B192	ENVOLVENTE MIN	1.2	0	-5.91	0	-6.016	0	-4.895
PISO1	B193	ENVOLVENTE MAX	0	0	10.74	0	3.431	0	1.942
PISO1	B193	ENVOLVENTE MAX	1.375	0	31.68	0	3.431	0	-4.687
PISO1	B193	ENVOLVENTE MAX	2.75	0	56.04	0	3.431	0	-21.133
PISO1	B193	ENVOLVENTE MIN	0	0	-0.72	0	0.487	0	-1.257
PISO1	B193	ENVOLVENTE MIN	1.375	0	7.23	0	0.487	0	-22.937
PISO1	B193	ENVOLVENTE MIN	2.75	0	15.18	0	0.487	0	-86.682
PISO1	B194	ENVOLVENTE MAX	0	0	-1.81	0	2.779	0	-0.97
PISO1	B194	ENVOLVENTE MAX	1.375	0	7.37	0	2.779	0	0.079
PISO1	B194	ENVOLVENTE MAX	2.75	0	21.27	0	2.779	0	-6.444
PISO1	B194	ENVOLVENTE MIN	0	0	-6.53	0	0.407	0	-4.761
PISO1	B194	ENVOLVENTE MIN	1.375	0	1.71	0	0.407	0	-4.025
PISO1	B194	ENVOLVENTE MIN	2.75	0	7	0	0.407	0	-24.919
PISO1	B197	ENVOLVENTE MAX	0	0	6.53	0	-0.97	0	-0.407
PISO1	B197	ENVOLVENTE MAX	0.95	0	14.45	0	-0.97	0	-3.931
PISO1	B197	ENVOLVENTE MAX	1.9	0	22.37	0	-0.97	0	-10.557
PISO1	B197	ENVOLVENTE MIN	0	0	1.81	0	-4.761	0	-2.779
PISO1	B197	ENVOLVENTE MIN	0.95	0	5.05	0	-4.761	0	-11.704
PISO1	B197	ENVOLVENTE MIN	1.9	0	8.28	0	-4.761	0	-30.054
PISO1	B198	ENVOLVENTE MAX	0	0	16.92	0	-0.375	0	-11.385
PISO1	B198	ENVOLVENTE MAX	0.975	0	23.77	0	-0.375	0	-15.075
PISO1	B198	ENVOLVENTE MAX	1.95	0	31.59	0	-0.375	0	-21.865
PISO1	B198	ENVOLVENTE MIN	0	0	0.79	0	-4.67	0	-33.244
PISO1	B198	ENVOLVENTE MIN	0.975	0	4.14	0	-4.67	0	-51.013
PISO1	B198	ENVOLVENTE MIN	1.95	0	7.49	0	-4.67	0	-78.717
PISO1	B199	ENVOLVENTE MAX	0	0	-12.09	0	9.274	0	-3.345
PISO1	B199	ENVOLVENTE MAX	1.63	0	-4.95	0	9.274	0	11.608
PISO1	B199	ENVOLVENTE MAX	3.26	0	2.2	0	9.274	0	23.081
PISO1	B199	ENVOLVENTE MIN	0	0	-45.69	0	2.708	0	-75.886
PISO1	B199	ENVOLVENTE MIN	1.63	0	-25.8	0	2.708	0	-18.16
PISO1	B199	ENVOLVENTE MIN	3.26	0	-9.55	0	2.708	0	-2.882
PISO1	B200	ENVOLVENTE MAX	0	0	1	0	0.76	0	27.568
PISO1	B200	ENVOLVENTE MAX	1.31	0	8.26	0	0.76	0	31.434
PISO1	B200	ENVOLVENTE MAX	2.62	0	19.46	0	0.76	0	18.523
PISO1	B200	ENVOLVENTE MIN	0	0	-13.33	0	-1.847	0	0.141

PISO1	B202	ENVOLVENTE MAX	1.63	0	-5.58	0	7.966	0	6.278
PISO1	B202	ENVOLVENTE MAX	3.26	0	1.56	0	7.966	0	17.76
PISO1	B202	ENVOLVENTE MIN	0	0	-43.62	0	1.904	0	-61.124
PISO1	B202	ENVOLVENTE MIN	1.63	0	-23.72	0	1.904	0	-8.912
PISO1	B202	ENVOLVENTE MIN	3.26	0	-5.9	0	1.904	0	1.454
PISO1	B203	ENVOLVENTE MAX	0	0	0.02	0	0.478	0	22.34
PISO1	B203	ENVOLVENTE MAX	1.31	0	7.23	0	0.478	0	27.74
PISO1	B203	ENVOLVENTE MAX	2.62	0	18.43	0	0.478	0	14.867
PISO1	B203	ENVOLVENTE MIN	0	0	-11.27	0	-1.998	0	4.137
PISO1	B203	ENVOLVENTE MIN	1.31	0	-2.1	0	-1.998	0	7.947
PISO1	B203	ENVOLVENTE MIN	2.62	0	3.07	0	-1.998	0	-2.187
PISO1	B204	ENVOLVENTE MAX	0	0	9.88	0	-2.256	0	8.78
PISO1	B204	ENVOLVENTE MAX	1.31	0	23.45	0	-2.256	0	1.81
PISO1	B204	ENVOLVENTE MAX	2.62	0	37.22	0	-2.256	0	-11.432
PISO1	B204	ENVOLVENTE MIN	0	0	1.1	0	-9.399	0	-5.156
PISO1	B204	ENVOLVENTE MIN	1.31	0	6.28	0	-9.399	0	-21.023
PISO1	B204	ENVOLVENTE MIN	2.62	0	11.46	0	-9.399	0	-58.909
PISO1	B205	ENVOLVENTE MAX	0	0	-15.21	0	8.113	0	-13.142
PISO1	B205	ENVOLVENTE MAX	1.63	0	-8.07	0	8.113	0	6.929
PISO1	B205	ENVOLVENTE MAX	3.26	0	-0.92	0	8.113	0	27.683
PISO1	B205	ENVOLVENTE MIN	0	0	-50.73	0	2.128	0	-72.836
PISO1	B205	ENVOLVENTE MIN	1.63	0	-30.83	0	2.128	0	-10.011
PISO1	B205	ENVOLVENTE MIN	3.26	0	-11.48	0	2.128	0	5.374
PISO1	B206	ENVOLVENTE MAX	0	0	-1.66	0	1.684	0	34.267
PISO1	B206	ENVOLVENTE MAX	1.31	0	3.52	0	1.684	0	51.764
PISO1	B206	ENVOLVENTE MAX	2.62	0	12.55	0	1.684	0	47.551
PISO1	B206	ENVOLVENTE MIN	0	0	-20.08	0	-0.842	0	8.361
PISO1	B206	ENVOLVENTE MIN	1.31	0	-8.88	0	-0.842	0	14.288
PISO1	B206	ENVOLVENTE MIN	2.62	0	-1.54	0	-0.842	0	5.909
PISO1	B207	ENVOLVENTE MAX	0	0	8.04	0	-1.076	0	43.249
PISO1	B207	ENVOLVENTE MAX	1.31	0	19.94	0	-1.076	0	34.813
PISO1	B207	ENVOLVENTE MAX	2.62	0	33.71	0	-1.076	0	13.64
PISO1	B207	ENVOLVENTE MIN	0	0	-1.21	0	-5.254	0	3.617
PISO1	B207	ENVOLVENTE MIN	1.31	0	3.97	0	-5.254	0	-5.342
PISO1	B207	ENVOLVENTE MIN	2.62	0	9.14	0	-5.254	0	-27.566
PISO1	B210	ENVOLVENTE MAX	0	0	49.1	0	44.744	0	10.843
PISO1	B210	ENVOLVENTE MAX	0.975	0	63.42	0	44.744	0	-6.57
PISO1	B210	ENVOLVENTE MAX	1.95	0	79.34	0	44.744	0	-23.297
PISO1	B210	ENVOLVENTE MIN	0	0	5.59	0	-9.555	0	1.857
PISO1	B210	ENVOLVENTE MIN	0.975	0	13.03	0	-9.555	0	-43.376
PISO1	B210	ENVOLVENTE MIN	1.95	0	20.47	0	-9.555	0	-113.36
PISO1	B211	ENVOLVENTE MAX	0	0	-43.63	0	-2.542	0	-15.964
PISO1	B211	ENVOLVENTE MAX	1.63	0	-29.23	0	-2.542	0	45.765
PISO1	B211	ENVOLVENTE MAX	3.26	0	-14.83	0	-2.542	0	177.596
PISO1	B211	ENVOLVENTE MIN	0	0	-172.69	0	-72.723	0	-299.212
PISO1	B211	ENVOLVENTE MIN	1.63	0	-136.58	0	-72.723	0	-59.947
PISO1	B211	ENVOLVENTE MIN	3.26	0	-100.48	0	-72.723	0	41.728
PISO1	B212	ENVOLVENTE MAX	0	0	10.18	0	5.464	0	171.372
PISO1	B212	ENVOLVENTE MAX	1.31	0	29.46	0	5.464	0	167.719
PISO1	B212	ENVOLVENTE MAX	2.62	0	51.26	0	5.464	0	123.249
PISO1	B212	ENVOLVENTE MIN	0	0	-22.18	0	-3.827	0	38.592
PISO1	B212	ENVOLVENTE MIN	1.31	0	-8.8	0	-3.827	0	54.383
PISO1	B212	ENVOLVENTE MIN	2.62	0	2.05	0	-3.827	0	24.624
PISO1	B213	ENVOLVENTE MAX	0	0	143.73	0	72.956	0	131.433
PISO1	B213	ENVOLVENTE MAX	1.31	0	169.92	0	72.956	0	26.051
PISO1	B213	ENVOLVENTE MAX	2.62	0	196.11	0	72.956	0	-26.968
PISO1	B213	ENVOLVENTE MIN	0	0	23.52	0	11.385	0	28.432
PISO1	B213	ENVOLVENTE MIN	1.31	0	34.38	0	11.385	0	-106.672
PISO1	B213	ENVOLVENTE MIN	2.62	0	45.23	0	11.385	0	-335.29
PISO1	B214	ENVOLVENTE MAX	0	0	-47.48	0	-6.437	0	-46.951
PISO1	B214	ENVOLVENTE MAX	1.63	0	-33.08	0	-6.437	0	20.57
PISO1	B214	ENVOLVENTE MAX	3.26	0	-18.67	0	-6.437	0	146.941
PISO1	B214	ENVOLVENTE MIN	0	0	-179.38	0	-66.246	0	-325.984

PISO1	B215	ENVOLVENTE MAX	2.62	0	42.05	0	9.975	0	110.891
PISO1	B215	ENVOLVENTE MIN	0	0	-24.52	0	-2.765	0	37.793
PISO1	B215	ENVOLVENTE MIN	1.31	0	-7.7	0	-2.765	0	47.379
PISO1	B215	ENVOLVENTE MIN	2.62	0	3.16	0	-2.765	0	20.432
PISO1	B216	ENVOLVENTE MAX	0	0	133.01	0	76.68	0	119.078
PISO1	B216	ENVOLVENTE MAX	1.31	0	159.19	0	76.68	0	21.182
PISO1	B216	ENVOLVENTE MAX	2.62	0	185.38	0	76.68	0	-33.215
PISO1	B216	ENVOLVENTE MIN	0	0	24.54	0	13.555	0	24.227
PISO1	B216	ENVOLVENTE MIN	1.31	0	35.4	0	13.555	0	-100.249
PISO1	B216	ENVOLVENTE MIN	2.62	0	46.26	0	13.555	0	-312.173
PISO1	B217	ENVOLVENTE MAX	0	0	-50.31	0	-9.323	0	-49.636
PISO1	B217	ENVOLVENTE MAX	1.63	0	-35.91	0	-9.323	0	22.234
PISO1	B217	ENVOLVENTE MAX	3.26	0	-21.5	0	-9.323	0	171.574
PISO1	B217	ENVOLVENTE MIN	0	0	-198.2	0	-61.204	0	-365.869
PISO1	B217	ENVOLVENTE MIN	1.63	0	-162.09	0	-61.204	0	-89.569
PISO1	B217	ENVOLVENTE MIN	3.26	0	-125.99	0	-61.204	0	51.886
PISO1	B218	ENVOLVENTE MAX	0	0	3.18	0	20.159	0	164.052
PISO1	B218	ENVOLVENTE MAX	1.31	0	14.03	0	20.159	0	185.888
PISO1	B218	ENVOLVENTE MAX	2.62	0	35.45	0	20.159	0	166.906
PISO1	B218	ENVOLVENTE MIN	0	0	-37.41	0	0.566	0	48.118
PISO1	B218	ENVOLVENTE MIN	1.31	0	-15.61	0	0.566	0	55.724
PISO1	B218	ENVOLVENTE MIN	2.62	0	-4.38	0	0.566	0	29.769
PISO1	B219	ENVOLVENTE MAX	0	0	118.58	0	81.804	0	171.757
PISO1	B219	ENVOLVENTE MAX	1.31	0	144.76	0	81.804	0	60.161
PISO1	B219	ENVOLVENTE MAX	2.62	0	170.95	0	81.804	0	13.066
PISO1	B219	ENVOLVENTE MIN	0	0	18.02	0	12.721	0	32.607
PISO1	B219	ENVOLVENTE MIN	1.31	0	28.88	0	12.721	0	-57.311
PISO1	B219	ENVOLVENTE MIN	2.62	0	39.73	0	12.721	0	-255.665
PISO1	B220	ENVOLVENTE MAX	0	0	21.27	0	24.919	0	2.779
PISO1	B220	ENVOLVENTE MAX	0.95	0	32.88	0	24.919	0	-8.095
PISO1	B220	ENVOLVENTE MAX	1.9	0	44.49	0	24.919	0	-23.597
PISO1	B220	ENVOLVENTE MIN	0	0	7	0	6.444	0	0.407
PISO1	B220	ENVOLVENTE MIN	0.95	0	13	0	6.444	0	-22.256
PISO1	B220	ENVOLVENTE MIN	1.9	0	19	0	6.444	0	-59.874
PISO1	B221	ENVOLVENTE MAX	0	0	154.97	0	31.469	0	-16.05
PISO1	B221	ENVOLVENTE MAX	0.975	0	172.78	0	31.469	0	-69.128
PISO1	B221	ENVOLVENTE MAX	1.95	0	190.6	0	31.469	0	-127.815
PISO1	B221	ENVOLVENTE MIN	0	0	48.22	0	-14.751	0	-42.399
PISO1	B221	ENVOLVENTE MIN	0.975	0	55.87	0	-14.751	0	-200.313
PISO1	B221	ENVOLVENTE MIN	1.95	0	63.53	0	-14.751	0	-379.329
PISO1	B222	ENVOLVENTE MAX	0	0	-68.46	0	63.34	0	-69.882
PISO1	B222	ENVOLVENTE MAX	1.63	0	-52.49	0	63.34	0	31.966
PISO1	B222	ENVOLVENTE MAX	3.26	0	-36.52	0	63.34	0	247.685
PISO1	B222	ENVOLVENTE MIN	0	0	-253.66	0	0.314	0	-442.563
PISO1	B222	ENVOLVENTE MIN	1.63	0	-211.37	0	0.314	0	-100.087
PISO1	B222	ENVOLVENTE MIN	3.26	0	-169.08	0	0.314	0	57.419
PISO1	B223	ENVOLVENTE MAX	0	0	12.68	0	3.969	0	240.338
PISO1	B223	ENVOLVENTE MAX	1.31	0	34.76	0	3.969	0	235.579
PISO1	B223	ENVOLVENTE MAX	2.62	0	58.84	0	3.969	0	183.462
PISO1	B223	ENVOLVENTE MIN	0	0	-25.46	0	-4.352	0	53.561
PISO1	B223	ENVOLVENTE MIN	1.31	0	-11.81	0	-4.352	0	73.588
PISO1	B223	ENVOLVENTE MIN	2.62	0	-0.18	0	-4.352	0	38.779
PISO1	B224	ENVOLVENTE MAX	0	0	218.92	0	-6.707	0	193.557
PISO1	B224	ENVOLVENTE MAX	1.31	0	248.15	0	-6.707	0	20.251
PISO1	B224	ENVOLVENTE MAX	2.62	0	277.39	0	-6.707	0	-64.03
PISO1	B224	ENVOLVENTE MIN	0	0	45.97	0	-55.593	0	43.172
PISO1	B224	ENVOLVENTE MIN	1.31	0	57.6	0	-55.593	0	-140.111
PISO1	B224	ENVOLVENTE MIN	2.62	0	69.23	0	-55.593	0	-456.602
PISO1	B225	ENVOLVENTE MAX	0	0	-70.43	0	51.313	0	-85.632
PISO1	B225	ENVOLVENTE MAX	1.63	0	-54.46	0	51.313	0	18.957
PISO1	B225	ENVOLVENTE MAX	3.26	0	-38.49	0	51.313	0	236.042
PISO1	B225	ENVOLVENTE MIN	0	0	-256.71	0	1.171	0	-462.955
PISO1	B225	ENVOLVENTE MIN	1.63	0	-214.42	0	1.171	0	-99.548
PISO1	B225	ENVOLVENTE MIN	3.26	0	-172.13	0	1.171	0	65.427
PISO1	B226	ENVOLVENTE MAX	0	0	10.07	0	3.16	0	227.461
PISO1	B226	ENVOLVENTE MAX	1.31	0	31.17	0	3.16	0	224.219
PISO1	B226	ENVOLVENTE MAX	2.62	0	55.26	0	3.16	0	173.618
PISO1	B226	ENVOLVENTE MIN	0	0	-22.82	0	-8.229	0	61.441
PISO1	B226	ENVOLVENTE MIN	1.31	0	-8.21	0	-8.229	0	71.122

PISO1	B227	ENVOLVENTE MIN	0	0	51.69	0	-55.161	0	39.302
PISO1	B227	ENVOLVENTE MIN	1.31	0	63.32	0	-55.161	0	-139.947
PISO1	B227	ENVOLVENTE MIN	2.62	0	74.95	0	-55.161	0	-459.408
PISO1	B228	ENVOLVENTE MAX	0	0	-73.31	0	45.642	0	-90.165
PISO1	B228	ENVOLVENTE MAX	1.63	0	-57.34	0	45.642	0	18.757
PISO1	B228	ENVOLVENTE MAX	3.26	0	-41.37	0	45.642	0	258.676
PISO1	B228	ENVOLVENTE MIN	0	0	-277.77	0	4.691	0	-508.993
PISO1	B228	ENVOLVENTE MIN	1.63	0	-235.48	0	4.691	0	-113.391
PISO1	B228	ENVOLVENTE MIN	3.26	0	-193.19	0	4.691	0	76.159
PISO1	B229	ENVOLVENTE MAX	0	0	7.45	0	1.889	0	248.446
PISO1	B229	ENVOLVENTE MAX	1.31	0	21.4	0	1.889	0	265.926
PISO1	B229	ENVOLVENTE MAX	2.62	0	45.49	0	1.889	0	236.048
PISO1	B229	ENVOLVENTE MIN	0	0	-38.31	0	-12.902	0	71.298
PISO1	B229	ENVOLVENTE MIN	1.31	0	-16.55	0	-12.902	0	78.676
PISO1	B229	ENVOLVENTE MIN	2.62	0	-4.92	0	-12.902	0	45.391
PISO1	B230	ENVOLVENTE MAX	0	0	185.58	0	-6.167	0	239.9
PISO1	B230	ENVOLVENTE MAX	1.31	0	214.82	0	-6.167	0	56.937
PISO1	B230	ENVOLVENTE MAX	2.62	0	244.05	0	-6.167	0	-19.4
PISO1	B230	ENVOLVENTE MIN	0	0	39.73	0	-59.158	0	47.777
PISO1	B230	ENVOLVENTE MIN	1.31	0	51.36	0	-59.158	0	-76.779
PISO1	B230	ENVOLVENTE MIN	2.62	0	62.99	0	-59.158	0	-349.436
PISO1	B232	ENVOLVENTE MAX	0	0	8.46	0	4.895	0	0.503
PISO1	B232	ENVOLVENTE MAX	0.975	0	14.67	0	4.895	0	0.289
PISO1	B232	ENVOLVENTE MAX	1.95	0	20.88	0	4.895	0	1.298
PISO1	B232	ENVOLVENTE MIN	0	0	-5.91	0	0.292	0	-6.016
PISO1	B232	ENVOLVENTE MIN	0.975	0	-2.77	0	0.292	0	-12.223
PISO1	B232	ENVOLVENTE MIN	1.95	0	0.37	0	0.292	0	-30.023
PISO1	B233	ENVOLVENTE MAX	0	0	-9.05	0	-0.989	0	8.325
PISO1	B233	ENVOLVENTE MAX	1.63	0	-3.43	0	-0.989	0	24.326
PISO1	B233	ENVOLVENTE MAX	3.26	0	2.19	0	-0.989	0	35.938
PISO1	B233	ENVOLVENTE MIN	0	0	-35.13	0	-8.553	0	-56.97
PISO1	B233	ENVOLVENTE MIN	1.63	0	-23.07	0	-8.553	0	-14.497
PISO1	B233	ENVOLVENTE MIN	3.26	0	-11.59	0	-8.553	0	1.81
PISO1	B234	ENVOLVENTE MAX	0	0	5.45	0	1.099	0	40.855
PISO1	B234	ENVOLVENTE MAX	1.31	0	13.01	0	1.099	0	37.63
PISO1	B234	ENVOLVENTE MAX	2.62	0	21.91	0	1.099	0	27.467
PISO1	B234	ENVOLVENTE MIN	0	0	-10.89	0	-0.581	0	4.874
PISO1	B234	ENVOLVENTE MIN	1.31	0	-5.14	0	-0.581	0	11.895
PISO1	B234	ENVOLVENTE MIN	2.62	0	-0.73	0	-0.581	0	-2.365
PISO1	B235	ENVOLVENTE MAX	0	0	16.42	0	9.077	0	22.056
PISO1	B235	ENVOLVENTE MAX	1.31	0	26.89	0	9.077	0	6.898
PISO1	B235	ENVOLVENTE MAX	2.62	0	37.62	0	9.077	0	-8.448
PISO1	B235	ENVOLVENTE MIN	0	0	3.43	0	2.054	0	-5.719
PISO1	B235	ENVOLVENTE MIN	1.31	0	7.83	0	2.054	0	-24.28
PISO1	B235	ENVOLVENTE MIN	2.62	0	12.24	0	2.054	0	-62.079
PISO1	B236	ENVOLVENTE MAX	0	0	-12.82	0	-1.4	0	-12.317
PISO1	B236	ENVOLVENTE MAX	1.63	0	-7.2	0	-1.4	0	6.091
PISO1	B236	ENVOLVENTE MAX	3.26	0	-1.58	0	-1.4	0	23.595
PISO1	B236	ENVOLVENTE MIN	0	0	-39.6	0	-8.466	0	-66.255
PISO1	B236	ENVOLVENTE MIN	1.63	0	-25.72	0	-8.466	0	-17.961
PISO1	B236	ENVOLVENTE MIN	3.26	0	-12.87	0	-8.466	0	0.681
PISO1	B237	ENVOLVENTE MAX	0	0	3.03	0	1.65	0	27.859
PISO1	B237	ENVOLVENTE MAX	1.31	0	8.94	0	1.65	0	29.465
PISO1	B237	ENVOLVENTE MAX	2.62	0	17.84	0	1.65	0	24.118
PISO1	B237	ENVOLVENTE MIN	0	0	-12.33	0	-0.539	0	3.683
PISO1	B237	ENVOLVENTE MIN	1.31	0	-4.93	0	-0.539	0	9.342
PISO1	B237	ENVOLVENTE MIN	2.62	0	-0.53	0	-0.539	0	-3.076
PISO1	B238	ENVOLVENTE MAX	0	0	14.22	0	9.71	0	18.347
PISO1	B238	ENVOLVENTE MAX	1.31	0	24.9	0	9.71	0	4.454
PISO1	B238	ENVOLVENTE MAX	2.62	0	35.62	0	9.71	0	-11.652
PISO1	B238	ENVOLVENTE MIN	0	0	3.46	0	2.288	0	-6.465
PISO1	B238	ENVOLVENTE MIN	1.31	0	7.87	0	2.288	0	-23.458
PISO1	B238	ENVOLVENTE MIN	2.62	0	12.27	0	2.288	0	-57.665
PISO1	B239	ENVOLVENTE MAX	0	0	-14.54	0	-1.555	0	-12.577
PISO1	B239	ENVOLVENTE MAX	1.63	0	-8.92	0	-1.555	0	6.959
PISO1	B239	ENVOLVENTE MAX	3.26	0	-3.31	0	-1.555	0	28.267
PISO1	B239	ENVOLVENTE MIN	0	0	-44.63	0	-7.739	0	-77.459
PISO1	B239	ENVOLVENTE MIN	1.63	0	-30.76	0	-7.739	0	-20.855
PISO1	B239	ENVOLVENTE MIN	3.26	0	-16.94	0	-7.739	0	3.423

PISO1	B241	ENVOLVENTE MIN	0	0	-0.91	0	1.741	0	-1.897
PISO1	B241	ENVOLVENTE MIN	1.31	0	3.49	0	1.741	0	-10.244
PISO1	B241	ENVOLVENTE MIN	2.62	0	7.9	0	1.741	0	-27.037
PISO1	B242	ENVOLVENTE MAX	0	0	7.79	0	-1.292	0	-1.451
PISO1	B242	ENVOLVENTE MAX	0.975	0	18.95	0	-1.292	0	-1.567
PISO1	B242	ENVOLVENTE MAX	1.95	0	31.53	0	-1.292	0	-5.664
PISO1	B242	ENVOLVENTE MIN	0	0	-3.65	0	-7.128	0	-7.411
PISO1	B242	ENVOLVENTE MIN	0.975	0	1.16	0	-7.128	0	-16.829
PISO1	B242	ENVOLVENTE MIN	1.95	0	5.97	0	-7.128	0	-42.011
PISO1	B243	ENVOLVENTE MAX	0	0	-23.21	0	0.914	0	-12.607
PISO1	B243	ENVOLVENTE MAX	1.63	0	-11.97	0	0.914	0	31.657
PISO1	B243	ENVOLVENTE MAX	3.26	0	-0.74	0	0.914	0	71.91
PISO1	B243	ENVOLVENTE MIN	0	0	-87.28	0	-1.478	0	-95.203
PISO1	B243	ENVOLVENTE MIN	1.63	0	-51.26	0	-1.478	0	-4.884
PISO1	B243	ENVOLVENTE MIN	3.26	0	-16.48	0	-1.478	0	13.57
PISO1	B244	ENVOLVENTE MAX	0	0	0.67	0	0.365	0	71.671
PISO1	B244	ENVOLVENTE MAX	1.31	0	14.51	0	0.365	0	75.393
PISO1	B244	ENVOLVENTE MAX	2.62	0	36.83	0	0.365	0	38.427
PISO1	B244	ENVOLVENTE MIN	0	0	-13.83	0	-1.171	0	14.565
PISO1	B244	ENVOLVENTE MIN	1.31	0	-0.87	0	-1.171	0	20.253
PISO1	B244	ENVOLVENTE MIN	2.62	0	6.94	0	-1.171	0	6.86
PISO1	B245	ENVOLVENTE MAX	0	0	40.51	0	-0.799	0	37.942
PISO1	B245	ENVOLVENTE MAX	1.31	0	64.65	0	-0.799	0	-0.58
PISO1	B245	ENVOLVENTE MAX	2.62	0	88.79	0	-0.799	0	-30.495
PISO1	B245	ENVOLVENTE MIN	0	0	8.7	0	-3.363	0	5.976
PISO1	B245	ENVOLVENTE MIN	1.31	0	16.51	0	-3.363	0	-28.374
PISO1	B245	ENVOLVENTE MIN	2.62	0	24.32	0	-3.363	0	-131.445
PISO1	B246	ENVOLVENTE MAX	0	0	-26.28	0	2.592	0	-34.718
PISO1	B246	ENVOLVENTE MAX	1.63	0	-15.04	0	2.592	0	2.914
PISO1	B246	ENVOLVENTE MAX	3.26	0	-3.81	0	2.592	0	48.988
PISO1	B246	ENVOLVENTE MIN	0	0	-92.9	0	0.324	0	-136.453
PISO1	B246	ENVOLVENTE MIN	1.63	0	-56.88	0	0.324	0	-10.243
PISO1	B246	ENVOLVENTE MIN	3.26	0	-20.87	0	0.324	0	10.727
PISO1	B247	ENVOLVENTE MAX	0	0	-2.2	0	0.724	0	49.998
PISO1	B247	ENVOLVENTE MAX	1.31	0	9.25	0	0.724	0	60.18
PISO1	B247	ENVOLVENTE MAX	2.62	0	31.9	0	0.724	0	29.676
PISO1	B247	ENVOLVENTE MIN	0	0	-16.39	0	-0.491	0	12.135
PISO1	B247	ENVOLVENTE MIN	1.31	0	-0.79	0	-0.491	0	16.756
PISO1	B247	ENVOLVENTE MIN	2.62	0	7.02	0	-0.491	0	4.479
PISO1	B248	ENVOLVENTE MAX	0	0	37.46	0	-0.87	0	29.259
PISO1	B248	ENVOLVENTE MAX	1.31	0	61.61	0	-0.87	0	-3.858
PISO1	B248	ENVOLVENTE MAX	2.62	0	85.75	0	-0.87	0	-33.97
PISO1	B248	ENVOLVENTE MIN	0	0	8.91	0	-3.564	0	3.609
PISO1	B248	ENVOLVENTE MIN	1.31	0	16.72	0	-3.564	0	-31.103
PISO1	B248	ENVOLVENTE MIN	2.62	0	24.53	0	-3.564	0	-132.15
PISO1	B249	ENVOLVENTE MAX	0	0	-29.09	0	2.435	0	-35.211
PISO1	B249	ENVOLVENTE MAX	1.63	0	-17.86	0	2.435	0	5.428
PISO1	B249	ENVOLVENTE MAX	3.26	0	-6.63	0	2.435	0	66.188
PISO1	B249	ENVOLVENTE MIN	0	0	-100.35	0	0.542	0	-143.538
PISO1	B249	ENVOLVENTE MIN	1.63	0	-64.33	0	0.542	0	-7.556
PISO1	B249	ENVOLVENTE MIN	3.26	0	-28.32	0	0.542	0	16.87
PISO1	B250	ENVOLVENTE MAX	0	0	-4.42	0	2.676	0	68.409
PISO1	B250	ENVOLVENTE MAX	1.31	0	3.39	0	2.676	0	92.565
PISO1	B250	ENVOLVENTE MAX	2.62	0	21.23	0	2.676	0	76.035
PISO1	B250	ENVOLVENTE MIN	0	0	-27.05	0	0.146	0	18.414
PISO1	B250	ENVOLVENTE MIN	1.31	0	-6.87	0	0.146	0	25.882
PISO1	B250	ENVOLVENTE MIN	2.62	0	2.2	0	0.146	0	15.438
PISO1	B251	ENVOLVENTE MAX	0	0	30.71	0	4.08	0	79.307
PISO1	B251	ENVOLVENTE MAX	1.31	0	54.86	0	4.08	0	33.786
PISO1	B251	ENVOLVENTE MAX	2.62	0	79	0	4.08	0	-4.214
PISO1	B251	ENVOLVENTE MIN	0	0	6.35	0	0.321	0	15.559
PISO1	B251	ENVOLVENTE MIN	1.31	0	14.16	0	0.321	0	-2.426
PISO1	B251	ENVOLVENTE MIN	2.62	0	21.97	0	0.321	0	-65.098
PISO1	B252	ENVOLVENTE MAX	0	0	7.54	0	9.214	0	-3.608
PISO1	B252	ENVOLVENTE MAX	0.975	0	18.71	0	9.214	0	-5.211
PISO1	B252	ENVOLVENTE MAX	1.95	0	32.48	0	9.214	0	-11.183
PISO1	B252	ENVOLVENTE MIN	0	0	-1.71	0	2.489	0	-13.236
PISO1	B252	ENVOLVENTE MIN	0.975	0	3.11	0	2.489	0	-22.531
PISO1	B252	ENVOLVENTE MIN	1.95	0	7.92	0	2.489	0	-49.231

PISO1	B254	ENVOLVENTE MIN	0	0	-12.44	0	-0.362	0	16.031
PISO1	B254	ENVOLVENTE MIN	1.31	0	-0.3	0	-0.362	0	22.101
PISO1	B254	ENVOLVENTE MIN	2.62	0	7.51	0	-0.362	0	8.265
PISO1	B255	ENVOLVENTE MAX	0	0	43.05	0	4.321	0	39.142
PISO1	B255	ENVOLVENTE MAX	1.31	0	67.19	0	4.321	0	-1.387
PISO1	B255	ENVOLVENTE MAX	2.62	0	91.33	0	4.321	0	-31.567
PISO1	B255	ENVOLVENTE MIN	0	0	9.93	0	0.868	0	6.712
PISO1	B255	ENVOLVENTE MIN	1.31	0	17.74	0	0.868	0	-29.409
PISO1	B255	ENVOLVENTE MIN	2.62	0	25.55	0	0.868	0	-136.889
PISO1	B256	ENVOLVENTE MAX	0	0	-27.78	0	-0.641	0	-36.877
PISO1	B256	ENVOLVENTE MAX	1.63	0	-16.5	0	-0.641	0	2.718
PISO1	B256	ENVOLVENTE MAX	3.26	0	-5.23	0	-0.641	0	54.42
PISO1	B256	ENVOLVENTE MIN	0	0	-96.74	0	-4.009	0	-142.991
PISO1	B256	ENVOLVENTE MIN	1.63	0	-60.56	0	-4.009	0	-10.079
PISO1	B256	ENVOLVENTE MIN	3.26	0	-24.37	0	-4.009	0	12.499
PISO1	B257	ENVOLVENTE MAX	0	0	-1.98	0	0.714	0	56.574
PISO1	B257	ENVOLVENTE MAX	1.31	0	10.41	0	0.714	0	64.181
PISO1	B257	ENVOLVENTE MAX	2.62	0	33.86	0	0.714	0	31.103
PISO1	B257	ENVOLVENTE MIN	0	0	-14.42	0	-0.346	0	14.314
PISO1	B257	ENVOLVENTE MIN	1.31	0	0.15	0	-0.346	0	18.261
PISO1	B257	ENVOLVENTE MIN	2.62	0	7.96	0	-0.346	0	5.108
PISO1	B258	ENVOLVENTE MAX	0	0	39.97	0	4.86	0	29.052
PISO1	B258	ENVOLVENTE MAX	1.31	0	64.11	0	4.86	0	-5.265
PISO1	B258	ENVOLVENTE MAX	2.62	0	88.25	0	4.86	0	-36.215
PISO1	B258	ENVOLVENTE MIN	0	0	10.02	0	1.103	0	3.528
PISO1	B258	ENVOLVENTE MIN	1.31	0	17.83	0	1.103	0	-34.587
PISO1	B258	ENVOLVENTE MIN	2.62	0	25.64	0	1.103	0	-138.913
PISO1	B259	ENVOLVENTE MAX	0	0	-30.33	0	-0.934	0	-37.278
PISO1	B259	ENVOLVENTE MAX	1.63	0	-19.06	0	-0.934	0	5.162
PISO1	B259	ENVOLVENTE MAX	3.26	0	-7.78	0	-0.934	0	73.417
PISO1	B259	ENVOLVENTE MIN	0	0	-105.34	0	-4.167	0	-152.042
PISO1	B259	ENVOLVENTE MIN	1.63	0	-69.16	0	-4.167	0	-7.538
PISO1	B259	ENVOLVENTE MIN	3.26	0	-32.98	0	-4.167	0	19.344
PISO1	B260	ENVOLVENTE MAX	0	0	-4.86	0	0.042	0	76.738
PISO1	B260	ENVOLVENTE MAX	1.31	0	2.95	0	0.042	0	101.197
PISO1	B260	ENVOLVENTE MAX	2.62	0	21	0	0.042	0	84.971
PISO1	B260	ENVOLVENTE MIN	0	0	-27.28	0	-1.847	0	21.394
PISO1	B260	ENVOLVENTE MIN	1.31	0	-6.74	0	-1.847	0	27.957
PISO1	B260	ENVOLVENTE MIN	2.62	0	2.43	0	-1.847	0	17.931
PISO1	B261	ENVOLVENTE MAX	0	0	37.52	0	0.96	0	88.544
PISO1	B261	ENVOLVENTE MAX	1.31	0	61.66	0	0.96	0	33.431
PISO1	B261	ENVOLVENTE MAX	2.62	0	85.81	0	0.96	0	-7.754
PISO1	B261	ENVOLVENTE MIN	0	0	8.85	0	-0.808	0	17.801
PISO1	B261	ENVOLVENTE MIN	1.31	0	16.66	0	-0.808	0	-1.608
PISO1	B261	ENVOLVENTE MIN	2.62	0	24.47	0	-0.808	0	-73.018
PISO2	B264	ENVOLVENTE MAX	0	0	-6.92	0	1.067	0	5.705
PISO2	B264	ENVOLVENTE MAX	4.25	0	5.47	0	1.067	0	13.122
PISO2	B264	ENVOLVENTE MAX	8.5	0	19.48	0	1.067	0	21.071
PISO2	B264	ENVOLVENTE MIN	0	0	-27.59	0	-1.762	0	-73.033
PISO2	B264	ENVOLVENTE MIN	4.25	0	-11.07	0	-1.762	0	8.059
PISO2	B264	ENVOLVENTE MIN	8.5	0	3.83	0	-1.762	0	-40.794
PISO2	B265	ENVOLVENTE MAX	0	0	-7.12	0	1.459	0	5.208
PISO2	B265	ENVOLVENTE MAX	4.25	0	5.27	0	1.459	0	14.149
PISO2	B265	ENVOLVENTE MAX	8.5	0	20.13	0	1.459	0	19.956
PISO2	B265	ENVOLVENTE MIN	0	0	-26.5	0	-1.255	0	-64.812
PISO2	B265	ENVOLVENTE MIN	4.25	0	-9.97	0	-1.255	0	9.057
PISO2	B265	ENVOLVENTE MIN	8.5	0	4.09	0	-1.255	0	-39.611
PISO2	B266	ENVOLVENTE MAX	0	0	-6.01	0	2.203	0	7.818
PISO2	B266	ENVOLVENTE MAX	4.25	0	6.38	0	2.203	0	11.923
PISO2	B266	ENVOLVENTE MAX	8.5	0	22.84	0	2.203	0	15.703
PISO2	B266	ENVOLVENTE MIN	0	0	-24.53	0	-0.934	0	-60.579
PISO2	B266	ENVOLVENTE MIN	4.25	0	-8	0	-0.934	0	6.533
PISO2	B266	ENVOLVENTE MIN	8.5	0	4.46	0	-0.934	0	-54.68
PISO2	B267	ENVOLVENTE MAX	0	0	-8.4	0	2.176	0	-2.476
PISO2	B267	ENVOLVENTE MAX	4.25	0	3.99	0	2.176	0	10.296
PISO2	B267	ENVOLVENTE MAX	8.5	0	17.26	0	2.176	0	23.25
PISO2	B267	ENVOLVENTE MIN	0	0	-28.84	0	-0.974	0	-81.45
PISO2	B267	ENVOLVENTE MIN	4.25	0	-12.32	0	-0.974	0	4.758
PISO2	B267	ENVOLVENTE MIN	8.5	0	3.33	0	-0.974	0	-36.417

PISO2	B269	ENVOLVENTE MIN	4.25	0	-8.69	0	-1.842	0	7.817
PISO2	B269	ENVOLVENTE MIN	8.5	0	4.46	0	-1.842	0	-45.609
PISO2	B274	ENVOLVENTE MAX	0	0	-8.8	0	-0.007	0	-8.609
PISO2	B274	ENVOLVENTE MAX	4.75	0	1.56	0	-0.007	0	28.714
PISO2	B274	ENVOLVENTE MAX	9.5	0	29.1	0	-0.007	0	-6.76
PISO2	B274	ENVOLVENTE MIN	0	0	-28.46	0	-0.221	0	-38.13
PISO2	B274	ENVOLVENTE MIN	4.75	0	-1.28	0	-0.221	0	8.964
PISO2	B274	ENVOLVENTE MIN	9.5	0	8.9	0	-0.221	0	-41.153
PISO2	B286	ENVOLVENTE MAX	0	0	2.23	0	3.441	0	-0.87
PISO2	B286	ENVOLVENTE MAX	1.375	0	9.45	0	3.441	0	-1.881
PISO2	B286	ENVOLVENTE MAX	2.75	0	17.78	0	3.441	0	-6.849
PISO2	B286	ENVOLVENTE MIN	0	0	-0.81	0	0.835	0	-2.973
PISO2	B286	ENVOLVENTE MIN	1.375	0	2.14	0	0.835	0	-10.232
PISO2	B286	ENVOLVENTE MIN	2.75	0	5.09	0	0.835	0	-28.947
PISO2	B287	ENVOLVENTE MAX	0	0	11.39	0	-0.258	0	6.629
PISO2	B287	ENVOLVENTE MAX	1.15	0	16.98	0	-0.258	0	-2.069
PISO2	B287	ENVOLVENTE MAX	2.3	0	23.79	0	-0.258	0	-7.41
PISO2	B287	ENVOLVENTE MIN	0	0	0.94	0	-3.963	0	0.435
PISO2	B287	ENVOLVENTE MIN	1.15	0	3.41	0	-3.963	0	-9.687
PISO2	B287	ENVOLVENTE MIN	2.3	0	5.88	0	-3.963	0	-32.935
PISO2	B288	ENVOLVENTE MAX	0	0	17.06	0	40.151	0	1.208
PISO2	B288	ENVOLVENTE MAX	1.15	0	24.51	0	40.151	0	-6.923
PISO2	B288	ENVOLVENTE MAX	2.3	0	31.97	0	40.151	0	-18.326
PISO2	B288	ENVOLVENTE MIN	0	0	1.53	0	6.562	0	-2.439
PISO2	B288	ENVOLVENTE MIN	1.15	0	7.12	0	6.562	0	-24.383
PISO2	B288	ENVOLVENTE MIN	2.3	0	12.71	0	6.562	0	-56.254
PISO2	B289	ENVOLVENTE MAX	0	0	0.81	0	-0.87	0	-0.835
PISO2	B289	ENVOLVENTE MAX	1.15	0	5.94	0	-0.87	0	-1.005
PISO2	B289	ENVOLVENTE MAX	2.3	0	12.82	0	-0.87	0	-3.221
PISO2	B289	ENVOLVENTE MIN	0	0	-2.23	0	-2.973	0	-3.441
PISO2	B289	ENVOLVENTE MIN	1.15	0	0.69	0	-2.973	0	-6.167
PISO2	B289	ENVOLVENTE MIN	2.3	0	3.16	0	-2.973	0	-16.907
PISO2	B290	ENVOLVENTE MAX	0	0	-8.14	0	-0.041	0	-6.064
PISO2	B290	ENVOLVENTE MAX	4.25	0	1.69	0	-0.041	0	23.474
PISO2	B290	ENVOLVENTE MAX	8.5	0	27.38	0	-0.041	0	-12.695
PISO2	B290	ENVOLVENTE MIN	0	0	-24.12	0	-0.265	0	-24.331
PISO2	B290	ENVOLVENTE MIN	4.25	0	0.24	0	-0.265	0	7.604
PISO2	B290	ENVOLVENTE MIN	8.5	0	9.35	0	-0.265	0	-38.167
PISO2	B291	ENVOLVENTE MAX	0	0	-8.97	0	0.083	0	-13.229
PISO2	B291	ENVOLVENTE MAX	4.25	0	0.29	0	0.083	0	15.589
PISO2	B291	ENVOLVENTE MAX	8.5	0	26.04	0	0.083	0	-14.037
PISO2	B291	ENVOLVENTE MIN	0	0	-25.46	0	-0.107	0	-37.904
PISO2	B291	ENVOLVENTE MIN	4.25	0	0.05	0	-0.107	0	5.361
PISO2	B291	ENVOLVENTE MIN	8.5	0	9.17	0	-0.107	0	-40.365
PISO2	B292	ENVOLVENTE MAX	0	0	-10.38	0	0.451	0	-14.726
PISO2	B292	ENVOLVENTE MAX	4.25	0	-1.27	0	0.451	0	28.552
PISO2	B292	ENVOLVENTE MAX	8.5	0	21.77	0	0.451	0	-2.399
PISO2	B292	ENVOLVENTE MIN	0	0	-29.73	0	0.081	0	-43.08
PISO2	B292	ENVOLVENTE MIN	4.25	0	-3.98	0	0.081	0	10.031
PISO2	B292	ENVOLVENTE MIN	8.5	0	7.54	0	0.081	0	-9.26
PISO2	B293	ENVOLVENTE MAX	0	0	-8.59	0	0.191	0	-9.511
PISO2	B293	ENVOLVENTE MAX	4.25	0	0.59	0	0.191	0	19.296
PISO2	B293	ENVOLVENTE MAX	8.5	0	25.9	0	0.191	0	-11.568
PISO2	B293	ENVOLVENTE MIN	0	0	-25.6	0	-0.067	0	-34.784
PISO2	B293	ENVOLVENTE MIN	4.25	0	-0.42	0	-0.067	0	6.031
PISO2	B293	ENVOLVENTE MIN	8.5	0	8.7	0	-0.067	0	-36.07
PISO2	B294	ENVOLVENTE MAX	0	0	-8.95	0	0.14	0	-12.616
PISO2	B294	ENVOLVENTE MAX	4.25	0	0.38	0	0.14	0	16.961
PISO2	B294	ENVOLVENTE MAX	8.5	0	26.13	0	0.14	0	-13.925
PISO2	B294	ENVOLVENTE MIN	0	0	-25.37	0	-0.107	0	-36.153
PISO2	B294	ENVOLVENTE MIN	4.25	0	0.11	0	-0.107	0	5.907
PISO2	B294	ENVOLVENTE MIN	8.5	0	9.23	0	-0.107	0	-39.371
PISO2	B295	ENVOLVENTE MAX	0	0	-9.8	0	0.053	0	-14.045
PISO2	B295	ENVOLVENTE MAX	4.25	0	-0.69	0	0.053	0	24.224
PISO2	B295	ENVOLVENTE MAX	8.5	0	23.06	0	0.053	0	-4.731
PISO2	B295	ENVOLVENTE MIN	0	0	-28.44	0	-0.255	0	-41.94
PISO2	B295	ENVOLVENTE MIN	4.25	0	-2.69	0	-0.255	0	8.244
PISO2	B295	ENVOLVENTE MIN	8.5	0	7.81	0	-0.255	0	-19.059
PISO2	B296	ENVOLVENTE MAX	0	0	5.58	0	1.816	0	-0.038

PISO2	B297	ENVOLVENTE MIN	0	0	-0.86	0	-0.623	0	-0.663
PISO2	B297	ENVOLVENTE MIN	0.375	0	-0.06	0	-0.623	0	-0.564
PISO2	B297	ENVOLVENTE MIN	0.75	0	0.74	0	-0.623	0	-1.816
PISO2	B298	ENVOLVENTE MAX	0	0	-2.56	0	10.02	0	-1.652
PISO2	B298	ENVOLVENTE MAX	0.375	0	-1.76	0	10.02	0	-0.84
PISO2	B298	ENVOLVENTE MAX	0.75	0	-0.96	0	10.02	0	0.919
PISO2	B298	ENVOLVENTE MIN	0	0	-15.92	0	2.004	0	-9.654
PISO2	B298	ENVOLVENTE MIN	0.375	0	-14.09	0	2.004	0	-4.028
PISO2	B298	ENVOLVENTE MIN	0.75	0	-12.27	0	2.004	0	-0.334
CUB1	B299	ENVOLVENTE MAX	0	13.9	-0.41	0.1	0.285	0.576	5.05
CUB1	B299	ENVOLVENTE MAX	4.25	13.9	1.54	0.1	0.285	0.164	2.761
CUB1	B299	ENVOLVENTE MAX	8.5	13.9	3.49	0.1	0.285	0.117	-2.703
CUB1	B299	ENVOLVENTE MIN	0	2.11	-1.36	-0.01	0.034	0.006	-0.448
CUB1	B299	ENVOLVENTE MIN	4.25	2.11	0.27	-0.01	0.034	0.06	1.535
CUB1	B299	ENVOLVENTE MIN	8.5	2.11	1.73	-0.01	0.034	-0.309	-8.048
CUB1	B300	ENVOLVENTE MAX	0	36.46	-0.94	0.03	0.067	0.097	0.896
CUB1	B300	ENVOLVENTE MAX	4.25	36.46	0.91	0.03	0.067	-0.013	1.417
CUB1	B300	ENVOLVENTE MAX	8.5	36.46	2.87	0.03	0.067	0.323	-2.522
CUB1	B300	ENVOLVENTE MIN	0	9.79	-1.81	-0.08	-0.079	-0.381	-1.962
CUB1	B300	ENVOLVENTE MIN	4.25	9.79	0.07	-0.08	-0.079	-0.039	0.864
CUB1	B300	ENVOLVENTE MIN	8.5	9.79	1.53	-0.08	-0.079	-0.133	-6.879
CUB1	B301	ENVOLVENTE MAX	0	68.52	0.37	0.04	-0.011	0.143	5.303
CUB1	B301	ENVOLVENTE MAX	4.25	68.52	2.32	0.04	-0.011	-0.001	0.959
CUB1	B301	ENVOLVENTE MAX	8.5	68.52	4.27	0.04	-0.011	0.11	-3.225
CUB1	B301	ENVOLVENTE MIN	0	18.37	-1.21	-0.03	-0.174	-0.195	-1.082
CUB1	B301	ENVOLVENTE MIN	4.25	18.37	0.25	-0.03	-0.174	-0.067	-0.408
CUB1	B301	ENVOLVENTE MIN	8.5	18.37	1.72	-0.03	-0.174	-0.193	-14.412
CUB1	B302	ENVOLVENTE MAX	0	-1.44	-0.54	0.02	0.073	0.005	3.524
CUB1	B302	ENVOLVENTE MAX	4.25	-1.44	1.21	0.02	0.073	-0.043	2.532
CUB1	B302	ENVOLVENTE MAX	8.5	-1.44	3.16	0.02	0.073	0.187	-1.029
CUB1	B302	ENVOLVENTE MIN	0	-7.78	-1.84	-0.07	-0.19	-0.392	-2.55
CUB1	B302	ENVOLVENTE MIN	4.25	-7.78	-0.18	-0.07	-0.19	-0.137	1.322
CUB1	B302	ENVOLVENTE MIN	8.5	-7.78	1.29	-0.07	-0.19	-0.126	-6.756
CUB1	B303	ENVOLVENTE MAX	0	5.7	-1.01	0.07	0.128	0.326	-0.173
CUB1	B303	ENVOLVENTE MAX	4.25	5.7	0.54	0.07	0.128	0.024	1.521
CUB1	B303	ENVOLVENTE MAX	8.5	5.7	2.49	0.07	0.128	0.118	-0.906
CUB1	B303	ENVOLVENTE MIN	0	0.91	-2.16	-0.02	-0.102	-0.092	-3.775
CUB1	B303	ENVOLVENTE MIN	4.25	0.91	-0.29	-0.02	-0.102	0.007	0.952
CUB1	B303	ENVOLVENTE MIN	8.5	0.91	1.17	-0.02	-0.102	-0.292	-5.148
CUB1	B304	ENVOLVENTE MAX	0	33.46	-0.16	0.06	0.164	0.262	3.141
CUB1	B304	ENVOLVENTE MAX	4.25	33.46	1.79	0.06	0.164	0.011	1.137
CUB1	B304	ENVOLVENTE MAX	8.5	33.46	3.74	0.06	0.164	0.023	-0.751
CUB1	B304	ENVOLVENTE MIN	0	4.95	-1.75	-0.01	-0.072	-0.081	-3.196
CUB1	B304	ENVOLVENTE MIN	4.25	4.95	-0.29	-0.01	-0.072	-0.039	-0.31
CUB1	B304	ENVOLVENTE MIN	8.5	4.95	1.18	-0.01	-0.072	-0.258	-12.055
CUB1	B305	ENVOLVENTE MAX	0	0	-0.71	0.04	0.024	0.164	2.052
CUB1	B305	ENVOLVENTE MAX	4.25	0	0.86	0.04	0.024	0	2.53
CUB1	B305	ENVOLVENTE MAX	8.5	0	2.82	0.04	0.024	-0.004	-0.423
CUB1	B305	ENVOLVENTE MIN	0	-0.7	-2.17	0	-0.002	-0.014	-3.243
CUB1	B305	ENVOLVENTE MIN	4.25	-0.7	-0.33	0	-0.002	-0.011	1.278
CUB1	B305	ENVOLVENTE MIN	8.5	-0.7	1.13	0	-0.002	-0.168	-5.288
CUB1	B306	ENVOLVENTE MAX	0	0.16	-1.07	0.03	0.01	0.122	-0.484
CUB1	B306	ENVOLVENTE MAX	4.25	0.16	0.45	0.03	0.01	-0.002	1.454
CUB1	B306	ENVOLVENTE MAX	8.5	0.16	2.4	0.03	0.01	-0.001	-0.857
CUB1	B306	ENVOLVENTE MIN	0	-0.48	-2.22	0	-0.009	-0.003	-4.019
CUB1	B306	ENVOLVENTE MIN	4.25	-0.48	-0.31	0	-0.009	-0.008	0.925
CUB1	B306	ENVOLVENTE MIN	8.5	-0.48	1.15	0	-0.009	-0.134	-4.777
CUB1	B307	ENVOLVENTE MAX	0	0.57	-1	0.03	0.006	0.132	-0.071
CUB1	B307	ENVOLVENTE MAX	4.25	0.57	0.49	0.03	0.006	0.007	2.198
CUB1	B307	ENVOLVENTE MAX	8.5	0.57	2.44	0.03	0.006	0.031	1.338
CUB1	B307	ENVOLVENTE MIN	0	-0.35	-2.57	-0.01	-0.013	-0.019	-4.576
CUB1	B307	ENVOLVENTE MIN	4.25	-0.35	-0.64	-0.01	-0.013	-0.009	1.075
CUB1	B307	ENVOLVENTE MIN	8.5	-0.35	0.82	-0.01	-0.013	-0.149	-4.662

7.8.1 Fuerza en columnas

Story	Column	Load	Loc	P	V2	V3	T	M2	M3
CUB1	C39	ENVOLVENTE MAX	0	-0.15	1.12	2.12	0.075	1.663	2.707
CUB1	C39	ENVOLVENTE MAX	1.085	0.23	1.12	2.12	0.075	0.222	1.494
CUB1	C39	ENVOLVENTE MAX	2.17	0.6	1.12	2.12	0.075	1.606	22.494
CUB1	C39	ENVOLVENTE MIN	0	-21.86	-23.64	-1.57	-0.047	-1.895	-28.8
CUB1	C39	ENVOLVENTE MIN	1.085	-21.36	-23.64	-1.57	-0.047	-1.053	-3.153
CUB1	C39	ENVOLVENTE MIN	2.17	-20.86	-23.64	-1.57	-0.047	-3.033	0.282
CUB1	C40	ENVOLVENTE MAX	0	-7.11	-0.76	2.12	0.087	2.034	0.524
CUB1	C40	ENVOLVENTE MAX	1.085	-6.74	-0.76	2.12	0.087	1.022	1.351
CUB1	C40	ENVOLVENTE MAX	2.17	-6.36	-0.76	2.12	0.087	3.811	25.981
CUB1	C40	ENVOLVENTE MIN	0	-42.1	-27.06	-2.61	-0.015	-1.967	-32.73
CUB1	C40	ENVOLVENTE MIN	1.085	-41.6	-27.06	-2.61	-0.015	-0.422	-3.375
CUB1	C40	ENVOLVENTE MIN	2.17	-41.1	-27.06	-2.61	-0.015	-2.678	2.178
CUB1	C41	ENVOLVENTE MAX	0	-6.08	1.18	2.16	0.109	1.864	3.065
CUB1	C41	ENVOLVENTE MAX	1.085	-5.71	1.18	2.16	0.109	0.81	1.787
CUB1	C41	ENVOLVENTE MAX	2.17	-5.34	1.18	2.16	0.109	3.756	27.915
CUB1	C41	ENVOLVENTE MIN	0	-41.28	-29.42	-2.75	-0.004	-2.255	-35.93
CUB1	C41	ENVOLVENTE MIN	1.085	-40.78	-29.42	-2.75	-0.004	-0.554	-4.007
CUB1	C41	ENVOLVENTE MIN	2.17	-40.28	-29.42	-2.75	-0.004	-2.854	0.51
CUB1	C42	ENVOLVENTE MAX	0	-0.23	5.12	1.64	0.14	2.403	8.2
CUB1	C42	ENVOLVENTE MAX	1.085	0.14	5.12	1.64	0.14	1.414	2.644
CUB1	C42	ENVOLVENTE MAX	2.17	0.52	5.12	1.64	0.14	3.344	28.813
CUB1	C42	ENVOLVENTE MIN	0	-26.93	-31.22	-2.09	-0.026	-1.453	-38.935
CUB1	C42	ENVOLVENTE MIN	1.085	-26.43	-31.22	-2.09	-0.026	0.023	-5.061
CUB1	C42	ENVOLVENTE MIN	2.17	-25.94	-31.22	-2.09	-0.026	-1.42	-2.913
PISO2	C43	ENVOLVENTE MAX	0	-97.99	14.87	7.65	5.354	0.658	-15.475
PISO2	C43	ENVOLVENTE MAX	1.75	-88.92	14.87	7.65	5.354	13.438	10.531
PISO2	C43	ENVOLVENTE MAX	3.5	-79.85	14.87	7.65	5.354	45.274	108.161
PISO2	C43	ENVOLVENTE MIN	0	-251.64	-74.02	-26.37	-6.137	-52.481	-155.428
PISO2	C43	ENVOLVENTE MIN	1.75	-239.54	-74.02	-26.37	-6.137	-32.125	-77.926
PISO2	C43	ENVOLVENTE MIN	3.5	-227.45	-74.02	-26.37	-6.137	-31.198	-72.048
PISO1	C43	ENVOLVENTE MAX	0	-386.58	100.92	71.27	5.948	170.465	279.483
PISO1	C43	ENVOLVENTE MAX	2	-376.21	100.92	71.27	5.948	31.455	77.972
PISO1	C43	ENVOLVENTE MAX	4	-365.84	100.92	71.27	5.948	162.598	231.259
PISO1	C43	ENVOLVENTE MIN	0	-1110.23	-164.83	-94.87	-6.257	-216.913	-428.453
PISO1	C43	ENVOLVENTE MIN	2	-1096.41	-164.83	-94.87	-6.257	-30.699	-99.113
PISO1	C43	ENVOLVENTE MIN	4	-1082.59	-164.83	-94.87	-6.257	-114.638	-124.57
PISO2	C44	ENVOLVENTE MAX	0	-81	71.85	0.71	5.354	-22.912	166.007
PISO2	C44	ENVOLVENTE MAX	1.75	-71.93	71.85	0.71	5.354	-0.977	77.458
PISO2	C44	ENVOLVENTE MAX	3.5	-62.86	71.85	0.71	5.354	43.038	56.031
PISO2	C44	ENVOLVENTE MIN	0	-185.97	-7.85	-39.45	-6.137	-109.103	23.378
PISO2	C44	ENVOLVENTE MIN	1.75	-173.87	-7.85	-39.45	-6.137	-55.604	-4.945
PISO2	C44	ENVOLVENTE MIN	3.5	-161.78	-7.85	-39.45	-6.137	-31.822	-95.522
PISO1	C44	ENVOLVENTE MAX	0	-271.06	169.64	57.95	5.948	149.084	342.51
PISO1	C44	ENVOLVENTE MAX	2	-260.69	169.64	57.95	5.948	42.493	49.994
PISO1	C44	ENVOLVENTE MAX	4	-250.33	169.64	57.95	5.948	213.298	79.267
PISO1	C44	ENVOLVENTE MIN	0	-761.32	-99.3	-112.87	-6.257	-238.193	-318.282
PISO1	C44	ENVOLVENTE MIN	2	-747.49	-99.3	-112.87	-6.257	-21.758	-166.433
PISO1	C44	ENVOLVENTE MIN	4	-733.67	-99.3	-112.87	-6.257	-82.72	-336.375
CUB1	C43-1	ENVOLVENTE MAX	0	-40.1	-31.72	-7.84	0.593	-3.015	-7.676
CUB1	C43-1	ENVOLVENTE MAX	0.398	-39.97	-31.72	-7.84	0.593	0.105	4.945
CUB1	C43-1	ENVOLVENTE MAX	0.796	-39.83	-31.72	-7.84	0.593	7.9	32.391
CUB1	C43-1	ENVOLVENTE MIN	0	-115.1	-112.69	-25.72	0.004	-12.561	-64.006
CUB1	C43-1	ENVOLVENTE MIN	0.398	-114.92	-112.69	-25.72	0.004	-2.968	-21.029
CUB1	C43-1	ENVOLVENTE MIN	0.796	-114.73	-112.69	-25.72	0.004	2.88	8.117
CUB1	C44-1	ENVOLVENTE MAX	0	-30.85	78.26	-4.9	1.22	0.963	29.598
CUB1	C44-1	ENVOLVENTE MAX	0.148	-30.8	78.26	-4.9	1.22	2.301	18.392
CUB1	C44-1	ENVOLVENTE MAX	0.296	-30.75	78.26	-4.9	1.22	3.665	7.862
CUB1	C44-1	ENVOLVENTE MIN	0	-87.96	24.94	-11.46	0.157	-1.874	-1.399
CUB1	C44-1	ENVOLVENTE MIN	0.148	-87.89	24.94	-11.46	0.157	-0.823	-5.169
CUB1	C44-1	ENVOLVENTE MIN	0.296	-87.82	24.94	-11.46	0.157	0.202	-9.615
PISO2	C45	ENVOLVENTE MAX	0	-98.03	-0.76	25.4	5.354	37.229	-48.57
PISO2	C45	ENVOLVENTE MAX	1.75	-88.96	-0.76	25.4	5.354	10.323	-12.733
PISO2	C45	ENVOLVENTE MAX	3.5	-79.89	-0.76	25.4	5.354	76.88	74.645
PISO2	C45	ENVOLVENTE MIN	0	-216.64	-78.78	-38.42	-6.137	-57.798	-229.839
PISO2	C45	ENVOLVENTE MIN	1.75	-204.54	-78.78	-38.42	-6.137	-8.102	-103.749
PISO2	C45	ENVOLVENTE MIN	3.5	-192.44	-78.78	-38.42	-6.137	-51.87	-49.036
PISO1	C45	ENVOLVENTE MAX	0	-435.25	52.18	85.19	5.948	188.769	166.048

PISO1	C50	ENVOLVENTE MIN	4	-473.76	-47.56	-56.88	-6.257	-239.876	-209.247
CUB1	C49-1	ENVOLVENTE MAX	0	-23.89	-32.34	-2.51	1.329	-0.687	-11.757
CUB1	C49-1	ENVOLVENTE MAX	0.398	-23.75	-32.34	-2.51	1.329	0.38	1.113
CUB1	C49-1	ENVOLVENTE MAX	0.796	-23.61	-32.34	-2.51	1.329	2.755	26.545
CUB1	C49-1	ENVOLVENTE MIN	0	-63.53	-91.25	-15.35	0.166	-10.07	-46.96
CUB1	C49-1	ENVOLVENTE MIN	0.398	-63.35	-91.25	-15.35	0.166	-4.804	-14.066
CUB1	C49-1	ENVOLVENTE MIN	0.796	-63.16	-91.25	-15.35	0.166	-1.264	7.637
CUB1	C50-1	ENVOLVENTE MAX	0	-12.6	37.65	3.38	-0.562	1.642	9.558
CUB1	C50-1	ENVOLVENTE MAX	0.148	-12.55	37.65	3.38	-0.562	1.143	5.037
CUB1	C50-1	ENVOLVENTE MAX	0.296	-12.5	37.65	3.38	-0.562	0.644	2.282
CUB1	C50-1	ENVOLVENTE MIN	0	-44.34	17.95	-7.64	-2.957	-8.086	-1.288
CUB1	C50-1	ENVOLVENTE MIN	0.148	-44.27	17.95	-7.64	-2.957	-6.956	-4.362
CUB1	C50-1	ENVOLVENTE MIN	0.296	-44.21	17.95	-7.64	-2.957	-5.827	-9.203

7.9 VERIFICACIONES: CORTANTE C.21.3.3 (A) Y (B)

NIVEL	VIGA / ELEMENTO No.	LOC. (m)	LONG. (m)	PROPIEDADES DEL ELEMENTO: SECCION	b (m)	d (m)	M3: C.M. (KN.m)	C.V. (KN.m)	SISMO X (KN.m)	SISMO Y (KN.m)	-SISMO X (KN.m)	-SISMO Y (KN.m)	Mn (kN.m) Combinaciones para resistencias nominales a momento: COMBDIS3	COMBDIS4	COMBDIS5	COMBDIS6	COMBDIS7	COMBDIS8	COMBDIS9	COMBDIS10	COMBDIS11	COMBDIS12	COMBDIS13	COMBDIS14	COMBDIS15	COMBDIS16	COMBDIS17	COMBDIS18
PISO2	B137	0.000	9.500	V30X60X45	0.30	0.40	-48.963	-27.894	32.570	8.092	32.570	8.092	75.272	3.067	54.953	49.097	64.108	89.328	108.879	73.818	135.242	150.133	198.373	241.492	244.534	270.211	371.939	448.900
	B137	9.500					-11.949	-2.053	27.737	7.176	27.737	7.176	9.790	28.669	47.103	38.596	44.547	27.912	53.457	93.052	106.879	100.628	99.451	114.758	187.660	247.533	258.633	258.217
PISO1	B137	0.000	9.500	V30X60X45	0.30	0.40	-137.676	-108.555	62.276	15.182	-32.570	-8.092	255.915	63.188	82.136	0.911	13.906	265.722	388.999	159.091	120.279	99.956	379.371	750.837	698.802	358.492	378.652	710.091
	B137	9.500					-94.718	-71.550	62.920	21.038	13.334	5.685	169.827	17.276	99.884	51.165	60.583	187.169	246.776	136.144	196.967	180.026	323.785	514.764	488.047	421.931	522.656	686.744
PISO2	B143	0.000	2.750	V30X60X45	0.50	0.40	1.490	0.731	1.353	0.387	0.158	1.066	2.844	2.322	2.157	1.225	2.042	5.863	6.295	5.412	4.858	6.135	11.154	14.889	14.456	13.489	15.434	22.762
	B143	2.750					-10.880	-7.058	3.365	0.979	21.178	4.940	19.301	3.475	10.053	24.757	34.874	26.671	30.519	22.048	46.328	72.521	76.772	70.512	73.798	94.016	149.876	184.387
PISO1	B143	0.000	2.750	V30X60X45	0.50	0.40	1.932	1.835	0.527	0.451	62.920	21.038	4.301	7.024	16.468	58.423	97.966	32.205	20.406	46.633	112.102	188.591	157.408	76.888	108.604	220.464	363.218	408.043
	B143	2.750					-65.030	-40.793	6.885	7.549	-12.709	-5.273	114.974	42.036	11.675	2.976	8.273	120.766	185.197	63.332	26.876	51.028	176.070	345.982	294.943	125.952	145.471	333.855
PISO1	B144	0.000	1.200	V30X60X45	0.50	0.40	-13.954	-5.951	3.928	2.574	-13.334	-5.685	24.051	3.530	3.945	0.905	16.506	18.277	33.929	11.498	19.437	34.315	45.907	59.703	58.778	43.871	71.822	104.275
	B144	1.200					3.203	3.380	1.064	0.261	-21.662	-5.007	7.477	3.733	3.814	21.963	29.115	2.539	14.974	14.919	32.959	57.057	41.800	23.534	44.016	66.329	107.466	116.432
PISO2	B146	0.000	9.500	V30X60X45	0.30	0.40	-58.284	-38.628	33.267	3.629	-21.178	-4.940	100.934	13.692	38.514	11.192	7.011	100.616	144.118	57.899	65.674	52.408	144.916	282.102	248.928	158.460	182.228	287.091
	B146	9.500					-20.499	-10.246	28.247	2.995	1.006	0.306	28.368	16.884	37.125	6.559	8.929	34.919	59.416	59.210	55.434	28.521	62.785	118.171	144.728	137.009	116.872	132.919
PISO1	B146	0.000	9.500	V30X60X45	0.30	0.40	-234.518	-214.027	61.966	9.045	3.365	0.879	481.075	192.632	84.217	46.508	124.763	530.672	791.738	394.029	210.873	351.284	878.600	1516.818	1354.349	748.143	900.457	1727.502
	B146	9.500					-190.137	-177.185	63.354	6.678	6.085	7.549	390.826	147.378	84.558	41.831	111.526	436.272	637.948	278.143	197.303	301.648	732.413	1238.838	1107.636	646.935	783.759	1443.530
PISO2	B149	0.000	9.500	V30X60X45	0.30	0.40	-58.883	-39.136	41.954	3.802	-0.527	-0.451	100.219	4.199	56.000	10.616	21.467	104.211	137.170	62.829	87.134	66.510	164.643	281.994	251.230	188.285	226.457	323.869
	B149	9.500					-19.051	-9.042	35.417	2.974	3.928	2.574	23.834	25.489	46.519	9.658	14.283	35.689	65.072	80.205	71.034	38.142	72.636	130.458	176.619	180.598	148.221	159.172
PISO1	B149	0.000	9.500	V30X60X45	0.30	0.40	-230.768	-211.472	80.358	8.795	2.495	1.350	469.950	171.288	106.869	44.679	120.196	516.492	761.733	329.356	232.878	339.404	852.199	1470.478	1317.813	760.341	906.268	1674.082
	B149	9.500					-184.977	-173.076	82.503	7.256	8.415	0.958	376.231	123.015	108.193	42.417	102.864	411.930	601.362	272.095	222.570	285.355	687.142	1170.982	1062.216	658.354	783.243	1360.649
PISO2	B152	0.000	9.500	V30X60X45	0.30	0.40	-51.582	-33.256	55.560	8.108	2.007	0.207	82.235	17.588	75.242	17.265	22.062	91.404	134.137	101.663	118.549	72.034	154.463	274.315	293.764	266.827	266.905	321.446
	B152	9.500					-10.377	-1.197	47.336	7.464	-8.415	-0.958	2.633	46.896	62.332	0.504	7.338	16.082	64.045	119.329	76.006	15.786	47.074	115.058	214.565	227.847	127.525	105.891
PISO1	B152	0.000	9.500	V30X60X45	0.30	0.40	-193.661	-163.999	111.210	11.481	-2.007	-0.207	370.913	83.171	144.473	36.452	88.355	398.779	562.803	258.069	268.373	255.234	643.476	1115.751	1007.198	664.673	770.057	1264.840
	B152	9.500					-137.658	-118.777	112.891	28.613	19.399	3.154	256.972	21.990	168.603	71.567	85.004	276.884	372.595	215.562	311.240	257.253	476.125	773.730	749.990	660.023	788.128	1006.768
PISO1	B158	0.000	1.200	V30X60X45	0.50	0.40	-42.202	-23.813	6.858	3.046	18.635	3.246	72.773	19.998	16.393	27.863	43.113	82.138	112.604	48.457	61.391	102.308	162.127	226.031	204.045	153.084	227.075	346.730
	B158	1.200					6.338	6.152	1.538	0.229	-61.966	-9.045	14.115	4.840	12.299	62.760	79.945	5.156	28.695	37.383	95.628	158.356	109.959	49.585	103.622	183.000	300.809	317.861
PISO2	B159	0.000	2.750	V30X60X45	0.50	0.40	2.964	1.820	1.387	0.142	-10.829	-1.948	5.894	2.861	0.730	10.712	13.465	4.046	10.590	7.466	14.854	27.945	23.079	18.095	25.338	31.562	52.105	62.323
	B159	2.750					-17.311	-11.954	3.435	0.346	-0.087	-1.554	31.941	10.839	4.345	2.112	6.162	32.774	50.274	18.232	10.881	19.332	52.556	94.380	82.247	40.558	50.360	102.212
PISO1	B159	0.000	2.750	V30X60X45	0.50	0.40	6.695	5.924	0.138	0.409	-19.399	-3.154	14.016	6.044	3.947	18.675	22.915	11.837	24.986	16.877	29.292	49.621	46.013	44.894	58.678	63.639	97.990	119.313
	B159	2.750					-128.106	-98.692	9.816	3.580	-63.354	-6.678	249.999	112.042	0.835	43.875	19.678	266.940	415.152	148.348	67.047	159.325	392.566	772.471	670.052	304.241	378.516	800.086
PISO2	B163	0.000	2.750	V30X60X45	0.50	0.40	2.744	1.627	1.887	0.126	41.354	3.802	5.303	6.464	11.727	41.304	55.758	12.084	18.321	32.824	70.572	111.627	85.281	44.821	77.934	140.450	218.246	234.389
	B163	2.750					-16.595	-11.329	4.136	0.290	2.448	0.165	30.305	9.231	5.808	4.853	10.452	32.941	47.211	18.661	16.342	26.746	57.219	91.977	80.728	48.492	65.201	115.133
PISO1	B163	0.000	2.750	V30X60X45	0.50	0.40	6.323	5.666	0.179	0.159	35.417	2.574	13.304	9.375	8.443	37.158	49.056	19.519	29.693	31.219	59.489	99.960	87.065	84.019	86.734	124.970	194.962	227.026
	B163	2.750					-119.930	-92.809	12.488	1.282	-10.707	-1.065	233.853	99.315	13.814	6.185	44.675	258.566	383.420	137.344	49.727	134.451	403.537	723.936	617.462	271.320	332.060	766.926
PISO1	B164	0.000	1.200	V30X60X45	0.50	0.40	-40.662	-22.629	8.404	0.866	-2.448	-0.165	69.498	18.722	10.396	3.188	13.590	74.154	104.642	34.476	23.626	40.870	116.013	202.863	168.021	81.814	108.526	221.329
	B164	1.200					6.341	6.208	1.992	0.307	80.358	8.795	14.280	14.887	21.141	83.833	105.389	29.548	42.277	64.859	138.281	219.133	174.533	101.166	160.263	273.444	427.000	470.659
PISO1	B168	0.000	1.200	V30X60X45	0.50	0.40	-29.346	-15.062	15.016	7.669	14.199	1.023	46.429	0.408	28.912	26.724	28.407	49.675	64.329	37.233	71.043	78.803	100.540	136.949	135.269	139.271	192.527	230.955
	B168	1.200					4.884	4.287	2.825	0.946	0.046	0.675	10.839	8.183	4.391	2.054	3.684	13.760	22.302	14.912	9.059	10.693	24.131	42.791	44.401	30.939	29.776	49.419
PISO2	B169	0.000	2.750	V35X60X45	0.50	0.40	2.530	1.576	2.496	0.526	25.569	2.979	5.202	6.182	9.313	26.809	34.750	10.771	16.281	25.006	46.425	70.400	57.756	37.858	59.553	95.926	141.468	154.619
	B169	2.750					-13.376	-9.161	6.808	1.340	82.503	7.256	23.608	1.613	26.327	87.297	111.813	34.582	42.057	57.103	148.297	226.854	181.850	106.113	155.672	279.443	452.372	487.834
PISO1	B169	0.000	2.750	V30X60X45	0.50	0.40	5.400	4.377	0.117	1.159	-80.358	-8.795	10.960	0.270	17.144	80.191	102.771	1.609	22.578	42.140	123.709	200.863	132.761	42.121	110.115	227.764	381.625	390.498
	B169	2.750					-120.512	-86.956	20.558	14.055	-15.385	-1.091	225.932	81.250	37.229	18.701	36.071	248.161	361.889	141.290	87.736	137.118	378.285	693.328	604.194	312.973	372.686	737.179
PISO1	B173	0.000	9.500	V30X20X45	0.20	0.40	-49.619	-47.032	13.560	4.618	-0.046	-0.675	103.254	41.855	20.835	12.229	25.005	113.134	171.205	75.446	50.330	76.228	186.215	327.088	297.158	170.220	199.818	370.194
	B173	9.500					-28.118	-28.614	12.687	7.601	3.539	0.841	59.032	19.727	23.668	16.763	19.521	66.002	96.943	52.371	53.922	60.790	114.462	191.379	184.739	137.908	163.691	242.255
PISO1	B174	0.000	2.750	V30X20X45	0.20	0.40	-2.240	-2.030	0.195	1.299	47.335	7.464	4.588	1.203	12.549	50.858	65.366	14.649	12.888	29.653	81.420	130.510	97.929	42.485	71.913	152.535	252.809	268.776
	B174	2.750					-32.965	-29.218	4.725	5.325	-13.608	-1.747	87.371	30.260	7.855	3.115	1.101	72.478	112.859	44.693	17.617	28.469	101.859	210.829	185.928	84.365	86.307	195.293
PISO1	B175	0.000	1.200	V30X20X45	0.20	0.40	-6.781	-5.631	3.365	5.742	-3.539	-0.841	12.638	2.352	8.937	4.007	2.123	12.747	19.771	12.792	16.053	11.082	20.540	38.980	40.823	35.236	37.509	45.222
	B175	1.200					-2.424	-2.495	0.802	0.631	111.210	11.481	5.184	5.362	27.072	114.864	146.442	21.957	25.256	68.755	181.357	290.842	207.887	78.983	158.793	342.402	559.934	585.036
PISO1	B176	0.000	9.500	V30X20X45	0.20	0.40	-56.763	-55.646	13.098	6.418	19.639	9.125	120.423	50.942	27.108	37.297	62.849	144.501	203.967	100.738	93.526	193.434	271.961	495.989	376.511	266.639	353.166	571.401
	B176	9.500					-32.904	-34.827	11.755	4.458	-111.210	-11.481	71.402	36.461	6.915	103.652	126.635	66.189	130.590	82.144	144.503	274.432	252.647	237.904	289.259	520.903	519.839	654.116
PISO1	B177	0.000	2.750	V30X20X45	0.20	0.40	-2.808	-2.538	0.174	1.253	-19.639	-9.125	5.785	3.902	3.511	19.777	31.146	4.063	12.944	14.665	31.183	56.645	45.293	23.157	40.903	64.388	108.673	121.139
	B177	2.750					-38.052	-34.484	4.681	5.706	-0.408	-4.855	78.726	35.459	10.909	10.609	14.514	81.507	133.061	56.788	32.358	54.228	132.278	248.646	227.264	121.369	138.829	267.091
PISO1	B178	0.000	1.200	V30X20X45	0.20	0.40	-5.633	-4.887	2.765	4.731	-35.482	-3.646	10.717	6.414	0.079	29.901	43.549	7.328	19.285	14.923	40.161	82.343	64.866	34.071	52.479	80.692	147.223	176.748
	B178	1.200					-1.587	-3.616	0.850	0.762	-112.891	-28.413	7.681	10.846	25.212	117.823	161.652	22.564	33.520	75.187	185.935	310.289	229.008	89.672	177.321	359.950	589.764	633.103
PISO1	B179	0.000	9.500	V30X20X45	0.20	0.40	-56.400	-54.284	14.512	4.808	6.658	3.046	118.429	49.116	23.905	21.000	40.628	134.593	197.944	90.220	67.667	108.933	233.348	384.017	350.088	215.715	267.614	472.743
	B179	9.500					-30.017	-30.952	13.774	5.287	1.387	0.142	63.589	22.101	22.133	12.000	17.404	70.116	104.090	52.482	47.102	54.325	117.631	203.033	191.479	129.995	150.524	240.705
PISO1	B180	0.000	1.200	V30X20X45	0.20	0.40	-5.916	-5.379	4.209	5.849	1.024	0.102	11.153	0.878	11.134	8.809	3.868	12.213	17.323	14.403	23.844	18.307	21.664	36.768	41.709	46.640	54.185	54.584
	B180	1.200					-3.190	-3.025	0.699	0.908	-1.387	-0.142	6.637	2.822	1.429	0.114	0.143	7.189	11.111	4.880	2.340	2.618	10.154	20.972	18.878	9.418	9.080	19.214
PISO1	B181	0.000	2.750	V30X20X45	0.20	0.40	-3.074	-2.730	0.050	1.473	-1.024	-0.102	6.309	2.967	1.299	1.142	0.269	6.933	10.903	5.131	3.222	3.907	10.021	20.578	19.191	10.915	11.372	20.561
	B181	2.750					-39.428	-35.529	5.245	5.145	0.138	0.409	81.334	36.237	11.497	11.825	21.065	90.644	137.181	59.014	36.345	64.543	130.341	261.491	236.011	131.528	159.000	301.636

f'c =	**21.1**	MPa
fy =	**420**	MPa
Φ Cortante =	**0.75**	
Estribos Φ =	**9.5**	mm
Av =	**71**	mm^2
R=	**4.50**	

Mn = Momentos nominales de la viga en cada extremo restringido de la luz libre.
Vg = Cortante calculado para cargas gravitacionales mayoradas.
Vm = Cortante debido a flexion en curvatura inversa.
Vu = Vm + Vg

V_g	$V_m = M_{ai} + M_{ad} / l_n$															
	COMBDIS3	COMBDIS4	COMBDIS5	COMBDIS6	COMBDIS7	COMBDIS8	COMBDIS9	COMBDIS10	COMBDIS11	COMBDIS12	COMBDIS13	COMBDIS14	COMBDIS15	COMBDIS16	COMBDIS17	COMBDIS18
(kN)	(kN)															
40.24	8.954	3.341	10.743	9.231	11.437	12.341	17.088	17.565	25.486	26.396	31.034	37.500	45.494	54.499	66.376	74.075
18.48																
165.30	44.815	8.480	19.160	5.482	7.841	47.673	66.882	31.077	33.394	29.472	74.016	133.221	120.721	82.175	94.874	147.035
149.28																
1.59	8.053	2.108	4.440	9.441	13.752	11.831	13.387	9.984	18.613	28.602	31.973	31.044	32.092	39.082	60.113	75.334
18.25																
33.70	44.100	17.840	10.234	25.963	38.632	55.626	74.765	39.987	50.537	87.134	121.265	153.771	146.744	125.969	184.978	260.779
74.34																
37.67	26.274	6.052	6.300	26.573	37.684	17.347	40.752	21.980	43.664	76.144	73.089	69.364	85.662	91.833	149.406	188.586
25.54																
51.91	13.611	3.198	7.963	1.869	1.678	14.267	21.425	12.327	12.748	8.519	21.863	42.134	41.438	30.892	31.484	44.212
27.12																
313.41	91.779	35.791	17.766	9.299	24.873	101.994	150.493	64.439	42.945	68.730	169.580	290.069	259.156	146.850	177.286	333.793
307.55																
52.10	13.058	3.125	10.581	2.134	3.763	14.726	21.289	16.056	16.649	11.016	24.977	43.416	45.037	38.830	39.440	50.846
26.10																
309.04	89.072	30.979	22.533	9.168	23.480	97.750	143.484	63.351	47.942	65.769	162.032	278.048	250.529	149.332	177.843	319.445
302.00																
48.25	8.933	6.758	14.481	1.870	3.095	11.314	20.861	23.261	20.690	9.244	21.214	40.987	53.508	52.072	41.519	44.983
18.60																
247.82	66.093	11.070	32.955	11.370	17.932	71.122	98.463	46.961	59.643	53.946	117.853	198.889	184.967	139.442	164.967	239.117
227.41																
96.74	72.406	20.699	23.076	75.519	102.548	72.745	117.749	71.534	130.849	217.187	226.739	229.663	256.389	280.069	439.903	555.492
80.25																
8.54	13.686	4.989	1.845	4.663	7.145	13.389	22.133	9.345	9.358	17.191	27.504	40.900	39.129	26.226	37.260	59.831
25.20																
87.95	96.006	42.941	1.739	22.745	15.488	101.373	160.050	59.355	35.032	75.980	189.483	297.224	264.265	133.775	173.275	334.327
151.42																
7.65	12.948	5.707	6.376	17.511	24.076	16.373	23.830	18.722	31.605	50.317	51.807	49.744	57.695	68.706	103.072	127.088
24.31																
80.65	69.875	39.523	8.093	15.760	34.084	100.031	150.223	61.296	39.715	85.240	176.401	286.529	256.071	144.105	191.645	361.433
144.12																
93.70	69.815	27.990	26.281	72.351	102.482	66.418	122.432	82.779	132.422	216.669	242.122	253.357	273.570	296.048	448.271	576.664
77.21																
68.26	47.723	7.159	27.752	23.982	26.742	52.862	72.192	43.455	66.752	72.080	103.893	149.733	149.725	141.842	185.252	233.645
51.78																
4.85	10.476	2.834	13.687	41.493	53.223	16.485	21.214	29.858	70.844	108.092	87.057	52.353	78.263	136.498	215.942	233.619
21.51																
77.28	86.143	20.644	19.772	35.961	50.488	89.734	139.806	66.702	76.889	122.902	186.835	267.436	259.749	196.632	274.295	410.064
138.89																
96.01	17.083	6.482	4.684	3.054	4.687	16.856	28.226	13.454	10.974	14.424	31.850	54.575	50.726	32.434	38.264	64.468
79.04																
2.84	26.167	11.369	7.420	19.627	24.170	31.683	45.726	27.035	36.013	57.811	72.650	92.154	93.763	86.145	123.315	168.753
55.60																
14.44	14.851	6.429	30.008	99.059	123.804	28.920	37.522	67.989	164.509	251.603	190.356	98.302	166.347	314.698	497.869	525.215
2.63																
108.33	20.192	9.200	3.581	14.847	19.946	22.178	35.217	19.251	25.056	46.038	55.222	67.778	70.081	61.847	91.895	129.002
89.06																
7.56	30.731	14.313	5.243	11.050	16.604	31.116	53.093	25.982	23.106	40.317	64.571	97.747	97.515	67.548	88.910	141.175
60.36																

Vu = Vm + Vg																	Vu_{max}	S	ΦVs	ΦVc	ΦVn	ΦVn > Vu_{max}
COMBDIS3	COMBDIS4	COMBDIS5	COMBDIS6	COMBDIS7	COMBDIS8	COMBDIS9	COMBDIS10	COMBDIS11	COMBDIS12	COMBDIS13	COMBDIS14	COMBDIS15	COMBDIS16	COMBDIS17	COMBDIS18						
(kN)																	(kN)	(m)	(kN)	(kN)	(kN)	
49.294	12.295	14.083	19.973	20.668	23.778	29.429	34.653	43.052	51.882	57.430	68.534	82.994	99.994	120.875	140.452						
18.464	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	140.5	0.10	178.92	68.90	247.82	OK
210.115	53.295	27.640	24.642	13.323	55.514	114.554	97.959	64.472	62.866	103.488	207.238	253.942	202.892	177.045	241.910						
149.280	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	253.9	0.10	178.92	68.90	247.82	OK
9.645	10.161	6.548	13.881	23.192	25.582	25.218	23.372	28.597	47.215	60.575	63.017	63.136	71.174	99.194	135.447						
18.252	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	135.4	0.10	178.92	114.84	293.76	OK
77.800	61.940	28.074	36.197	64.596	94.258	130.390	114.752	90.525	137.671	208.398	275.035	300.515	272.714	310.947	454.757						
74.340	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	454.8	0.10	178.92	114.84	293.76	OK
63.946	32.326	12.352	32.873	64.257	55.031	58.099	62.732	65.644	119.807	149.233	142.453	155.026	177.495	241.239	334.993						
26.540	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	335.0	0.10	178.92	114.84	293.76	OK
65.523	16.808	11.161	9.832	3.546	15.945	35.691	33.752	25.075	21.267	30.382	63.997	83.572	72.329	62.376	75.696						
27.124	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	83.6	0.10	178.92	68.90	247.82	OK
405.187	127.570	53.556	27.065	34.172	126.867	252.487	214.932	107.384	111.674	238.310	459.649	549.225	406.007	324.136	511.079						
307.548	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	549.2	0.10	178.92	68.90	247.82	OK
65.162	16.183	13.706	12.715	5.897	18.490	36.015	36.348	31.705	27.665	35.993	68.393	88.453	83.867	78.270	90.286						
26.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	90.3	0.10	178.92	68.90	247.82	OK
398.108	120.051	53.512	31.701	32.648	121.230	241.233	206.794	111.253	113.711	227.801	440.080	528.578	399.862	327.175	497.289						
301.996	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	528.6	0.10	178.92	68.90	247.82	OK
54.185	15.731	21.280	16.352	4.965	14.409	32.175	44.122	43.951	29.934	30.489	62.201	94.495	108.580	93.591	86.502						
18.604	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	105.6	0.10	178.92	68.90	247.82	OK
313.909	77.163	44.025	44.326	29.303	89.068	169.585	148.424	109.605	113.589	171.799	316.741	383.856	324.409	304.409	404.084						
227.408	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	404.1	0.10	178.92	68.90	247.82	OK
169.142	93.105	43.775	98.596	178.068	175.294	190.494	189.283	202.383	348.036	443.926	456.402	486.052	536.489	719.973	995.395						
80.248	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	995.4	0.10	178.92	114.84	293.76	OK
22.222	18.674	6.834	6.509	11.808	20.534	35.522	31.477	18.703	26.549	44.695	68.404	80.029	65.355	63.485	97.091						
25.196	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	97.1	0.10	178.92	114.84	293.76	OK
183.958	138.946	44.680	24.484	38.234	116.862	261.424	219.405	94.387	111.013	235.464	456.707	561.489	398.040	307.049	507.602						
151.424	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	561.5	0.10	178.92	114.84	293.76	OK
20.596	18.656	12.084	23.888	41.587	40.449	40.202	42.552	50.327	81.922	102.124	101.552	107.440	126.402	171.778	230.160						
24.308	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	230.2	0.10	178.92	114.84	293.76	OK
170.527	129.399	47.617	23.853	49.844	134.115	250.254	211.519	101.011	124.955	263.641	464.930	542.600	400.177	335.750	553.078						
144.124	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	553.1	0.10	178.92	114.84	293.76	OK
163.511	97.806	54.271	98.631	174.833	188.900	208.850	205.212	215.202	349.091	458.791	495.479	526.927	569.618	742.319	1022.935						
77.208	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1022.9	0.10	178.92	114.84	293.76	OK
115.983	54.882	34.911	51.734	50.724	79.604	125.054	115.647	110.207	138.832	175.973	253.626	299.458	291.566	327.093	418.897						
51.784	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	418.9	0.10	178.92	114.84	293.76	OK
15.328	13.311	16.522	55.181	94.716	69.708	37.698	51.071	100.702	178.937	195.149	139.410	130.617	214.761	352.439	449.561						
21.512	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	449.6	0.10	178.92	114.84	293.76	OK
163.427	115.786	49.416	55.733	86.449	140.222	229.541	206.508	143.591	199.791	308.737	453.271	527.185	456.381	470.926	684.359						
138.888	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	684.4	0.10	178.92	114.84	293.76	OK
113.091	23.565	11.167	7.738	7.741	23.543	47.083	41.681	24.428	25.398	46.074	86.226	108.301	83.160	70.499	102.732						
79.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	113.1	0.10	178.92	45.93	224.85	OK
29.011	37.536	18.788	27.046	43.796	55.852	77.409	72.761	63.048	93.824	130.461	164.804	185.917	179.909	209.460	292.068						
55.596	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	292.1	0.10	178.92	45.93	224.85	OK
29.287	21.280	36.437	129.067	222.863	152.724	66.442	105.511	232.498	416.112	441.959	288.658	264.649	481.045	812.567	1023.084						
2.628	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1023.1	0.10	178.92	45.93	224.85	OK
128.524	29.392	12.782	18.429	34.793	42.123	57.394	54.467	44.306	70.094	100.260	123.000	137.859	131.928	153.742	220.897						
89.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	220.9	0.10	178.92	45.93	224.85	OK
38.295	45.045	19.557	16.293	27.653	47.720	84.209	79.074	49.088	63.423	104.889	162.318	195.262	165.064	156.458	230.084						
60.360	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	230.1	0.10	178.92	45.93	224.85	OK
24.983	28.047	33.792	144.179	294.104	195.910	68.914	119.096	263.147	515.249	572.089	348.015	294.619	558.701	981.357	1287.365						
2.168	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1287.4	0.10	178.92	45.93	224.85	OK
124.489	26.653	12.343	8.320	9.582	27.657	53.341	46.814	27.104	29.268	54.130	98.740	118.798	93.394	80.405	119.114						
84.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	124.5	0.10	178.92	45.93	224.85	OK
26.589	17.908	13.552	17.905	10.778	19.511	39.863	39.739	37.863	39.257	43.952	74.631	98.606	97.204	99.436	114.219						
0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	114.2	0.10	178.92	45.93	224.85	OK
40.438	46.126	18.909	9.368	12.473	43.240	89.331	77.174	37.713	39.279	83.204	160.884	195.371	144.598	113.750	179.116						
61.320	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	195.4	0.10	178.92	45.93	224.85	OK

NIVEL	VIGA	LOC.	LONG.	PROPIEDADES DEL ELEMENTO			M3						Mn (kN.m)															
													Combinaciones para resistencias nominales a momento															
	ELEMENTO No.	(m)	(m)	SECCION	b (m)	d (m)	C.M. (KN.m)	C.V. (KN.m)	SISMO X (KN.m)	SISMO Y (KN.m)	-SISMO X (KN.m)	-SISMO Y (KN.m)	COMBDIS3	COMBDIS4	COMBDIS5	COMBDIS6	COMBDIS7	COMBDIS8	COMBDIS9	COMBDIS10	COMBDIS11	COMBDIS12	COMBDIS13	COMBDIS14	COMBDIS15	COMBDIS16	COMBDIS17	COMBDIS18
PISO1	B182	0.000	9.500	VIGA20X45	0.20	0.40	-54.344	-53.230	14.900	3.381	4.975	1.601	114.906	47.893	22.473	17.048	36.299	128.969	191.911	86.153	60.681	98.210	220.917	369.864	336.479	200.617	244.778	442.394
	B182	9.500					-29.105	-30.817	13.167	4.493	1.224	0.083	62.517	22.733	20.575	10.802	16.960	69.040	103.046	51.382	43.859	52.134	115.717	200.236	188.259	124.817	143.829	235.326
PISO1	B183	0.000	1.200	VIGA20X45	0.20	0.40	-4.360	-3.697	2.949	4.677	4.136	0.290	7.962	0.172	9.154	10.344	7.034	8.958	12.450	12.129	23.489	22.267	20.975	27.462	33.773	44.390	56.946	56.049
	B183	1.200					-3.389	-3.401	0.983	0.703	-1.224	-0.083	7.202	3.024	1.805	0.581	0.250	7.882	12.029	5.266	2.588	2.901	11.306	22.830	20.471	10.302	10.020	21.126
PISO1	B184	0.000	2.750	VIGA20X45	0.20	0.40	-3.497	-3.195	0.199	1.209	-4.136	-0.290	7.275	3.682	0.461	2.288	3.291	7.776	12.666	5.609	4.090	8.681	15.034	23.517	22.296	13.753	18.498	32.164
	B184	2.750					-26.485	-33.181	5.294	4.008	8.232	0.711	75.519	33.210	11.815	16.334	27.306	84.540	127.548	57.118	42.217	74.197	149.459	244.504	224.504	137.210	174.370	307.796
PISO1	B185	0.000	9.500	VIGA20X45	0.20	0.40	-57.664	-56.817	20.352	6.101	12.465	1.282	119.981	43.996	35.383	30.488	45.853	133.625	197.833	98.010	92.046	126.322	239.145	386.099	364.219	263.450	314.860	499.612
	B185	9.500					-30.903	-32.348	19.392	5.203	1.592	0.307	64.775	18.137	28.937	12.623	18.301	71.103	103.139	54.725	56.153	56.124	119.833	204.368	194.712	142.271	163.718	248.378
PISO1	B186	0.000	2.750	VIGA20X45	0.20	0.40	-2.986	-2.589	0.070	1.544	-8.404	-0.866	6.034	3.230	0.297	6.341	9.395	5.732	10.989	6.209	9.158	19.009	19.855	19.829	22.664	22.166	35.744	48.583
	B186	2.750					-38.809	-35.457	7.700	7.304	-1.992	-0.307	79.830	33.358	16.061	12.027	17.266	87.946	133.529	59.534	41.024	60.144	142.335	255.118	233.295	138.799	158.010	286.753
PISO1	B187	0.000	1.200	VIGA20X45	0.20	0.40	-6.523	-6.026	5.967	5.867	15.016	7.669	12.136	1.041	16.876	24.570	28.455	22.696	20.993	25.481	52.657	64.381	63.205	57.400	66.666	101.755	148.441	157.662
	B187	1.200					-3.132	-3.025	0.981	0.876	2.825	0.946	6.507	2.266	2.744	4.520	5.933	8.329	10.986	6.863	9.687	13.941	18.347	23.151	23.128	22.244	35.185	41.762
PISO1	B188	0.000	9.500	VIGA20X45	0.20	0.40	-55.338	-53.551	21.045	2.589	-15.016	-7.669	115.107	43.642	23.995	5.940	2.801	117.202	187.499	77.872	43.169	48.473	167.421	348.325	315.695	158.549	160.703	324.041
	B188	9.500					-28.458	-30.767	18.774	5.076	-2.496	-0.526	60.340	18.963	28.015	8.701	11.018	65.345	96.176	51.038	49.124	42.352	103.342	189.207	180.192	126.680	136.920	208.272
PISO1	B189	0.000	2.750	VIGA20X45	0.20	0.40	-3.996	-3.481	0.142	0.819	-2.156	-0.408	8.112	3.961	0.483	0.723	0.928	8.535	13.851	5.459	2.078	4.616	13.091	25.444	22.849	10.527	15.715	25.808
	B189	2.750					-35.180	-31.844	7.399	3.295	0.117	1.159	72.196	30.074	12.277	9.142	19.348	81.088	120.047	51.667	33.580	56.341	134.429	231.078	206.961	117.066	141.914	267.186
PISO1	B190	0.000	1.200	VIGA20X45	0.20	0.40	-4.832	-3.901	4.440	4.057	10.335	7.483	8.202	1.340	12.179	17.408	21.768	18.258	15.089	19.117	38.075	47.717	49.000	43.755	48.830	74.888	107.213	119.238
	B190	1.200					-3.132	-3.296	1.270	0.380	-0.117	-1.159	6.747	2.609	1.801	0.531	0.374	6.056	11.140	5.074	3.179	3.100	9.318	19.747	19.355	10.578	10.302	18.716
PISO1	B191	0.000	9.500	VIGA20X45	0.20	0.40	-59.120	-31.748	29.618	9.411	-10.335	-7.483	71.483	7.077	62.159	4.067	3.498	66.923	102.407	51.789	59.897	30.084	97.350	198.305	190.101	138.219	136.814	190.192
	B191	9.500					-15.552	-10.540	28.252	3.482	9.022	1.939	22.692	16.846	39.074	13.144	16.531	31.367	53.636	63.312	65.758	42.850	67.345	109.732	148.154	155.784	144.089	152.827
PISO1	B192	0.000	1.200	VIGA20X45	0.20	0.40	-2.936	-1.848	8.265	3.557	7.476	2.645	3.298	7.329	15.263	12.492	12.838	9.118	15.511	27.689	34.268	30.888	29.816	34.890	55.976	76.346	80.961	78.367
	B192	1.200					-1.914	-1.169	1.243	0.625	-13.560	-4.618	3.148	0.925	1.205	13.626	20.129	2.108	5.879	6.684	19.685	37.341	28.014	11.206	20.603	37.872	67.936	76.687
PISO1	B193	0.000	2.750	VIGA20X45	0.20	0.40	0.303	0.049	1.227	1.009	-6.195	-4.379	0.753	1.164	1.035	4.907	10.368	4.175	2.624	4.213	8.732	17.389	17.480	9.152	10.459	18.810	32.332	41.040
	B193	2.750					-35.071	-27.873	9.221	4.031	-0.244	-2.334	67.640	23.347	14.886	8.584	13.961	71.020	108.396	45.741	34.285	47.270	114.911	206.070	186.586	107.339	127.665	229.867
PISO1	B194	0.000	2.750	VIGA20X45	0.20	0.40	-2.092	-1.338	0.855	0.194	-7.022	-1.939	3.645	1.176	0.470	6.377	9.477	1.611	6.120	6.063	9.754	18.615	14.614	9.626	14.815	19.740	34.208	40.075
	B194	2.750					-10.016	-8.062	1.280	2.196	-12.687	-7.601	19.651	8.754	0.396	10.443	17.875	12.502	33.120	14.414	15.724	35.350	42.272	52.373	60.011	43.703	67.146	100.382
PISO1	B197	0.000	1.900	VIGA20X45	0.20	0.40	-1.155	-0.761	0.600	0.107	0.195	1.299	2.007	0.278	0.957	0.746	1.397	3.691	2.947	1.588	2.584	3.909	6.848	7.900	5.958	5.814	9.058	13.692
	B197	1.900					-13.680	-8.524	0.413	1.631	4.725	5.325	24.739	9.138	3.532	9.555	17.102	33.396	40.245	17.752	19.780	38.624	64.048	85.583	73.016	53.935	82.297	134.280
PISO1	B198	0.000	1.950	VIGA20X45	0.20	0.40	-15.105	-9.448	1.043	1.897	-0.195	-1.299	27.216	9.886	3.019	3.607	5.174	28.055	43.456	16.028	10.250	18.634	44.989	81.368	71.696	36.624	46.356	90.212
	B198	1.950					-34.367	-23.423	6.700	7.055	-4.725	-5.325	62.704	20.155	13.690	6.738	4.283	61.706	98.891	39.659	28.231	32.674	91.465	163.633	166.780	89.180	99.119	162.599
PISO1	B199	0.000	3.260	VIGA20X45	0.20	0.40	-28.517	-19.345	9.526	19.462	3.365	5.742	50.151	9.139	32.024	31.329	21.534	61.207	78.526	51.390	78.633	77.977	107.924	168.437	168.293	164.824	207.562	250.191
	B199	3.260					6.201	7.177	2.349	7.758	0.802	0.631	15.657	12.739	10.797	11.298	5.922	19.965	34.680	28.989	26.899	26.226	36.711	66.874	78.331	69.961	75.121	88.265
PISO1	B200	0.000	2.620	VIGA20X45	0.20	0.40	8.701	9.437	1.860	7.132	-3.365	-5.742	20.767	14.545	8.233	5.302	4.195	17.658	41.648	27.145	17.291	17.258	33.757	70.023	82.117	55.951	50.178	75.502
	B200	2.620					5.837	4.848	3.312	5.676	-0.802	-0.631	12.967	10.238	9.432	6.736	1.977	19.136	28.443	23.466	19.503	15.320	25.394	53.121	62.594	52.760	47.908	59.780
PISO1	B201	0.000	2.620	VIGA20X45	0.20	0.40	2.954	2.174	3.412	6.139	13.098	6.418	6.886	8.258	13.572	22.350	24.256	17.328	21.028	30.063	45.173	56.289	53.065	51.513	69.087	97.256	125.723	136.665
	B201	2.620					-20.556	-18.275	3.470	10.524	4.363	2.054	41.469	15.830	15.794	20.213	17.560	48.505	70.481	40.453	46.302	57.292	87.930	140.734	139.104	113.440	141.777	197.228
PISO1	B202	0.000	3.260	VIGA20X45	0.20	0.40	-23.857	-20.310	6.231	8.858	0.130	1.983	46.963	18.163	16.501	14.381	13.677	54.035	77.142	39.997	40.794	48.049	90.256	153.691	144.836	108.484	127.297	191.701
	B202	3.260					6.725	5.091	2.108	3.967	7.236	3.340	13.894	9.581	8.327	13.665	15.749	20.586	29.015	23.911	28.530	38.656	47.528	60.934	67.647	68.982	87.516	111.966
PISO1	B203	0.000	2.620	VIGA20X45	0.20	0.40	9.006	7.209	1.712	3.455	11.755	4.458	18.627	11.914	8.419	18.133	23.498	27.185	37.346	28.312	35.270	53.789	65.569	78.612	84.551	85.569	115.923	153.222
	B203	2.620					4.498	3.234	2.655	5.438	-4.850	-2.703	9.584	7.421	7.366	1.714	5.898	8.481	20.673	17.045	12.429	11.218	21.289	35.466	46.363	36.796	33.228	48.656
PISO1	B204	0.000	2.620	VIGA20X45	0.20	0.40	1.510	0.483	2.573	5.743	-4.363	-2.054	3.220	4.102	7.724	2.287	6.301	2.181	9.834	13.575	13.101	10.185	12.833	16.342	28.966	32.510	29.848	30.617
	B204	2.620					-23.138	-19.465	3.495	8.344	-6.785	-2.606	45.898	18.461	10.856	5.709	0.662	47.597	76.331	34.324	22.061	23.198	67.666	142.546	132.371	72.916	74.211	136.006
PISO1	B205	0.000	3.260	VIGA20X45	0.20	0.40	-28.497	-24.150	4.886	11.040	-7.236	-3.340	56.525	22.123	15.073	9.038	2.013	58.408	93.905	43.763	31.468	32.105	84.638	175.853	165.582	96.761	100.399	173.281
	B205	3.260					10.814	9.191	2.117	3.723	0.174	1.253	22.888	13.985	6.386	6.446	7.480	27.924	43.298	25.099	17.632	24.307	48.195	93.559	82.935	56.365	61.746	101.438
PISO1	B206	0.000	2.620	VIGA20X45	0.20	0.40	13.325	11.423	1.947	3.048	2.425	2.233	28.049	18.494	6.072	8.449	12.476	34.799	52.065	28.576	20.828	33.816	63.244	101.581	97.934	66.847	79.636	132.924
	B206	2.620					17.982	15.697	2.739	9.453	-0.174	-1.253	36.514	23.664	12.618	13.489	8.675	43.111	73.583	44.584	33.402	39.311	72.844	137.460	142.927	100.495	104.764	160.090
PISO1	B207	0.000	2.620	VIGA20X45	0.20	0.40	15.837	13.608	2.591	9.859	-2.425	-2.233	33.845	20.950	12.280	11.166	3.775	36.640	65.038	40.153	29.184	29.882	58.300	119.874	126.661	87.844	85.620	128.965
	B207	2.620					-5.009	-3.408	5.166	14.598	2.765	4.721	7.184	6.949	23.727	24.212	9.371	15.523	20.433	35.711	55.935	43.827	24.410	50.726	75.583	110.823	121.987	103.325
PISO1	B210	0.000	1.950	VIGA20X45	0.50	0.40	4.176	3.648	1.757	0.481	1.796	2.038	9.079	6.358	3.124	3.431	6.835	13.145	18.175	11.958	9.531	14.888	25.943	37.242	36.879	28.919	34.571	54.540
	B210	1.950					-49.928	-31.753	18.330	11.052	-2.765	-4.731	86.908	17.550	32.118	15.240	12.433	87.269	129.989	57.394	62.362	58.760	134.901	251.623	231.157	153.290	180.368	276.784
PISO1	B211	0.000	3.260	VIGA20X45	0.50	0.40	-109.345	-85.132	11.972	79.034	-1.796	-2.038	208.657	72.743	92.865	106.502	47.024	228.567	350.868	206.959	243.629	249.011	376.764	687.381	698.741	572.433	670.916	874.912
	B211	3.260					68.595	59.551	10.805	16.766	14.512	4.808	145.384	86.959	33.277	45.362	60.327	172.696	271.841	151.738	110.244	171.297	315.614	520.196	513.866	261.436	408.403	671.016
PISO1	B212	0.000	2.620	VIGA20X45	0.50	0.40	66.128	57.511	9.816	17.979	5.294	3.246	140.245	83.184	31.173	37.040	46.430	164.703	260.874	142.321	95.746	144.870	287.879	496.528	486.305	317.916	398.840	604.483
	B212	2.620					48.319	40.794	2.952	17.973	0.276	2.076	100.626	55.917	21.715	29.013	28.496	116.991	183.428	97.163	69.203	101.539	198.426	350.023	339.425	221.592	252.013	420.684
PISO1	B213	0.000	2.620	VIGA20X45	0.50	0.40	51.516	43.509	3.424	16.905	7.439	1.984	107.216	59.887	22.799	35.314	38.729	124.425	195.967	105.093	79.574	121.820	221.455	371.937	366.059	247.521	291.450	475.140
	B213	2.620					-123.083	-103.762	28.488	75.271	13.774	5.267	240.140	78.438	112.830	121.283	80.410	271.437	393.765	239.269	292.644	312.930	472.717	796.175	804.881	680.819	822.353	1070.281
PISO1	B214	0.000	3.260	VIGA20X45	0.50	0.40	-128.034	-104.064	12.436	64.548	-14.512	-4.808	250.638	99.064	75.326	78.586	60.079	271.944	421.941	214.938	196.733	222.944	428.134	809.154	779.850	532.745	608.109	927.469
	B214	3.260					57.687	48.573	6.777	8.473	-4.974	-2.413	119.868	66.818	15.339	12.649	22.697	132.799	214.710	99.602	44.953	81.700	214.388	399.199	372.690	196.923	209.898	425.985

V_e (kN)	$V_u = M_{ul} + M_{ur} / l_n$ (kN)															
	COMBDIS3	COMBDIS4	COMBDIS5	COMBDIS6	COMBDIS7	COMBDIS8	COMBDIS9	COMBDIS10	COMBDIS11	COMBDIS12	COMBDIS13	COMBDIS14	COMBDIS15	COMBDIS16	COMBDIS17	COMBDIS18
105.20 / 84.71	18.676	7.434	4.531	2.932	5.606	20.843	31.048	14.477	11.004	15.826	35.435	60.011	55.236	34.256	40.906	71.444
7.28 / 4.53	12.637	2.663	8.966	8.687	6.070	14.034	20.399	14.497	21.731	20.974	26.818	41.910	45.204	45.577	55.805	64.313
5.44 / 58.24	30.107	13.415	4.464	6.763	11.162	33.570	50.987	22.810	16.839	30.137	59.816	97.462	89.745	54.896	70.134	123.622
106.84 / 85.88	19.445	6.540	6.771	4.538	6.753	21.550	31.681	16.077	15.600	19.100	37.766	62.154	58.835	41.655	50.356	78.420
8.40 / 61.14	31.223	13.305	5.056	6.679	9.695	34.068	52.541	24.052	18.252	28.783	58.978	99.981	93.076	57.442	70.456	121.940
13.30 / 1.48	15.536	2.756	16.350	24.242	28.656	25.854	26.648	26.954	51.953	65.268	67.960	67.126	74.828	103.332	147.189	166.187
105.02 / 84.42	18.468	6.379	5.475	1.541	1.455	19.216	29.860	13.569	9.715	9.565	28.501	56.582	52.199	30.024	31.329	56.033
3.75 / 56.54	29.203	12.376	4.640	3.587	7.373	32.590	48.690	20.780	12.966	22.166	53.644	93.281	83.568	46.405	55.865	106.543
8.20 / 3.60	12.458	3.298	11.649	14.948	18.451	20.261	21.833	20.159	34.378	42.347	48.598	52.918	56.821	71.220	97.928	114.962
54.44 / 39.76	9.913	2.518	8.551	1.812	2.108	10.346	16.435	12.116	13.231	7.677	17.336	32.425	35.290	30.632	29.569	36.107
5.65 / 1.82	5.371	6.678	13.723	21.765	27.472	9.355	17.824	28.645	44.961	56.858	48.192	38.413	63.815	95.182	124.081	129.211
7.32 / 56.06	24.870	8.913	5.790	4.906	8.847	27.344	40.371	18.165	15.642	23.502	48.142	78.263	71.653	45.673	58.188	98.513
6.53 / 21.28	8.471	3.611	0.315	6.335	9.946	5.132	14.269	6.719	9.265	19.639	20.686	22.538	27.209	23.070	36.856	51.076
6.53 / 22.36	14.077	4.955	2.362	5.400	10.052	19.519	22.732	10.179	11.770	22.386	37.312	49.202	41.566	31.447	48.082	77.880
15.04 / 31.58	46.113	15.406	8.569	5.305	4.850	46.031	72.999	28.557	19.734	26.312	69.977	135.898	122.295	64.515	74.602	139.903
45.70 / 5.91	20.187	6.711	13.135	13.078	8.422	24.900	34.726	24.656	32.372	31.964	44.367	72.242	75.852	72.020	85.486	103.821
9.88 / 17.88	12.876	9.497	6.743	4.595	2.356	12.517	26.753	19.317	14.044	12.434	22.577	47.002	55.370	41.493	37.437	51.634
9.48 / 37.04	18.456	9.194	11.209	16.245	15.945	25.127	34.916	26.915	34.914	43.351	53.815	73.377	79.462	80.433	102.099	127.440
43.62 / 3.82	18.668	7.897	7.616	8.594	9.026	22.890	32.564	19.604	21.265	26.597	42.265	65.805	65.179	53.517	65.894	93.149
9.27 / 18.28	10.768	7.380	6.025	7.575	11.220	13.613	22.145	17.312	18.206	24.812	33.152	43.541	49.586	46.704	56.929	75.908
9.68 / 37.22	18.747	8.612	7.092	3.052	2.665	18.999	32.888	18.282	13.421	12.742	30.725	60.644	61.579	40.239	39.717	63.597
50.74 / 10.94	24.359	11.076	6.582	4.750	2.912	26.491	42.087	21.123	15.062	17.304	40.746	79.574	76.128	46.971	49.738	84.270
18.51 / 9.03	25.406	15.328	7.133	8.362	8.073	29.736	47.957	27.923	20.698	27.912	51.942	91.226	91.932	63.871	70.374	111.837
6.16 / 33.70	15.653	9.885	13.743	13.503	5.247	19.910	32.622	28.956	32.488	28.049	35.385	65.114	77.192	75.827	79.239	88.660
45.41 / 79.32	49.222	12.260	18.073	9.575	9.778	51.494	75.982	35.565	36.869	37.777	82.484	148.136	137.455	93.440	110.225	169.899
172.70 / 100.48	108.601	48.988	38.694	46.593	32.930	123.087	191.015	110.030	108.550	128.929	212.386	370.407	371.965	283.395	331.079	474.211
7.82 / 44.55	91.935	53.092	20.186	25.211	28.598	107.517	169.581	91.406	62.958	94.049	185.613	323.111	315.164	205.919	232.386	391.285
143.74 / 196.10	132.579	52.796	51.767	59.770	45.473	151.093	227.379	131.436	142.068	165.931	264.951	447.389	446.924	354.328	425.116	593.279
179.39 / 107.18	113.652	50.822	27.995	27.986	19.296	124.154	195.292	96.485	74.137	93.449	197.093	370.661	353.540	223.825	250.922	415.170

$Vu = Vm + Vg$																	Vu_{max}	S	ΦVs	ΦVc	ΦVn	ΦVn > Vu_{max}
COMBDIS3	COMBDIS4	COMBDIS5	COMBDIS6	COMBDIS7	COMBDIS8	COMBDIS9	COMBDIS10	COMBDIS11	COMBDIS12	COMBDIS13	COMBDIS14	COMBDIS15	COMBDIS16	COMBDIS17	COMBDIS18							
(kN)																	(kN)	(m)	(kN)	(kN)	(kN)	
123.880	26.111	11.965	7.463	8.538	26.449	51.891	65.526	25.482	26.830	51.261	95.446	115.246	89.492	75.162	112.350							
84.712	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
19.913	15.300	11.629	17.654	14.758	20.104	34.433	34.896	36.229	42.705	47.791	68.727	87.114	90.760	101.381	120.118							
4.532	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
35.551	43.523	17.880	11.227	17.926	44.732	84.557	73.797	39.649	46.976	89.953	157.278	187.208	144.641	125.029	193.755							
58.240	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
126.289	25.985	13.311	11.308	11.291	28.303	53.232	47.759	31.677	34.699	56.866	99.921	120.989	100.490	92.010	128.776							
85.884	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
39.627	44.528	19.260	12.635	16.374	43.760	86.606	76.593	42.304	47.034	87.761	158.959	193.057	150.518	127.898	192.397							
61.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
28.836	18.292	19.105	40.591	52.898	54.510	52.502	53.602	78.907	117.221	133.228	135.086	141.954	178.160	250.521	313.376							
1.480	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
123.484	24.848	11.854	7.016	2.996	20.670	49.076	43.430	23.285	19.280	38.066	85.084	108.781	82.223	61.353	87.362							
84.432	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
32.951	41.579	17.016	8.227	10.960	39.964	81.280	69.470	33.747	35.133	75.810	146.924	176.848	129.972	102.270	162.408							
56.544	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
20.662	15.756	14.948	26.597	33.399	38.712	42.094	41.992	54.538	76.725	90.945	101.516	109.739	128.041	169.148	212.891							
3.604	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
64.357	12.431	11.069	10.363	3.920	12.455	26.781	28.551	25.347	20.908	25.014	49.761	67.715	65.922	60.201	65.676							
39.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
11.019	12.249	20.601	35.488	49.237	36.827	27.179	46.469	73.606	101.819	105.049	86.604	102.228	158.998	219.263	253.292							
1.816	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
32.186	33.783	14.703	10.495	13.753	36.191	67.714	58.536	33.807	39.144	71.644	126.405	149.916	117.526	104.061	156.701							
56.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
14.999	12.082	3.926	6.649	16.281	15.078	19.401	20.988	15.983	28.904	40.325	43.224	49.747	50.280	59.927	87.932							
21.276	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
20.605	19.032	7.318	7.763	15.453	29.571	42.251	32.911	21.949	34.156	59.698	86.514	90.768	73.013	79.529	125.961							
22.360	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
61.157	61.518	23.974	13.874	10.155	50.881	119.030	101.556	48.291	46.046	96.288	205.874	258.193	186.810	139.117	214.506							
31.584	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
65.887	26.898	19.846	26.213	21.500	33.322	59.625	59.362	57.028	64.336	76.331	116.609	147.894	147.672	157.506	189.306							
5.908	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
22.532	22.373	16.240	11.337	6.951	14.873	39.269	46.070	33.361	26.478	35.011	69.578	102.372	96.863	78.930	89.071							
17.884	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
27.936	27.651	20.403	27.454	32.191	41.072	60.043	61.830	61.829	78.266	97.166	127.192	152.839	159.895	182.532	229.539							
37.098	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
62.284	26.565	15.513	16.210	17.620	31.916	55.453	52.167	40.869	47.862	68.861	108.070	130.984	118.696	119.411	159.043							
3.824	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
20.036	18.147	13.405	13.600	18.795	24.833	35.758	39.457	35.518	43.018	57.964	76.693	93.127	96.290	103.633	132.836							
18.260	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
28.423	27.359	15.704	10.143	5.717	21.664	51.887	51.170	31.703	26.163	43.466	91.369	122.223	101.818	79.956	103.314							
37.216	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
75.095	35.435	17.658	11.332	7.662	29.403	68.578	63.210	36.185	32.366	58.050	120.320	155.702	123.099	96.709	134.007							
10.944	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
43.914	40.733	22.461	15.495	16.434	37.809	77.693	75.880	48.621	48.610	79.854	143.168	183.157	155.803	134.245	182.211							
9.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
21.813	25.538	23.628	27.246	18.749	25.156	52.532	61.578	61.444	60.537	63.434	100.500	142.307	153.020	155.066	167.899							
33.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
94.630	61.483	30.333	27.648	19.353	61.273	127.476	111.547	72.434	74.645	120.261	230.621	285.591	230.895	203.665	280.124							
79.324	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
281.301	157.590	87.683	85.287	79.523	156.017	314.102	301.045	218.580	237.479	341.315	582.793	742.372	655.361	614.475	805.291							
100.480	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
99.751	145.028	73.279	45.398	53.809	136.115	277.098	260.987	154.364	157.007	279.662	508.724	638.275	521.083	438.305	623.672							
44.582	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
276.315	185.375	104.563	111.537	105.243	196.565	378.472	358.815	273.504	307.999	430.882	712.320	894.293	801.252	779.444	1018.394							
196.104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
293.040	164.474	78.818	55.982	47.243	143.411	319.446	291.777	170.622	167.586	290.542	567.753	724.200	577.364	474.747	666.092							
107.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							

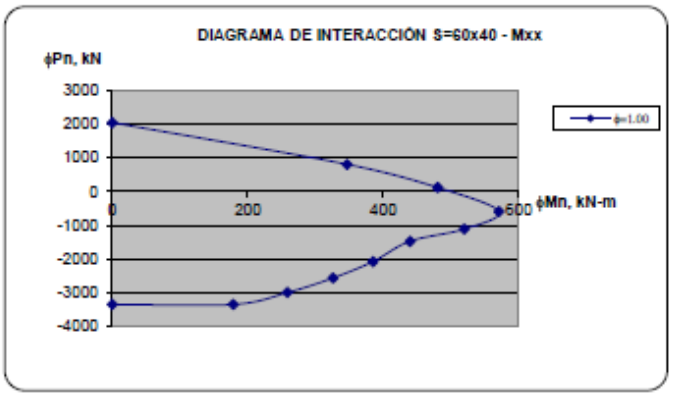
NIVEL	VIGA (ELEMENTO) No.	LOC. (m)	LONG. (m)	PROPIEDADES DEL ELEMENTO: SECCION	b (m)	d (m)	V2: C.M. (KN.m)	C.V. (KN.m)	SISMO X (KN.m)	SISMO Y (KN.m)	-SISMO X (KN.m)	-SISMO Y (KN.m)	$2V_E$ Combinaciones de carga de diseño para el doble del cortante dado en lackups E: COMBDIS3	COMBDIS4	COMBDIS5	COMBDIS6	COMBDIS7	COMBDIS8	COMBDIS9	COMBDIS10	COMBDIS11	COMBDIS12	COMBDIS13	COMBDIS14	COMBDIS15	COMBDIS16	COMBDIS17	COMBDIS18	$2V_{Emax}$ (KN)	S (m)	ΦVs (KN)	ΦVc (KN)	ΦVn (KN)	$ΦVn > 2V_{Emax}$
PISO1	B199	0	3.26	VIG20X45	0.20	0.40	-18.59	-14.61	8.46	7.18	4.3	10.42	34.903	35.494	34.887	35.276	34.858	35.040	34.148	34.326	14.706	15.297	14.440	13.801	14.671	14.848	13.931	14.129	35.5	0.10	178.92	45.83	224.75	OK
	B199	3.26					-2.71	-1.06	8.46	7.18	4.3	10.42	2.087	3.479	2.671	3.352	2.852	3.030	2.132	2.350	0.414	1.005	0.188	0.789	0.379	0.557	0.341	0.563						
PISO1	B200	0	2.63	VIG20X45	0.20	0.40	-4.86	-3.54	3.06	9.78	-4.3	-10.42	7.022	8.430	8.308	9.701	5.821	6.245	10.310	10.734	2.084	4.498	4.431	5.944	1.883	2.307	6.372	6.798	16.6	0.10	178.92	45.83	224.75	OK
	B200	2.62					6.85	6.04	3.06	9.78	-4.3	-10.42	15.370	13.956	14.013	12.030	16.571	16.147	12.082	11.658	7.275	5.861	5.928	4.315	6.476	6.052	3.987	3.563						
PISO1	B201	0	2.63	VIG20X45	0.20	0.40	3.22	3.51	4.28	3.36	4.56	4.72	8.544	8.815	8.040	8.702	8.406	8.425	8.708	8.727	4.073	4.135	4.164	4.228	3.930	3.949	4.233	4.251	31.7	0.10	178.92	45.83	224.75	OK
	B201	2.62					14.73	12.1	4.28	3.36	7.6	1	30.451	31.689	30.794	31.532	30.808	31.029	30.284	30.505	14.421	15.170	14.275	15.013	14.289	14.310	13.765	12.986						
PISO1	B202	0	3.26	VIG20X45	0.20	0.40	-17.32	-14.27	4.81	3	7.6	1	33.760	33.165	33.918	33.298	34.056	33.881	34.310	34.325	14.317	13.899	14.450	13.833	14.600	14.415	15.044	14.859	34.5	0.10	178.92	45.83	224.75	OK
	B202	3.26					-1.44	-1.21	4.81	3	3.26	4.76	1.757	1.119	1.630	1.966	2.030	2.154	1.604	1.762	0.825	0.372	0.092	0.254	0.108	0.412	0.082	0.021						
PISO1	B203	0	2.63	VIG20X45	0.20	0.40	-4.83	-2.77	1.71	6.78	3.26	4.76	6.772	6.430	6.906	6.504	5.985	5.881	6.414	6.331	1.793	2.451	1.827	2.585	2.006	1.803	1.455	1.352	16.4	0.10	178.92	45.83	224.75	OK
	B203	2.62					7.47	5.81	1.71	6.78	-4.56	-4.72	15.808	14.212	14.842	13.446	16.395	15.977	13.840	13.421	7.532	6.162	6.791	5.395	6.744	7.816	5.789	5.370						
PISO1	B204	0	2.63	VIG20X45	0.20	0.40	3.65	3.31	3.76	2	-7.6	-1	9.659	6.134	8.459	5.934	8.385	7.628	7.718	6.981	4.254	1.739	4.054	1.529	3.980	3.213	3.312	2.556	31.1	0.10	178.92	45.83	224.75	OK
	B204	2.62					15.16	11.89	3.76	2	-7.6	-1	31.051	29.536	30.851	29.336	30.777	30.020	30.112	29.352	14.613	12.088	14.412	11.889	14.339	12.582	13.672	12.915						
PISO1	B205	0	3.26	VIG20X45	0.20	0.40	-20	-16.71	3.6	4.5	-3.26	-4.76	39.610	41.134	40.227	41.752	39.470	39.927	41.528	41.985	16.900	18.424	17.517	19.042	16.760	17.217	18.818	19.275	42.0	0.10	178.92	45.83	224.75	OK
	B205	3.26					-4.12	-3.75	3.6	4.5	3.28	5.06	7.594	7.665	7.557	7.628	7.454	7.475	7.330	7.351	2.608	2.679	2.571	2.642	2.468	2.489	2.344	2.365						
PISO1	B206	0	2.63	VIG20X45	0.20	0.40	-7.53	-5.92	3.31	9.54	3.28	5.06	13.884	13.591	14.303	13.990	11.681	12.017	12.677	13.012	5.625	5.412	5.924	5.711	4.502	4.428	5.488	5.434	14.1	0.10	178.92	45.83	224.75	OK
	B206	2.62					3.99	2.66	3.31	9.54	-3.28	-5.05	8.588	7.343	7.614	6.370	9.711	9.137	6.466	6.088	4.734	3.489	3.760	2.516	5.857	5.483	2.512	2.239						
PISO1	B207	0	2.63	VIG20X45	0.20	0.40	3.2	3.2	4.00	5.18	-3.28	-5.05	6.091	4.455	5.408	3.774	6.238	5.788	3.888	3.487	2.231	1.595	1.549	0.914	2.198	1.808	1.128	0.637	29.5	0.10	178.92	45.83	224.75	OK
	B207	2.62					13.71	10.78	4.00	5.18	3.26	8.98	28.483	28.208	28.737	28.555	28.651	28.345	29.508	29.445	13.580	13.407	13.844	13.663	13.758	13.703	14.607	14.551						
PISO1	B210	0	1.95	VIG50X45	0.50	0.40	14.48	11.77	20.58	11.02	3.26	8.98	42.434	38.825	42.318	38.469	40.467	39.012	40.314	39.259	22.846	18.991	22.704	18.855	21.353	20.198	20.900	19.745	71.1	0.10	178.92	114.58	293.40	OK
	B210	1.95					36.01	31.57	20.58	11.02	-3.26	-8.88	71.090	65.792	69.757	64.459	69.633	68.014	65.158	63.509	37.717	32.418	36.384	31.080	36.220	34.641	31.785	30.196						
PISO1	B211	0	3.26	VIG50X45	0.50	0.40	-70.03	-54.95	5.04	38.2	-3.26	-8.88	125.930	137.808	139.075	141.033	130.865	131.458	141.250	141.843	59.785	61.763	62.930	64.808	54.720	55.313	65.205	65.798	141.9	0.10	178.92	114.58	293.40	OK
	B211	3.26					-39.84	-33.83	5.04	38.2	5.08	4.34	76.388	76.512	78.853	79.776	71.123	71.360	78.670	78.907	33.976	35.100	33.240	31.364	25.911	25.948	33.458	33.493						
PISO1	B212	0	2.63	VIG50X45	0.50	0.40	-5.26	-0.94	0	27.44	5.08	4.34	3.845	4.294	5.192	5.840	0.821	0.818	5.776	5.971	1.127	1.776	1.674	3.321	1.897	1.702	3.258	3.453	43.0	0.10	178.92	114.58	293.40	OK
	B212	2.62					10.86	13.7	0	27.44	8.48	0.88	39.939	40.046	39.168	38.275	42.968	42.965	37.081	37.090	20.581	20.888	18.850	18.817	23.625	23.637	17.703	17.733						
PISO1	B213	0	2.63	VIG50X45	0.50	0.40	34.58	40.9	22.16	44.36	8.48	0.88	121.291	119.251	119.379	118.339	125.776	124.864	116.089	113.157	57.017	55.677	54.185	51.065	60.322	59.590	58.795	49.883	169.4	0.10	178.92	114.58	293.40	OK
	B213	2.62					78.7	63.54	22.16	44.36	4.52	5.34	165.875	161.955	162.350	158.340	169.350	166.184	160.644	159.468	78.725	74.885	76.130	71.390	82.210	81.034	73.494	72.318						
PISO1	B214	0	3.26	VIG50X45	0.50	0.40	-72.97	-57.39	8.64	34.4	-5.08	-4.34	141.185	143.790	143.761	146.366	135.867	137.848	145.454	146.215	61.904	64.509	64.480	67.085	57.586	58.367	66.173	66.954	146.4	0.10	178.92	114.58	293.40	OK
	B214	3.26					-40.97	-36.36	8.64	34.4	-8.48	-0.88	95.655	85.035	94.807	87.367	77.337	78.345	85.177	86.185	33.104	36.484	35.456	38.816	28.786	29.794	36.626	37.624						
PISO1	B215	0	2.63	VIG50X45	0.50	0.40	-7.86	-3.6	6.28	21.1	-8.48	-0.88	10.230	13.510	11.895	14.975	7.824	8.908	12.888	13.760	4.272	7.552	5.737	8.817	1.966	2.950	6.851	7.835	35.7	0.10	178.92	114.58	293.40	OK
	B215	2.62					16.27	11.04	6.28	21.1	-4.52	-5.34	33.366	33.986	31.604	29.204	35.672	34.952	29.798	28.076	17.445	15.045	15.680	13.283	19.751	19.031	13.875	12.155						
PISO1	B216	0	2.63	VIG50X45	0.50	0.40	30.88	44.67	16.26	37.08	-4.52	-5.34	113.107	107.524	109.328	104.666	115.470	114.088	105.910	104.528	51.873	47.300	49.085	44.413	55.233	53.864	45.676	44.304	159.1	0.10	178.92	114.58	293.40	OK
	B216	2.62					75.01	59.81	16.26	37.08	5.96	11.26	155.703	153.458	153.942	151.697	159.888	158.392	152.145	152.523	73.940	71.345	71.829	69.584	76.953	76.208	71.082	70.409						
PISO1	B217	0	3.26	VIG50X45	0.50	0.40	-80.39	-63.67	10.52	40.72	5.96	11.26	154.854	155.467	156.918	157.935	150.350	152.580	156.853	157.308	67.308	68.213	69.164	70.177	63.582	63.808	69.048	69.353	157.9	0.10	178.92	114.58	293.40	OK
	B217	3.26					-48.17	-42.54	10.52	40.72	-5.96	-11.26	95.412	99.674	98.877	103.539	90.714	91.812	103.183	101.364	38.391	42.053	41.856	45.518	33.083	34.781	45.244	46.343						
PISO1	B218	0	2.63	VIG50X45	0.50	0.40	-12.73	-7.5	7.6	26.98	-5.96	-11.26	19.388	22.302	21.838	24.851	16.274	17.179	24.772	25.676	7.868	10.883	10.519	13.533	4.655	5.854	13.453	14.357	27.3	0.10	178.92	114.58	293.40	OK
	B218	2.62					11.4	7.14	7.6	26.98	3.82	4.82	24.300	23.468	22.838	21.988	17.332	17.070	22.298	22.146	13.748	12.808	12.270	11.428	16.762	16.518	11.838	11.386						

PROYECYO: INSTITUCIÓN EDUCATIVA SIXTO MARIA
RESISTENCIA A CORTANTE PARA COLUMNAS
CHEQUEO PARA LA CONDICIÓN DESCRITA EN C.21.3.3 (a) - COLUMNAS S=60x40 16#7

f'c =	21.1	MPa	Estribos Φ =	9.5	mm
fy =	420	MPa	Av =	71	mm^2
$\Phi_{Cortante}$ =	0.75		Cantidad de ramas =	3	
bx =	0.40	m	S =	0.2	m
by =	0.60	m	Recub. =	0.05	m
Lcol =	3.40	m			

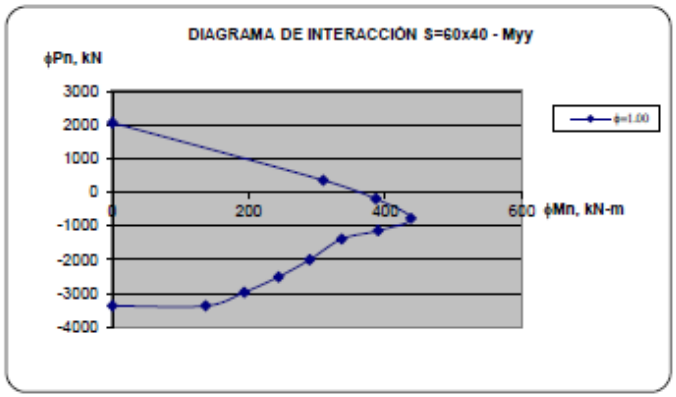
C.21.3.3.2(a) El cortante ΦVn no debe ser menor que la suma del cortante debido a flexión en curvatura inversa asociado con el desarrollo de los momentos nominales de la columna en cada extremo restringido de la longitud libre.

DATOS PARA LOS DIAGRAMAS DE ITERACCIÓN			
No.	Curve 1	0. degrees	
	P	M3	M2
1	-3366.00	0.00	0.00
2	-3366.00	178.98	0.00
3	-3008.00	258.98	0.00
4	-2575.00	325.99	0.00
5	-2085.00	385.17	0.00
6	-1480.00	439.70	0.00
7	-1117.00	519.73	0.00
8	-590.22	571.01	0.00
9	121.66	480.58	0.00
10	814.04	346.80	0.00
11	2058.27	0.00	0.00



P_{ua} =	-69.92	kN
P_{ub} =	-116.02	kN
ΦM_{na} =	504.92	kN-m
ΦM_{nb} =	510.78	kN-m
$V_{umáx}$ =	298.73	kN
ΦV_c =	184.42	kN
ΦV_o =	120.58	kN
ΦV_n =	305.00	kN
$\Phi V_n > V_{umáx}$ =	OK	

DATOS PARA LOS DIAGRAMAS DE ITERACCIÓN			
No.	Curve 7	90. degrees	
	P	M3	M2
1	-3366.00	0.00	0.00
2	-3366.00	0.00	136.75
3	-2959.00	0.00	193.70
4	-2503.00	0.00	243.78
5	-1997.00	0.00	289.20
6	-1384.00	0.00	336.22
7	-1139.00	0.00	369.35
8	-777.88	0.00	437.57
9	-193.97	0.00	385.96
10	356.13	0.00	309.02
11	2058.27	0.00	0.00



P_{ua} =	-36.21	kN
P_{ub} =	-76.27	kN
ΦM_{na} =	363.89	kN-m
ΦM_{nb} =	369.50	kN-m
$V_{umáx}$ =	215.70	kN
ΦV_c =	193.21	kN
ΦV_o =	126.32	kN
ΦV_n =	319.53	kN
$\Phi V_n > V_{umáx}$ =	OK	

PROYECTO : INSTITUCIÓN EDUCATIVA SIXTO MARIA
RESISTENCIA A CORTANTE PARA COLUMNAS
CHEQUEO PARA LA CONDICIÓN DESCRITA EN C.21.3.3 (b) - COLUMNAS S=60X40

f'c =	21.1	MPa	Estribos Φ =	9.5	mm
fy =	420	MPa	Av =	71	mm²
Φ Cortante =	0.75		Cantidad de ramas =	3	
bx =	0.60	m	S =	0.20	m
by =	0.40	m	Ω_o =	3.00	
			Recub. =	0.05	m

C.21.3.3.2(b) El cortante ΦVn no debe ser menor que el cortante máximo obtenido de las combinaciones de carga de diseño que incluyan E, con E incrementado por medio de Ωo.

Para cortante V2

$\Omega_o*V_{umáx}$ =	169.64	kN
ΦV_c =	123.01	kN
ΦV_o =	126.32	kN
ΦV_n =	249.33	kN
$\Phi V_n > \Omega_o*V_{umáx}$ =	OK	

Para cortante V3

$\Omega_o*V_{umáx}$ =	131.45	kN
ΦV_c =	117.42	kN
ΦV_o =	120.58	kN
ΦV_n =	237.99	kN
$\Phi V_n > \Omega_o*V_{umáx}$ =	OK	

8 ESPECIFICACIONES TÉCNICAS

Los materiales utilizados son:

Concreto	21.1 MPa para vigas, placas, zapatas y
columnas. Concreto	14 MPa (para concreto de limpieza).
Aceropara refuerzo	fy = 420 MPa para todos los diámetros.
Acero estructural	A36 pernos de anclaje y platinas
Acero estructural	A500 en perfiles metálicos

9 CONCLUSIONES Y RECOMENDACIONES

Habiendo finalizado el diseño y análisis estructural de la institución educativa del valle – sede Julio Cesar Arce Grupo 002 basado en la Norma Colombiana de Diseño y Construcción Sismo Resistente Ley 400 de 1997 (Modificada Ley 1229 de 2008) y Decreto 926 de Marzo de 2010, Decreto 092 del 17 de Enero de
2011, Decreto 0340 del 13 de Febrero de 2012 y en el Reglamento para Concreto Estructural ACI 318S-08, hemos llegado a las siguientes conclusiones y recomendaciones.

- Se cumplió satisfactoriamente con los objetivos del cálculo y diseño estructural mediante la aplicación de la norma sismo resistente (NSR-10) y el reglamento para concreto estructural ACI 318S-08, además de la ayuda del software ETABS V9.7.4 se puede garantizar el buen funcionamiento de la estructura que presenta una buena respuesta ante un evento sísmico.
- La revisión de los desplazamientos laterales (derivas) de la estructura teniendo en cuenta las direcciones "X" y "y", nos arrojó que los resultados obtenidos son aceptables permitiendo un buen funcionamiento ante la actuación de un sismo y que cumple con lo establecido en la norma sismo resistente (NSR-10).
- En cuanto a la revisión de columnas y vigas determinamos que cumplen con los requisitos, ya que en estructuras de edificios aporticados es obligatorio que los miembros horizontales fallen antes que los verticales, permitiendo de esa manera un retraso del colapso total de la estructura.
- Para la construcción de la estructura se recomienda llevar un estricto control en la calidad de los materiales a utilizar, ya que estos deberán cumplir con requisitos especiales para el buen funcionamiento de la edificación. Además que estos deberán ser supervisados a la hora de la puesta en marcha por el ingeniero residente.

10 BIBLIOGRAFÍA

•Norma Colombiana de Diseño y Construcción Sismo Resistente Ley 400 de 1997 (Modificada Ley 1229 de 2008) y Decreto 926 de Marzo de 2010, Decreto 092 del 17 de Enero de 2011, Decreto 0340 del 13 de Febrero de 2012
•Reglamento para Concreto Estructural ACI 318S-08.

ELABORACIÓN DE DIAGNÓSTICOS, ESTUDIOS TÉCNICOS, AJUSTES A DISEÑOS O DISEÑOS INTEGRALES, CONSTRUCCIÓN Y PUESTA EN FUNCIONAMIENTO DE LAS OBRAS DE INFRAESTRUCTURA EDUCATIVA – UBICADAS EN EL DEPARTAMENTO DE VALLE DEL CAUCA – GRUPO 02

Contrato No. PAF-JU02-G02DC-2015

INFORME CÁLCULO Y ANÁLISIS ESTRUCTURAL INSTITUCIÓN EDUCATIVA DEL VALLE – SEDE SIXTO MARÍA ROJAS-BAÑOS.

BOGOTÁ
2017

CONTROL DE REVISIONES

REVISIÓN	FECHA	OBSERVACIONES
1	30/12/16	Primera Redacción

Elaborado por: Edgar Rolando Barrera Firma:	**Revisado por**: Javier José Carrillo Ortega Fecha: febrero 2017 Firma:	**Aprobado por:** Director de Interventoría Fecha: Firma:

TABLA DE CONTENIDO

LISTA DE FOTOGRAFÍAS

1 INTRODUCCIÓN

El presente documento contiene las memorias de análisis y diseño estructural correspondiente al proyecto de la "INSTITUCIÓN EDUCATIVA DEL VALLE – SEDE SIXTO MARÍA ROJAS-BAÑOS" ubicado en el municipio de JAMUNDÍ en el departamento de VALLE DEL CAUCA de acuerdo al contrato No. PAF-JU02-G02DC-2015 realizando el estudio de acuerdo a la Norma Colombiana de Diseño y Construcción Sismo Resistente Ley 400 de 1997 (Modificada Ley 1229 de 2008) y Decreto 926 de Marzo de 2010, Decreto 092 del 17 de Enero de 2011, Decreto 0340 del 13 de Febrero de 2012 y en el Reglamento para Concreto Estructural ACI 318S-08.

Para la evaluación de la edificación se ha seguido un proceso normativo que incluye las etapas de inspección, evaluación, pruebas y ensayos, revisión analítica, propuesta de intervención y soluciones constructivas, que tomen en cuenta los aspectos de resistencia, ductilidad, comportamiento y estabilidad de la estructura.

2 DESCRIPCIÓN DEL TRABAJO DE OFICINA

De acuerdo a los planos arquitectónicos y visitas realizadas en campo se procedió al desarrollo del estudio y análisis estructural con la ayuda de diferentes programas tales como ETABS v9.7.4, el cual tiene en cuenta los efectos de segundo orden. Por otro lado se siguieron las recomendaciones descrita en el respectivo estudio de suelos

3 DESCRIPCIÓN DE LOS CRITERIOS BÁSICOS DE DISEÑO

El proyecto se soluciona mediante el diseño de una estructura a porticada, utilizando para la cubierta placa de e=0.12 m maciza, con vigas descolgadas de h=0.45 m según lo indicado en los planos estructurales. Se manejan luces que varían entre 3.00 m y 6.00 m en los dos sentidos de la estructura

4 NORMAS Y CÓDIGOS A LOS CUALES SE CIÑEN LOS DISEÑOS

El diseño de todas las estructuras se realizó basado en la Norma Colombiana de Diseño y Construcción Sismo Resistente Ley 400 de 1997 (Modificada Ley 1229 de 2008) y Decreto 926 de Marzo de 2010, Decreto 092 del 17 de Enero de 2011, Decreto 0340 del 13 de Febrero de 2012 y en el Reglamento para Concreto Estructural ACI 318S-08.

5 DESCRIPCIÓN DE LA METODOLOGÍA DE DISEÑO EMPLEADA.

El proyecto se soluciona mediante el diseño de una estructura a porticada, utilizando para la cubierta placa de e=0.12 m maciza, con vigas descolgadas de h=0.45 m según lo indicado en los planos estructurales. Se manejan luces que varían entre 3.00 m y 6.00 m en los dos sentidos de la estructura

Las cargas horizontales fueron distribuidas entre los diferentes pórticos en proporción a su rigidez y teniendo en cuenta los efectos de torsión.

El dimensionamiento dado a todos los elementos que intervienen en las estructuras satisfacen los requerimientos de solicitación ocasionados por las derivas presentes. Las cargas vivas de diseño son: **5.00 kN/ m²** para cubiertas.

Para la cimentación se siguieron las recomendaciones descritas en el respectivo estudio de suelos, por lo cual se diseñaron zapatas apoyadas a una profundidad de 1.00m desde el nivel actual del terreno. Los cimientos estarán conectados entre sí por vigas de amarre diseñadas según lo establecido en A.3.6.4.2 de la NSR-10. La capacidad portante de seguridad admisible del suelo es **0.12 MPa** y el tipo de suelo es **E**.

6 DESCRIPCIÓN Y ANÁLISIS DE LAS CONDICIONES EXISTENTES

El sitio donde se procederá a la construcción de la estructura se encuentra ubicado una edificación existente, como se evidenciara en las fotos mostradas a continuación.

1. Fotografía Estructura existente

Fuente: Propia

2. Fotografía Estructura existente

Fuente: Propia

3. Fotografía Estructura existente

Fuente: Propia

4. Fotografía Estructura existente

Fuente: Propia

MEMORIAL DE RESPONSABILIDAD

JAMUNDI, Mayo de 2017.

Señores
PLANEACION MUNICIPAL
La Ciudad

Yo, **EDGAR ROLANDO BARRERA,** ingeniero civil con Matrícula Profesional Nº **15202-102710** de **BOYACÁ,** debidamente registrado en el consejo profesional de Ingeniería y Arquitectura de Boyacá, presento los cálculos y diseños estructurales elaborados de acuerdo a los requerimientos de la **NORMA COLOMBIANA DE DISEÑO Y CONSTRUCCIÓN SISMO RESISTENTE LEY 400 DE 1997 (MODIFICADA LEY 1229 DE 2008) Y DECRETO 926 DE MARZO DE 2010**, para el I.E. SIXTO MARIA ROJAS-BAÑOS ubicado en el municipio de JAMUNDI (VALLE DEL CAUCA), declaro que asumo la responsabilidad por los perjuicios que causa de ellos puedan deducirse, exonerando a PLANEACION de cualquier responsabilidad.

Acepto y reconozco que la revisión efectuada por PLANEACION no constituye una aprobación al Diseño Estructural, sino una verificación del cumplimiento de la **NORMA COLOMBIANA DE DISEÑO Y CONSTRUCCIÓN SISMO RESISTENTE**.

Atentamente,

_____

EDGAR ROLANDO BARRERA

ING. ESTRUCTURAL

T.P. 15202-102710 BYC


REPUBLICA DE COLOMBIA
CONSEJO PROFESIONAL NACIONAL DE INGENIERIA
Y SUS PROFESIONES AUXILIARES
MAT. No 15202103710BYC
INGENIERO CIVIL
FECHA 18/12/2003
BARRERA SALINAS
EDGAR ROLANDO
C.C. 7175981
UNIVERSIDAD PEDAGOGICA Y
TECNOLOGICA DE COLOMBIA
PRESIDENTE DEL CONSEJO

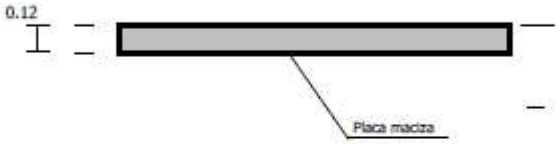
7 MEMORIA DE CÁLCULO

7.1 AVALUO DE CARGAS

PROYECTO: INSTITUCIÓN EDUCATIVA SIXTO MARIA-BAÑOS

AVALUO DE CARGAS

PLACA MACIZA CUBIERTA



Placa maciza e=0.12m	0.12x24		2.88 kN/m²
Impermeabilización	20x0.05		1.00 kN/m²
		CM	3.88 kN/m²
		CV	5.00 kN/m²
		CR	8.88 kN/m²

CU = 1.2x3.88+1.6x5 = ***12.7 kN/m²***

Espesor de placa equivalente:

e=CM/24 0.162 m

7.2 ANALISIS SISMICO

PROYECTO: INSTITUCIÓN EDUCATIVA SIXTO MARIA-BAÑOS

ANÁLISIS SÍSMICO (ESPECTRO DE DISEÑO NSR-10)

ZONA DE AMENAZA SÍSMICA
ALTA

EFECTOS LOCALES

Perfil de Suelo	E
Coeficiente Aa	0.25
Coeficiente Av	0.25

COEFICIENTE DE IMPORTANCIA

Grupo de Uso	III
Coeficiente de importancia I	1.25

PERIODO FUNDAMENTAL DE LA EDIFICACIÓN

$T_a = C_t h^{\alpha}$		
C_t =	0.047	
h =	4.00	m
α =	0.90	
T_a=	0.16	Seg

VARIACIÓN COEFICIENTE DE CAPACIDAD DE DISIPACIÓN DE ENERGÍA

Ro: Coeficiente de capacidad de disipación de energía básico
R: Coeficiente de capacidad de disipación de energía, para ser empleado en el diseño.
ϕ_a: Coeficiente de reducción de R causado por irregularidades en altura de la edificación
ϕ_p: Coeficiente de reducción de R causado por irregularidades en planta de la edificación
ϕ_r: Coeficiente de reducción de R causado por ausencia de redundancia en el sistema estructural de resistencia sísmica

Ro	7.00
ϕ_a	1.00
ϕ_p	1.00
ϕ_r	0.75
ϕ	1.00
R	5.25

TIPO	DESCRIPCIÓN	VALOR
		ϕ_a: 1.00
		ϕ_p: 1.00
	REDUNDANCIA	ϕ_r: 0.75
	UNIONES SOLDADAS	ϕ: 1.00

ESPECTRO DE DISEÑO

Fa: Factor de ampliación de la aceleración.
Fv: Factor de ampliación de la aceleración en el rango de velocidades constantes.
Sa: Valor del espectro de aceleraciones de diseño para un periodo de vibración dado.
Aa: Coeficiente que representa la aceleración horizontal pico efectiva para diseño.
Av: Coeficiente que representa la velocidad horizontal pico efectiva para diseño.
T: Periodo de vibración del sistema elástico, en segundos.
Tc: Periodo de vibración, en segundos, correspondiente a la transición entre la zona de aceleración constante del espectro de diseño, para periodos cortos, y la parte descendiente del mismo.
Tl: Periodo de vibración, en segundos, correspondiente al inicio de la zona de desplazamiento aproximadamente constante del espectro de diseño para periodos largos.

ZONA DE AMENAZA ALTA		
To:	0.21	Seg
Tc:	0.99	Seg
Tl:	7.20	Seg
Aa:	0.25	
Av:	0.25	
Fa:	1.45	
Fv:	3.00	

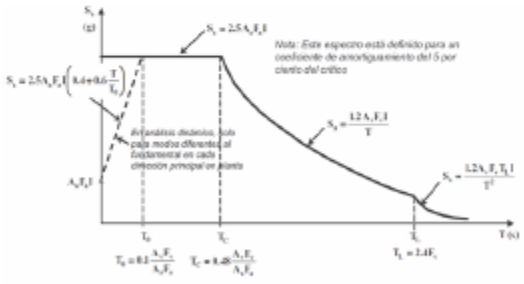
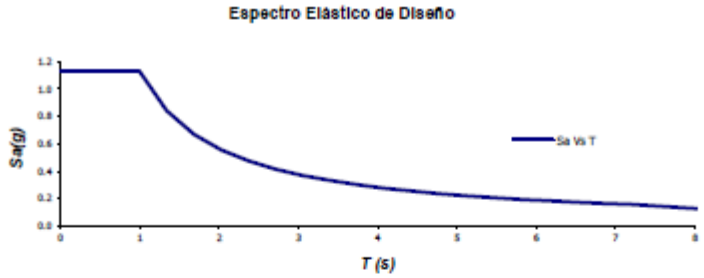
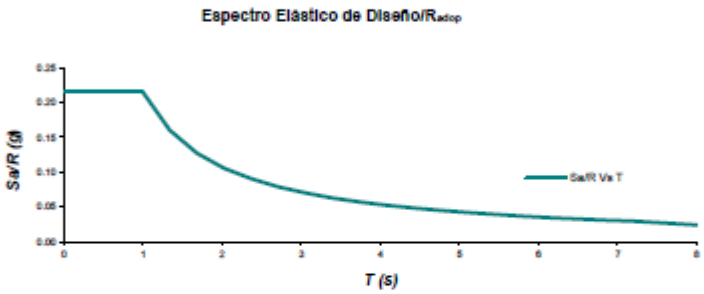


Figura A.2.6-1 — Espectro Elástico de Aceleraciones de Diseño como fracción de g

T (Seg)	Sa (%g)	Sa/$R_{adoptado}$ (%g)
0.00	1.133	0.216
0.05	1.133	0.216
0.10	1.133	0.216
0.16	1.133	0.216
0.21	1.133	0.216
0.40	1.133	0.216
0.60	1.133	0.216
0.80	1.133	0.216
0.99	1.133	0.216
1.34	0.841	0.160
1.68	0.669	0.127
2.03	0.555	0.106
2.37	0.474	0.090
2.72	0.414	0.079
3.06	0.367	0.070
3.41	0.330	0.063
3.75	0.300	0.057
4.10	0.275	0.052
4.44	0.253	0.048
4.79	0.235	0.045
5.13	0.219	0.042
5.48	0.205	0.039
5.82	0.193	0.037
6.17	0.182	0.035
6.51	0.173	0.033
6.86	0.164	0.031
7.20	0.156	0.030
8.20	0.120	0.023
9.20	0.096	0.018





Sistema de resistencia Sísmica: Pórticos resistentes a momentos con Capacidad Especial de Disipación de Energía (DES).

Nota: El sistema de pórtico es un sistema estructural compuesto por un pórtico espacial, resistente a momentos, esencialmente completo, sin diagonales, que resiste todas las cargas verticales y las fuerzas horizontales.

MODELO MATEMÁTICO

Modelo Tridimensional con Diafragma Rígido: En este modelo los entrepisos se consideran diafragmas infinitamente rigidos en su propio plano. La masa de cada diafragma se considera concentrada en su centro de masa. Los efectos torsionales accidentales son incluidos haciendo ajustes en la localización de los centros de masa de los diafragmas.
Los efectos direccionales son tomados en cuenta a través de las componentes de los desplazamientos de los grados de libertad horizontales ortogonales del diafragma.

7.2.1 ANALISIS SISMICO – UMBRAL DE DAÑO

PROYECTO: INSTITUCIÓN EDUCATIVA SIXTO MARIA-BAÑOS

ANÁLISIS SÍSMICO (ESPECTRO DE UMBRAL DE DAÑO NSR-10)

ZONA DE AMENAZA SÍSMICA
ALTA

EFECTOS LOCALES

Perfil de Suelo	E
Coeficiente Ad	0.27
Coeficiente Fv	2.99

COEFICIENTE DE IMPORTANCIA

Grupo de Uso	III
Coeficiente de importancia I	1.25
Coeficiente de Sitio S:	3.74

ESPECTRO DE DISEÑO

Sad: Valor del espectro de aceleraciones del umbral de daño para un periodo de vibración dado.
Ad: Máxima aceleración pico efectiva para el umbral de daño.
T: Periodo de vibración del sistema elástico, en segundos.
T_{Cd}: Periodo de vibración, en segundos, correspondiente a la transición entre la zona de aceleración constante del espectro sísmico del umbral de daño, para periodos cortos, y la parte descendiente del mismo.
T_{Ld}: Periodo de vibración, en segundos, correspondiente a la transición entre la zona de desplazamiento constante del espectro sísmico del umbral de daño, para periodos largos.

Ad: 0.27
T_{Cd}: 1.87 Seg
T_{Ld}: 8.97 Seg

T (Seg)	Sad (%g)
0.00	0.270
0.05	0.378
0.10	0.486
0.15	0.594
0.20	0.702
0.25	0.810
0.45	0.810
0.65	0.810
0.86	0.810
1.06	0.810
1.26	0.810
1.46	0.810
1.67	0.810

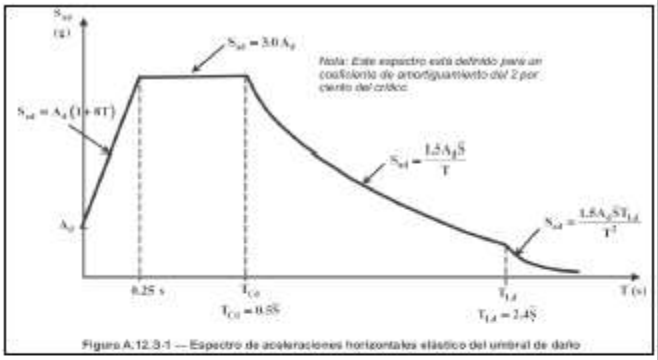
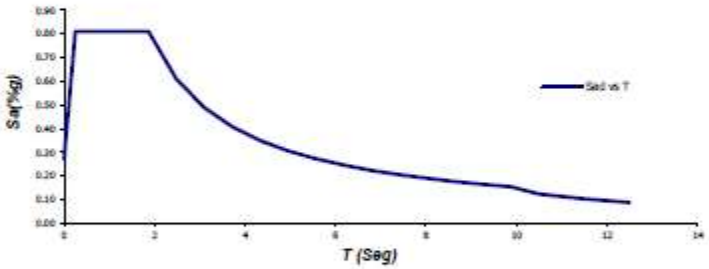


Figura A.12.3-1 — Espectro de aceleraciones horizontales elástico del umbral de daño

1.87	0.810
2.49	0.609
3.10	0.488
3.72	0.407
4.33	0.349
4.95	0.306
5.57	0.272
6.18	0.245
6.80	0.223
7.42	0.204
8.03	0.188
8.65	0.175
9.27	0.163
9.88	0.153
10.50	0.123
11.50	0.103
12.50	0.087

Espectro Del Umbral de Daño



Sistema de resistencia Sísmica: Pórticos resistentes a momentos con Capacidad Especial de Disipación de Energía (DES).

Nota: El sistema de pórtico es un sistema estructural compuesto por un pórtico espacial, resistente a momentos, esencialmente completo, sin diagonales, que resiste todas las cargas verticales y las fuerzas horizontales.

MODELO MATEMÁTICO

Modelo Tridimensional con Diafragma Rígido: En este modelo los entrepisos se consideran diafragmas infinitamente rigidos en su propio plano. La masa de cada diafragma se considera concentrada en su centro de masa. Los efectos torsionales accidentales son incluidos haciendo ajustes en la localización de los centros de masa de los diafragmas.
Los efectos direccionales son tomados en cuenta a través de las componentes de los desplazamientos de los grados de libertad horizontales ortogonales del diafragma.

7.2.2 CALCULO CORTANTE BASAL

PROYECTO: INSTITUCIÓN EDUCATIVA SIXTO MARIA-BAÑOS
CALCULO DEL CORTANTE BASAL DE LA ESTRUCTURA (ESPECTRO DE DISEÑO NSR-10)

CALCULO DEL CORTANTE BASAL DE LA ESTRUCTURA

$H_{estructura}$=	4.00	m	
Tipo de Perfil:	E		
Aa =	0.25		
Av =	0.25		
Fa =	1.45		
Fv =	3.00		
T_c =	0.99	Seg	
C_t =	0.047		
α =	0.90		
T_a =	0.16	Seg	
C_u =	1.20		
$C_u T_a$ =	0.20	Seg	
$T_{modelación\ estructural}$ =	0.18	Seg	
ΔT =	9.98	%	Ok!
$T_{adoptado}$ =	0.18	Seg	
S_a =	1.130		S_a obtenido del espectro de diseño
g =	9.81	m/s^2	
M =	40.50	Ton	Masa obtenida del modelo
V_s =	448.95	kN	
90% Vs =	404.06	kN	Cortante basal para comparación de acuerdo a A.5.4.5 NSR-10

MODELO INICIAL
Response Spectrum Base Reactions

PORCENTAJE PARA REVISIÓN DE CORTANTE BASAL DE ACUERDO A A.5.4.5 NSR-10: 90.0 %

	F1	F2	Total	Factor		g corregido
$V_{s(x)}$=	352.44	0	352.44	1.146	11.247	Se aplica en SISMO X
$V_{s(y)}$=	0	403	403.00	1.003	9.836	Se aplica en SISMO Y

MODELO CORREGIDO
Response Spectrum Base Reactions

	F1	F2	Total	90% Vs
$V_{s(x)}$=	352.44	0	352.44	404.1
$V_{s(y)}$=	0	403	403.00	404.1

PROYECTO: INSTITUCIÓN EDUCATIVA SIXTO MARIA-BAÑOS
CALCULO DEL CORTANTE BASAL DE LA ESTRUCTURA (ESPECTRO DE UMBRAL DE DAÑO NSR-10)

CALCULO DEL CORTANTE BASAL DE LA ESTRUCTURA

$H_{edificio}$=	4.00	m	
Tipo de Perfil:	E		
Ad =	0.05		
Fv =	3.50		
C_t =	0.047		
α =	0.90		
T_a =	0.16	Seg	
C_u =	1.20		
$C_u T_a$ =	0.20	Seg	
$T_{modelación\ estructural}$ =	0.18	Seg	
ΔT =	9.98	%	Ok!
$T_{adoptado}$ =	0.16	Seg	
S_a =	1.130		S_a obtenido del espectro de diseño
g =	9.81	m/s^2	
M =	40.50	Ton	Masa obtenida del modelo
V_s =	448.95	kN	
	456.23		

MODELO INICIAL
Response Espectrum Base Reactions

PORCENTAJE PARA REVISIÓN DE CORTANTE BASAL DE ACUERDO A A.5.4.5 NSR-10: 100.0 %

	F1	F2	Total	Factor		g corregido
$V_{s(x)}$=	203.16	0	203.16	2.210	21.679	Se aplica en SISMO X
$V_{s(y)}$=	0	227.25	227.25	1.976	19.381	Se aplica en SISMO Y

MODELO CORREGIDO
Response Espectrum Base Reactions

	F1	F2	Total	100% Vs
$V_{s(x)}$=	203.16	0	203.16	449.0
$V_{s(y)}$=	0	227.25	227.25	449.0

7.2.3 DERIVAS

PROYECTO: INSTITUCIÓN EDUCATIVA SIXTO MARIA-BAÑOS

CÁLCULO DE DERIVAS MÁXIMAS

ALTURA DE CUBIERTA 4.00 m
ALTURA DE BASE 0.00 m

Deriva Máxima Permitida 1.00 %

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS FUERZA SÍSMICA Desplazamiento X	Desplazamiento Y	Deriva Δ m	Deriva Δ %	Observación
CUBIERTA	1	COMDER1 MAX	0.0137	0.0147	0.02009	0.50	OK
CUBIERTA	1	COMDER1 MIN	-0.0137	-0.0147	0.02009	0.50	OK
CUBIERTA	1	COMDER2 MAX	0.0049	0.0218	0.02234	0.56	OK
CUBIERTA	1	COMDER2 MIN	-0.0049	-0.0218	0.02234	0.56	OK
BASE	1	COMDER1 MAX	0	0	–	–	–
BASE	1	COMDER1 MIN	0	0	–	–	–
BASE	1	COMDER2 MAX	0	0	–	–	–
BASE	1	COMDER2 MIN	0	0	–	–	–
CUBIERTA	2	COMDER1 MAX	0.0225	0.0147	0.02688	0.67	OK
CUBIERTA	2	COMDER1 MIN	-0.0225	-0.0147	0.02688	0.67	OK
CUBIERTA	2	COMDER2 MAX	0.0075	0.0218	0.02305	0.58	OK
CUBIERTA	2	COMDER2 MIN	-0.0075	-0.0218	0.02305	0.58	OK
BASE	2	COMDER1 MAX	0	0	–	–	–
BASE	2	COMDER1 MIN	0	0	–	–	–
BASE	2	COMDER2 MAX	0	0	–	–	–
BASE	2	COMDER2 MIN	0	0	–	–	–
CUBIERTA	3	COMDER1 MAX	0.0225	0.0147	0.02688	0.67	OK
CUBIERTA	3	COMDER1 MIN	-0.0225	-0.0147	0.02688	0.67	OK
CUBIERTA	3	COMDER2 MAX	0.0075	0.0218	0.02305	0.58	OK
CUBIERTA	3	COMDER2 MIN	-0.0075	-0.0218	0.02305	0.58	OK
BASE	3	COMDER1 MAX	0	0	–	–	–
BASE	3	COMDER1 MIN	0	0	–	–	–
BASE	3	COMDER2 MAX	0	0	–	–	–
BASE	3	COMDER2 MIN	0	0	–	–	–
CUBIERTA	4	COMDER1 MAX	0.0137	0.0147	0.02009	0.50	OK
CUBIERTA	4	COMDER1 MIN	-0.0137	-0.0147	0.02009	0.50	OK
CUBIERTA	4	COMDER2 MAX	0.0049	0.0218	0.02234	0.56	OK
CUBIERTA	4	COMDER2 MIN	-0.0049	-0.0218	0.02234	0.56	OK
BASE	4	COMDER1 MAX	0	0	–	–	–
BASE	4	COMDER1 MIN	0	0	–	–	–
BASE	4	COMDER2 MAX	0	0	–	–	–
BASE	4	COMDER2 MIN	0	0	–	–	–

PROYECTO: INSTITUCIÓN EDUCATIVA SIXTO MARIA-BAÑOS

CÁLCULO DE DERIVAS MÁXIMAS (ESPECTRO DE UMBRAL DE DAÑO)

ALTURA DE CUBIERTA **4.00** m
ALTURA DE BASE **0.00** m

Deriva Máxima Permitida **0.40** %

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS FUERZA SÍSMICA		Deriva Δ	Deriva Δ	Observación
			Desplazamiento X	Desplazamiento Y	m	%	
CUBIERTA	1	COMDERUM1 MAX	0.00768	0.00824	0.01126	0.28	OK
CUBIERTA	1	COMDERUM1 MIN	-0.00768	-0.00824	0.01126	0.28	OK
CUBIERTA	1	COMDERUM2 MAX	0.00272	0.01248	0.01277	0.32	OK
CUBIERTA	1	COMDERUM2 MIN	-0.00272	-0.01248	0.01277	0.32	OK
BASE	1	COMDERUM1 MAX	0.00000	0.00000	–	–	–
BASE	1	COMDERUM1 MIN	0.00000	0.00000	–	–	–
BASE	1	COMDERUM2 MAX	0.00000	0.00000	–	–	–
BASE	1	COMDERUM2 MIN	0.00000	0.00000	–	–	–
CUBIERTA	2	COMDERUM1 MAX	0.01288	0.00824	0.01529	0.38	OK
CUBIERTA	2	COMDERUM1 MIN	-0.01288	-0.00824	0.01529	0.38	OK
CUBIERTA	2	COMDERUM2 MAX	0.00424	0.01248	0.01318	0.33	OK
CUBIERTA	2	COMDERUM2 MIN	-0.00424	-0.01248	0.01318	0.33	OK
BASE	2	COMDERUM1 MAX	0.00000	0.00000	–	–	–
BASE	2	COMDERUM1 MIN	0.00000	0.00000	–	–	–
BASE	2	COMDERUM2 MAX	0.00000	0.00000	–	–	–
BASE	2	COMDERUM2 MIN	0.00000	0.00000	–	–	–
CUBIERTA	3	COMDERUM1 MAX	0.01288	0.00824	0.01529	0.38	OK
CUBIERTA	3	COMDERUM1 MIN	-0.01288	-0.00824	0.01529	0.38	OK
CUBIERTA	3	COMDERUM2 MAX	0.00424	0.01248	0.01318	0.33	OK
CUBIERTA	3	COMDERUM2 MIN	-0.00424	-0.01248	0.01318	0.33	OK
BASE	3	COMDERUM1 MAX	0.00000	0.00000	–	–	–
BASE	3	COMDERUM1 MIN	0.00000	0.00000	–	–	–
BASE	3	COMDERUM2 MAX	0.00000	0.00000	–	–	–
BASE	3	COMDERUM2 MIN	0.00000	0.00000	–	–	–
CUBIERTA	4	COMDERUM1 MAX	0.00768	0.00824	0.01126	0.28	OK
CUBIERTA	4	COMDERUM1 MIN	-0.00768	-0.00824	0.01126	0.28	OK
CUBIERTA	4	COMDERUM2 MAX	0.00272	0.01248	0.01277	0.32	OK
CUBIERTA	4	COMDERUM2 MIN	-0.00272	-0.01248	0.01277	0.32	OK
BASE	4	COMDERUM1 MAX	0.00000	0.00000	–	–	–
BASE	4	COMDERUM1 MIN	0.00000	0.00000	–	–	–
BASE	4	COMDERUM2 MAX	0.00000	0.00000	–	–	–
BASE	4	COMDERUM2 MIN	0.00000	0.00000	–	–	–

7.2.4 LONGITUD DE DESARROLLO

PROYECTO: INSTITUCION EDUCATIVA SIXTO MARIA-BAÑO
LONGITUD DE DESARROLLO (Ldc)

Para Fy= **420** Mpa

Para F'c= **21.1** Mpa

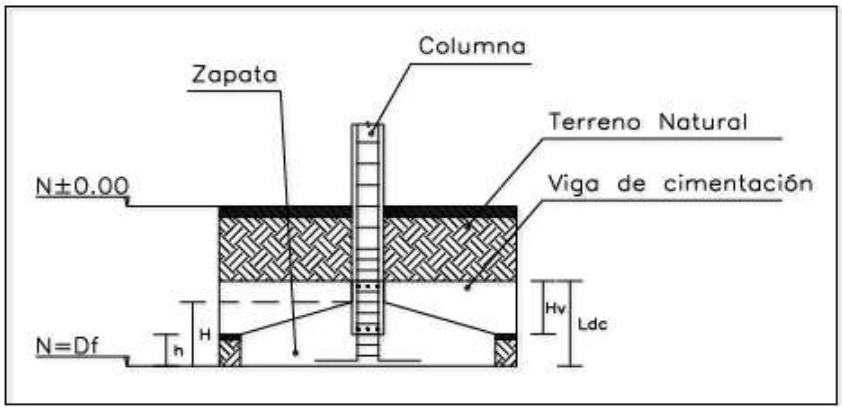
Barra No	Ldc (mm)	≥ 0.043 d_b F_y	Ldc + S
3	209	OK	279
4	279	OK	349
5	349	OK	419
6	420	OK	490
7	488	OK	558
8	558	OK	628

$$Ldc = \frac{0.24\ db\ Fy}{\lambda\sqrt{F'_c}} \geq 0.043\ d_b\ Fy$$ Numeral C.12.3.2 NSR-10

$$Ldc \geq 200\ mm$$

Donde: d_b : Diametro de la barra en mm
λ: 1.00 para concreto de peso normal (C.12.2.4) 1.00
La constante 0.043 esta en (mm^2/N)

h=	**0.30**	m	Altura zapata
H=	**Var.**	m	Altura peralte zapata
Hv=	**0.40**	m	Altura viga de amarre
S =	**0.07**	m	Recubrimiento
Ldc=	**0.63**	m	Longitud de desarrollo (Altura de empotramiento de cada columna)



7.3 DISEÑO DE CIMENTACION

DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INSTITUCIÓN EDUCATIVA DEL VALLE, SEDE SIXTO MARÍA ROJAS - BAÑOS

RESUMEN DISEÑO

CARGA ADMISIBLE 12.00 Ton/m² VERTICALES
CARGA ADMISIBLE S 15.96 Ton/m² SISMO

ZAPATA	B_z (m)	L_z (m)	H (m)	q_{max} (Ton/m²) CARGA VERTICAL	q_{max} (Ton/m²) SISMO	q_{min} (Ton/m²) SISMO	CHEQUEO	TIPO DE ZAPATA	REFUERZO EN X	REFUERZO EN Y
A1-1A	2.20	2.20	0.40	6.78	10.96	0.22	O.K.		12 VARILLAS No. 5 L = 2.1 m. @ 19.09 cm.	12 VARILLAS No. 5 L = 2.1 m. @ 19.09 cm.
A1-2A	2.40	2.40	0.40	8.11	13.46	0.43	O.K.		20 VARILLAS No. 5 L = 2.3 m. @ 12.11 cm.	20 VARILLAS No. 5 L = 2.3 m. @ 12.11 cm.
B1-2A	2.40	2.40	0.40	8.11	11.40	2.74	O.K.		16 VARILLAS No. 5 L = 2.3 m. @ 15.33 cm.	16 VARILLAS No. 5 L = 2.3 m. @ 15.33 cm.
B1-1A	2.20	2.20	0.40	6.78	9.55	2.83	O.K.		10 VARILLAS No. 5 L = 2.1 m. @ 23.33 cm.	10 VARILLAS No. 5 L = 2.1 m. @ 23.33 cm.

DISEÑO VIGAS DE AMARRE

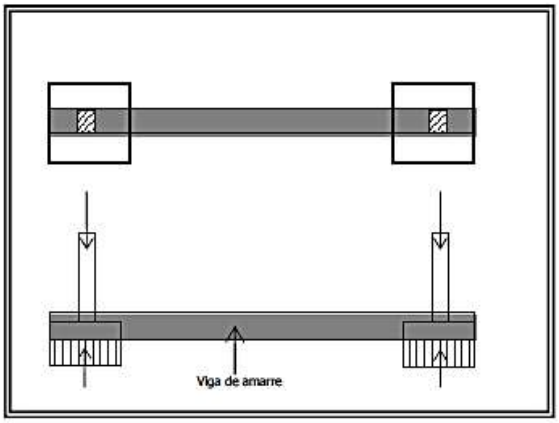
PROYECTO: INSTITUCIÓN EDUCATIVA SIXTO MARIA-BAÑOS

VIGA DE AMARRE TIPO

f'c = 21.1 MPa
fy = 420 MPa

b = 0.40 m
h = 0.40 m

Pmáx = 221.61 kN



De acuerdo a el numeral A.3.6.4.2 de la NSR-10 tenemos:

Aa = 0.25
Paxial = 0.25*Aa*Pmáx
Paxial = *8.3* kN

DISEÑO A TENSIÓN

As = 1.7*8.310375/(0.90*420)
As = 0.37 cm^2

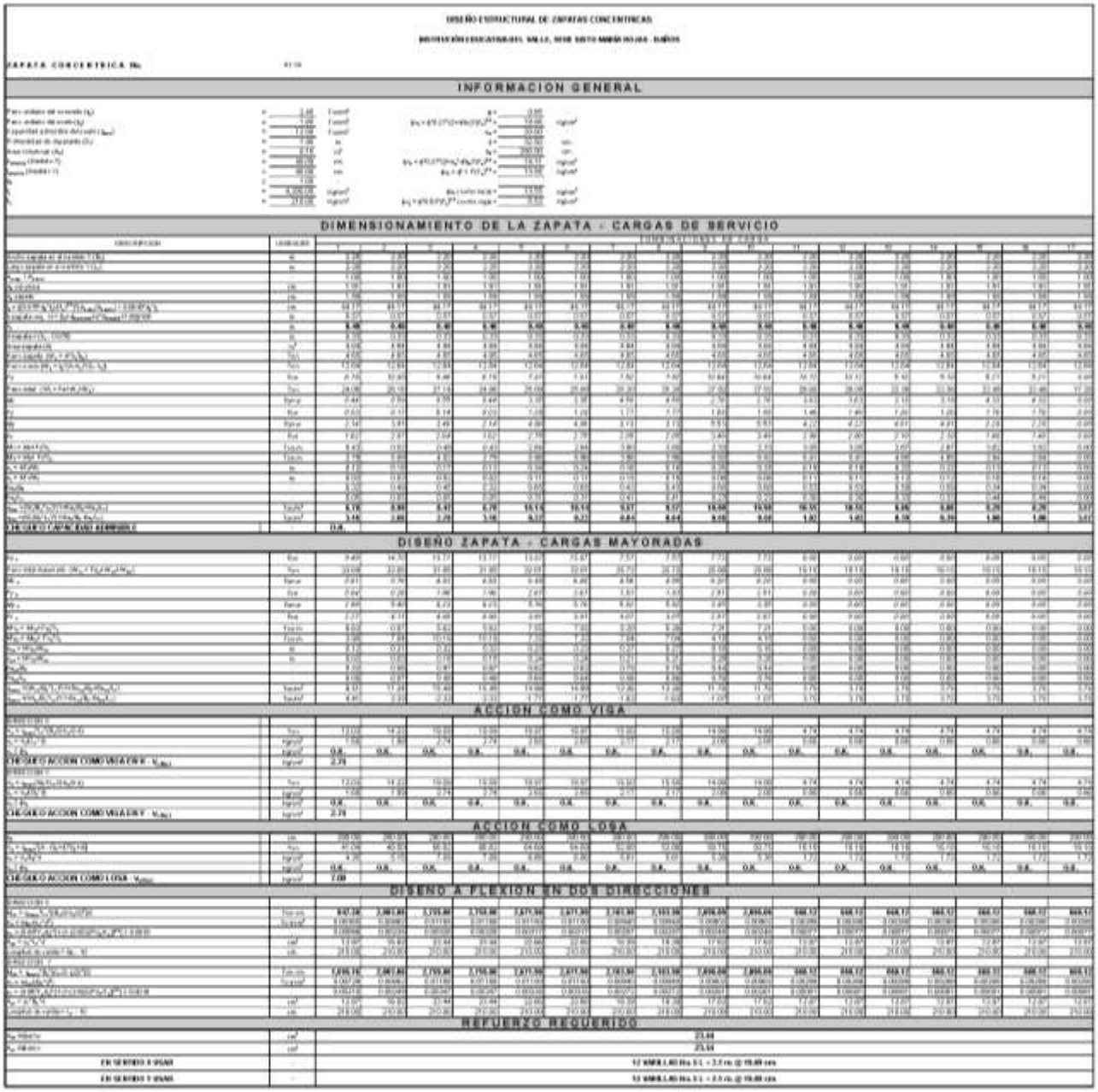
DISEÑO A COMPRESIÓN

P com = 1.7*8.310375
P com = *14.1* kN

Para esta carga la sección requiere cuantía mínima:

As = 0.00333*0.4*0.35
As = 4.66 cm^2

Se suministra un refuerzo constituido por 4#4 arriba y abajo (como refuerzo mínimo).



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

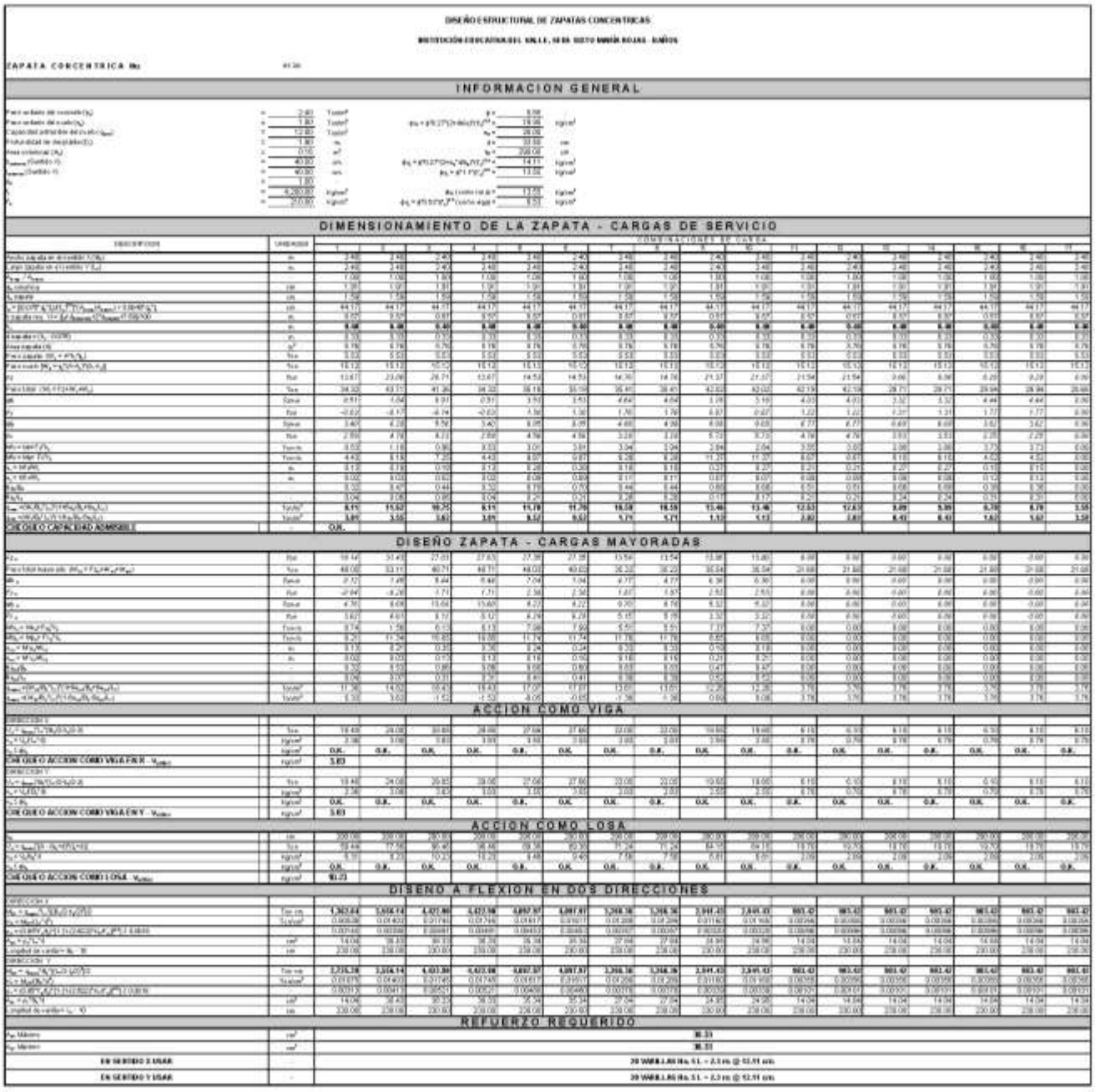
DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

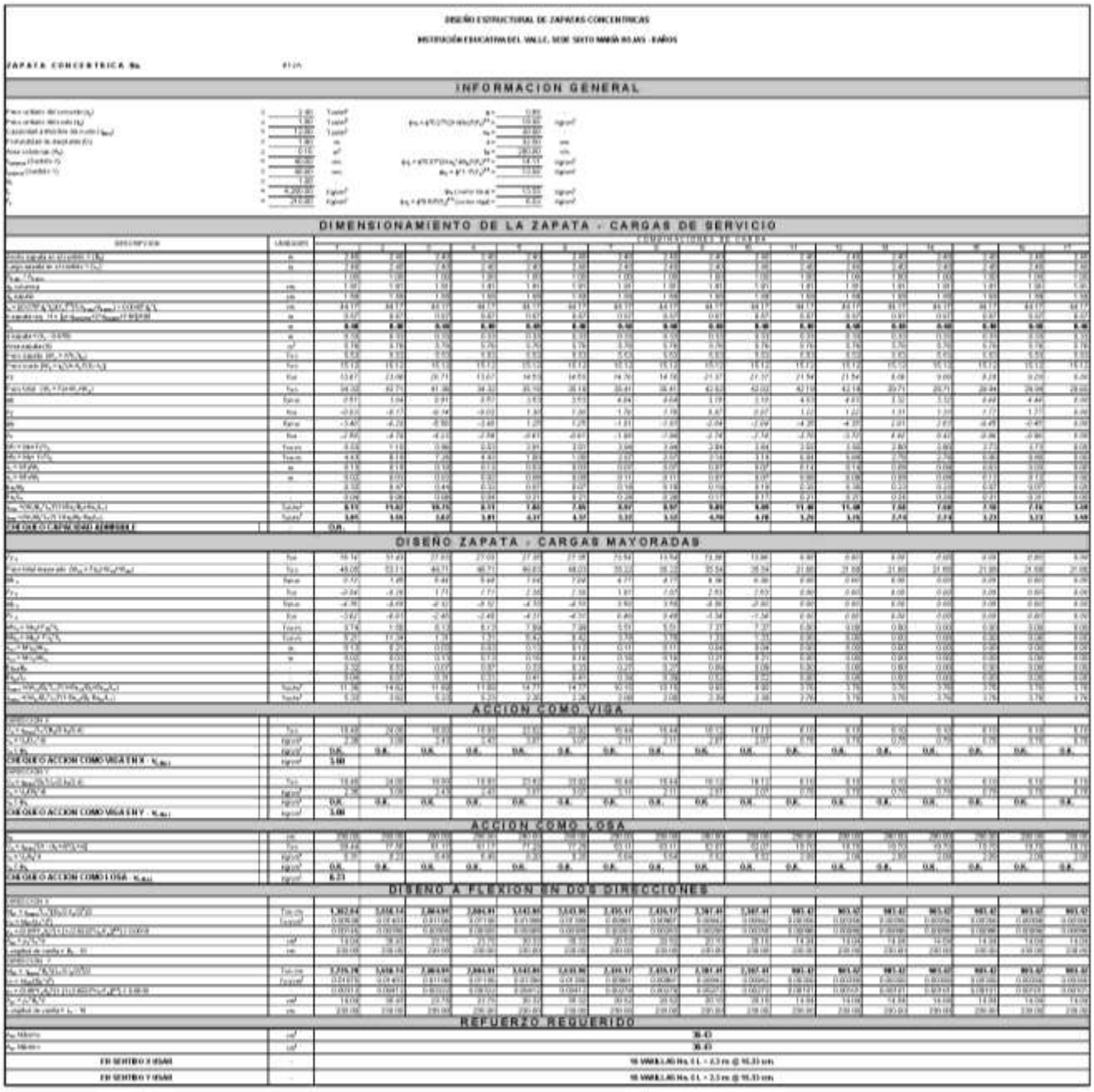
DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

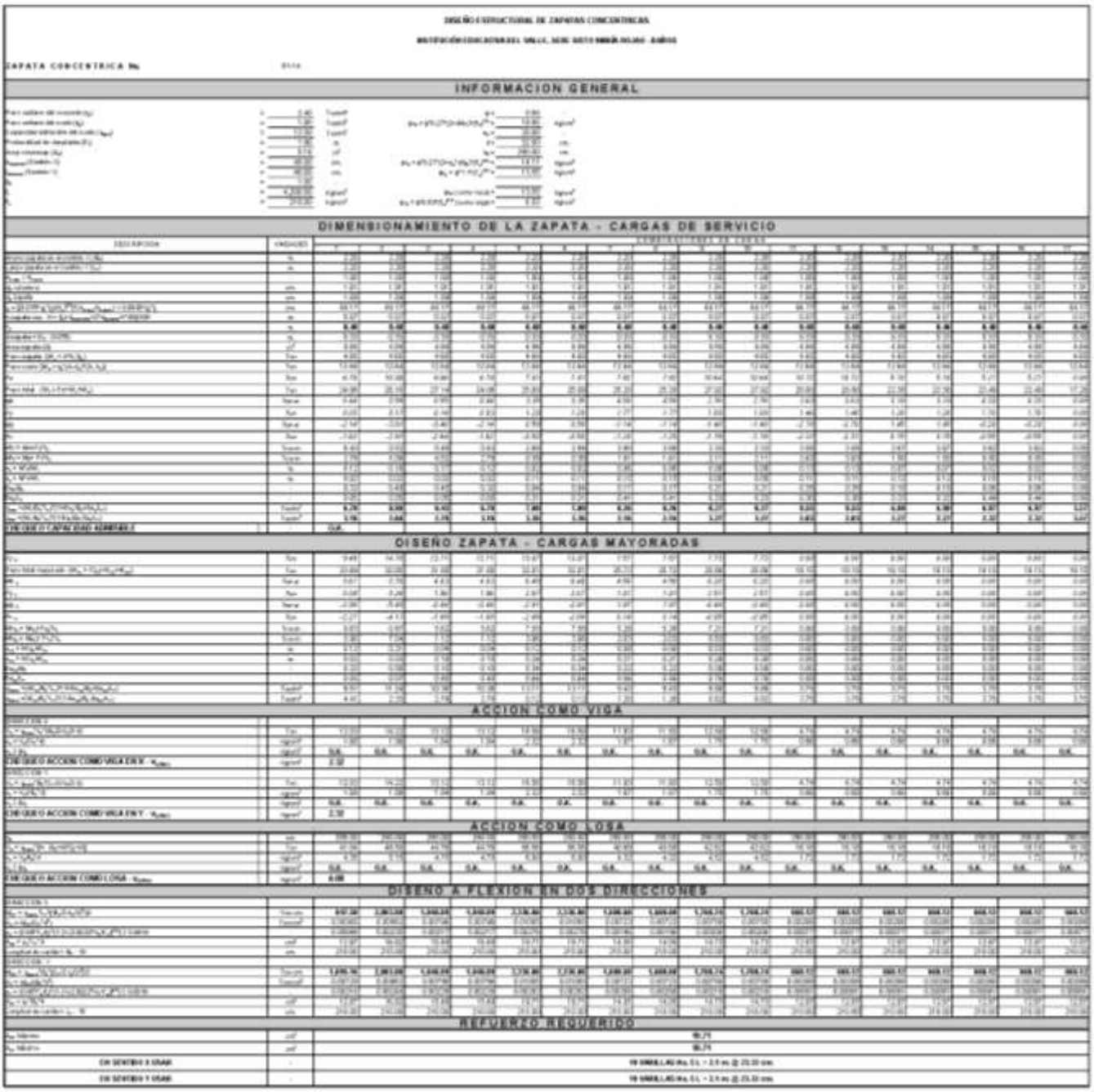
DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



7.4 DISEÑO DE VIGAS

VB-101/CUBIERTA

B=0.20 H=0.45 L=3.20			B=0.20 H=0.45 L=3.20		
Mu=-14.74 As=3.96 As(r)=2.61		Mu=-14.74 As=3.96 As(r)=2.61	Mu=-14.74 As=3.96 As(r)=2.61		Mu=-14.74 As=3.96 As(r)=2.61
	Mu=47.03 As=3.70 As(r)=3.74			Mu=47.03 As=3.70 As(r)=3.74	
Vu=-40.71	Vu=-19.45	Vu=2.79	Vu=-2.79	Vu=19.45	Vu=40.71

VB-102/CUBIERTA

B=0.30 H=0.45 L=6.60		
Mu=-184.27 As=12.83 As(r)=14.35		Mu=-184.27 As=12.83 As(r)=14.35
	Mu=213.99 As=18.79 As(r)=17.24	
Vu=-156.71	Vu=-70.87	Vu=156.71

VB-103/CUBIERTA

B=0.30 H=0.45 L=6.60		
Mu=-108.64 As=8.55 As(r)=7.87		Mu=-108.64 As=8.55 As(r)=7.87
	Mu=126.63 As=10.55 As(r)=9.30	
Vu=-93.36	Vu=-40.97	Vu=93.36

VB-104/CUBIERTA

B=0.30 H=0.45 L=4.96			B=0.30 H=0.45 L=1.90		
Mu=-28.40 As=5.94 As(r)=3.92		Mu=-103.11 As=8.55 As(r)=7.44	Mu=-110.64 As=8.55 As(r)=8.03		Mu=-0.00 As=5.94 As(r)=3.92
	Mu=38.34 As=5.94 As(r)=3.92			Mu=0.00 As=5.94 As(r)=3.92	
Vu=-36.20	Vu=23.28	Vu=67.53	Vu=-64.59	Vu=-52.65	Vu=-40.71

VB-105/CUBIERTA

B=0.30 H=0.45 L=5.10			B=0.30 H=0.45 L=2.05		
Mu=-33.25 As =5.94 As(r)=3.92		Mu=-78.83 As =5.94 As(r)=5.57	Mu=-61.43 As =5.94 As(r)=4.29		Mu=-10.38 As =5.94 As(r)=3.92
	Mu=94.49 As =8.45 As(r)=6.77			Mu=0.00 As =5.94 As(r)=3.92	
Vu=-81.93	Vu=8.71	Vu=98.94	Vu=-42.81	Vu=-23.21	Vu=-4.22

VB-106/CUBIERTA

B=0.30 H=0.45 L=4.96			B=0.30 H=0.45 L=1.90		
Mu=-28.40 As =5.94 As(r)=3.92		Mu=-103.11 As =8.24 As(r)=7.44	Mu=-110.64 As =8.70 As(r)=8.03		Mu=-0.00 As =5.94 As(r)=3.92
	Mu=38.34 As =5.94 As(r)=3.92			Mu=0.00 As =5.94 As(r)=3.92	
Vu=-36.20	Vu=23.28	Vu=67.53	Vu=-64.59	Vu=-52.65	Vu=-40.71

Columnas A1-1A, B1-1A

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
CUBIERTA					97.50	43.71				16/#5 (2.0%)	0.67	1.80	1.40
	3.55	.45	.40	.40			-105.60	58.12	25.73				
		1.00			-68.68	-20.23				16/#5 (2.0%)	0.42		

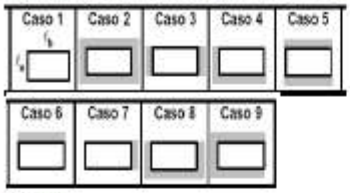
Columnas A1-2A, B1-2A

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
CUBIERTA					178.32	26.36				16/#5 #6 (2.4%)	0.89	1.86	1.77
	3.55	.45	.40	.40			-240.18	97.90	26.36				
		1.00			115.39	-16.06				16/#5 #6 (2.4%)	0.58		

7.5 DISEÑO DE ELEMENTOS COMPLEMENTARIOS

PROYECTO: INSTITUCION EDUCATIVA SIXTO MARIA-BAÑOS
DISEÑO PLACA MACIZA TIPO (EN DOS DIRECCIONES)

El diseño de la placa maciza se realiza de acuerdo con lo establecido en C.13.9 de las NSR - 10



Geometría de la losa

la =	3.25	m	fy =	420	MPa
lb =	5.10	m	f'c =	21.1	MPa

Relación m = **0.637**

Espesor escogido: **0.12** **m**

Cargas

Peso propio de la losa	0.12x1.0x24	2.88	kN/m²
Impermeabilización	0.05x20	1.00	kN/m²
Carga Muerta adicional		0.50	kN/m²
Carga Muerta Total		4.38	kN/m²
Carga Viva		5.00	kN/m²
Carga Última		13.26	kN/m²

Tipo de soporte CASO Nº 2

DISEÑO A MOMENTO FLECTOR

Coeficientes para momento positivo por carga muerta y viva:

C_{aD} =	0.045						
C_{bD} =	0.029						
C_{aV} =	0.045						
C_{bV} =	0.029						
Mu_a =	**4.46**	kN.m	*Cuantía:*	0.0019	*As =*	2.16 cm²/m	
Mu_b =	**7.08**	kN.m	*Cuantía:*	0.0019	*As =*	2.29 cm²/m	

Coeficientes para momento negativo por carga última:

C_a =	0.055	Mu_a =	**7.70**	kN.m	*Cuantía:*	0.0021	*As =*	2.50 cm²/m
C_b =	0.037	Mu_b =	**12.76**	kN.m	*Cuantía:*	0.0035	*As =*	4.21 cm²/m

Distribución de refuerzo:
Colocar malla electrosoldada diametro 6mm c/.15 longitudinalmente, en sentido a (Arriba)
Colocar malla electrosoldada diametro 6mm c/.15 longitudinalmente, sentido b (Abajo)

REVISIÓN A CORTANTE

Coeficientes de relación de carga en las dos direcciones para cortante:

W_a =	0.60		
W_b =	0.40		
ϕvC =	**0.574**	**MPa**	
ϕvu_a =	**0.169**	**MPa**	**OK**
ϕvu_b =	**0.072**	**MPa**	**OK**

7.6 DISEÑO DE ELENTOS NO ESTRUCTURALES

PROYECTO: INSTITUCIÓN EDUCATIVA SIXTO MARIA-BAÑOS
DISEÑO DE ELEMENTOS NO ESTRUCTURALES

Units: kN*m

STORY DATA

Story	Height	Elevation	SimilarTo
CUBIERTA	4.00	4.00	None
BASE	0.00	0.00	None

CENTER MASS RIGIDITY

Story	Diaphragm	MassX	MassY	XCM	YCM	CumMassX	CumMassY
CUBIERTA	D1	37.0436	37.0436	3.5	3.708	37.0436	37.0436

XCCM	YCCM	XCR	YCR
3.5	3.708	3.5	2.767

STORY SHEARS

Story	Load	Loc	P	VX	VY	T	MX	MY
CUBIERTA	SISDERX	Top	0	402.78	0	2354.941	0	0
CUBIERTA	SISDERX	Bottom	0	402.78	0	2354.941	0	1611.134

$$F_p = \frac{a_x a_p}{R_p} g M_p \geq \frac{A_a I}{2} g M_p \qquad a_x = \frac{C_{vx} V_s}{m_x g} \leq 2.5 A_a \qquad C_{vx} = \frac{m_x h_x^k}{\sum_{i=1}^{n} (m_i h_i^k)}$$

$$V_s = S_a g M$$

g: 9.81 m/s^2
Sa: 0.984 s

III	SUPERIOR
II	BUENO
I	BAJO

Grado de desempeño de los elementos no estructurales: SUPERIOR

ANALISIS DE CARGAS PARA MUROS

Espesor de muros:	0.15	m
Espesor de pañete en una cara:	0	m
Densidad de mamposteria:	13	kN/m3
Densidad mortero de pañete:	21	kN/m3
Altura Fachada:	4.00	m
Carga	7.8	kN/m
Descripción:	mamposteria reforzada, separada lateralmente de la estructura, apoyada arriba y abajo	
ap:	1.0	
Rp:	6	

ANALISIS DE CARGAS PARA ANTEPECHOS

Espesor de muros:	0.15	m
Espesor de pañete en una cara:	0	m
Densidad de mamposteria:	13	kN/m3
Densidad mortero de pañete:	21	kN/m3
Altura Antepecho:	1	m
Carga	1.95	kN/m
Descripción:	mamposteria reforzada, separada lateralmente de la estructura, apoyada solo abajo	
ap:	2.5	
Rp:	6	

Sección de vigas verticales:	0.15x0.25	m
f'c =	21.1	MPa
fy =	420	MPa

DISEÑO PARA MUROS

Story	Fx	Wx	ax	ap	Rp	Fp	M	V
CUBIERTA	402.78	37.04	1.968	1.0	6	2.558	5.117	5.117

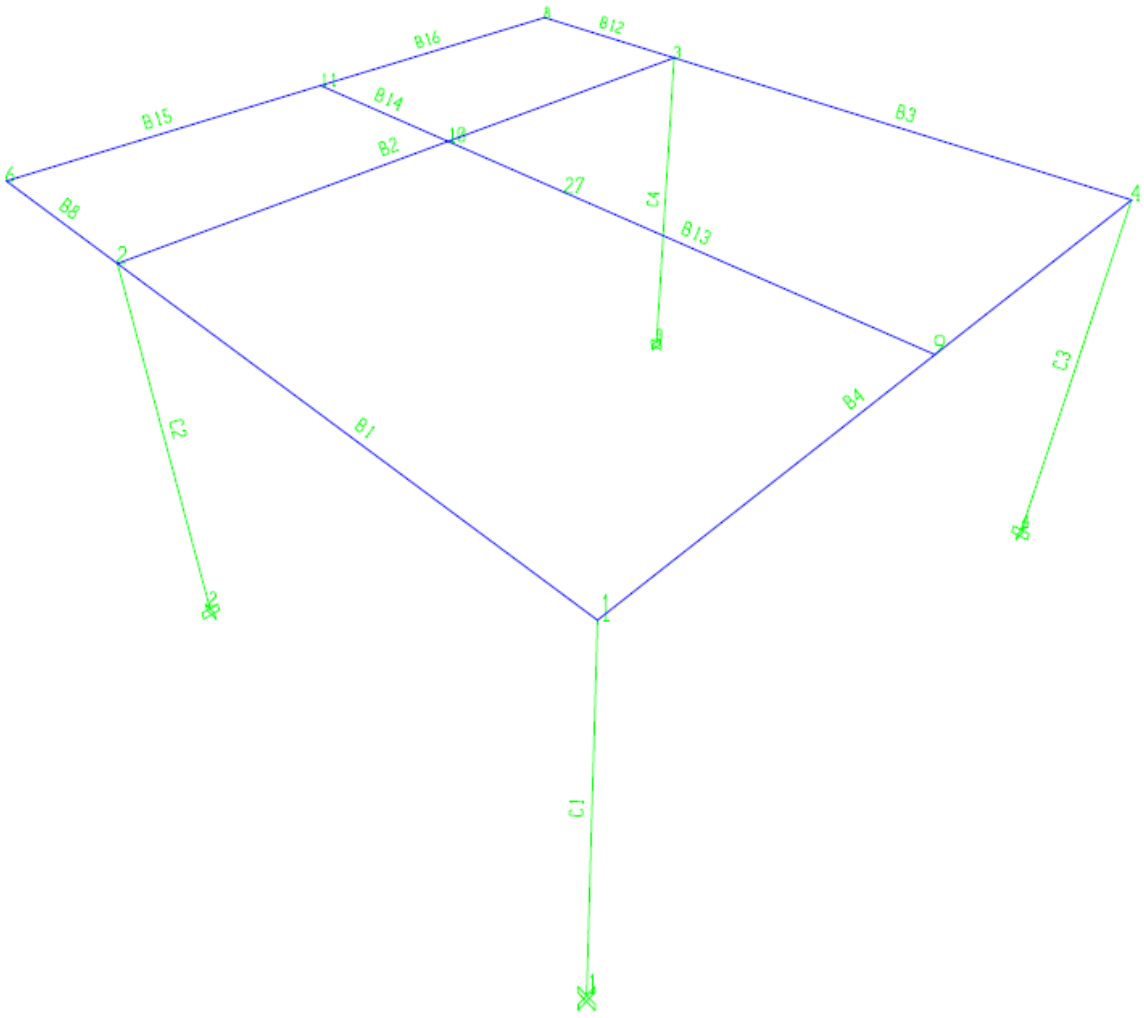
	Sección Vigas V.			As. (cm2)		Separación column.		Fl. 1/4"
Story	b	d	ρ	necesa.	ubicado	S max	S escogida	S estribos
CUBIERTA	0.15	0.21	0.00188	0.59	0.71	1.20	1.20	0.188

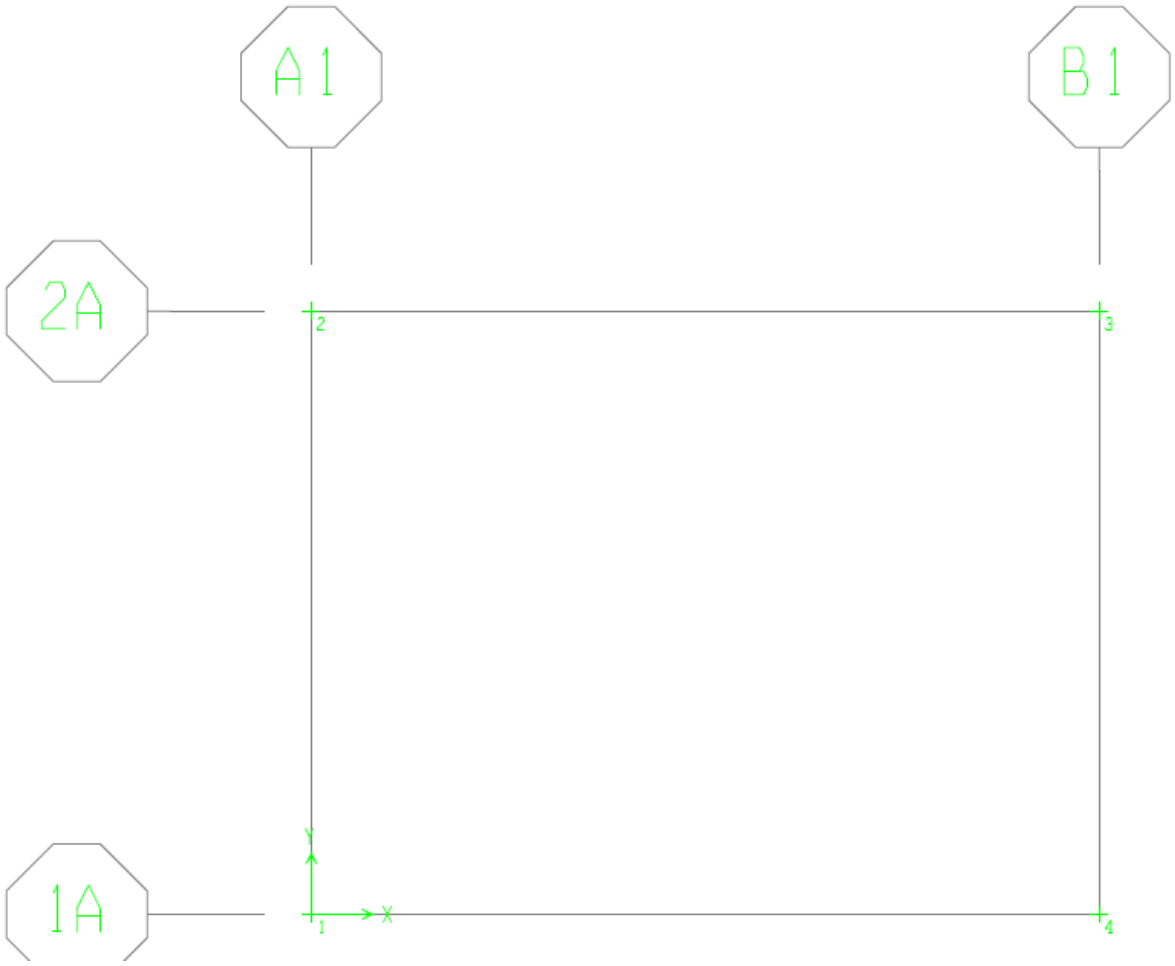
DISEÑO PARA ANTEPECHOS

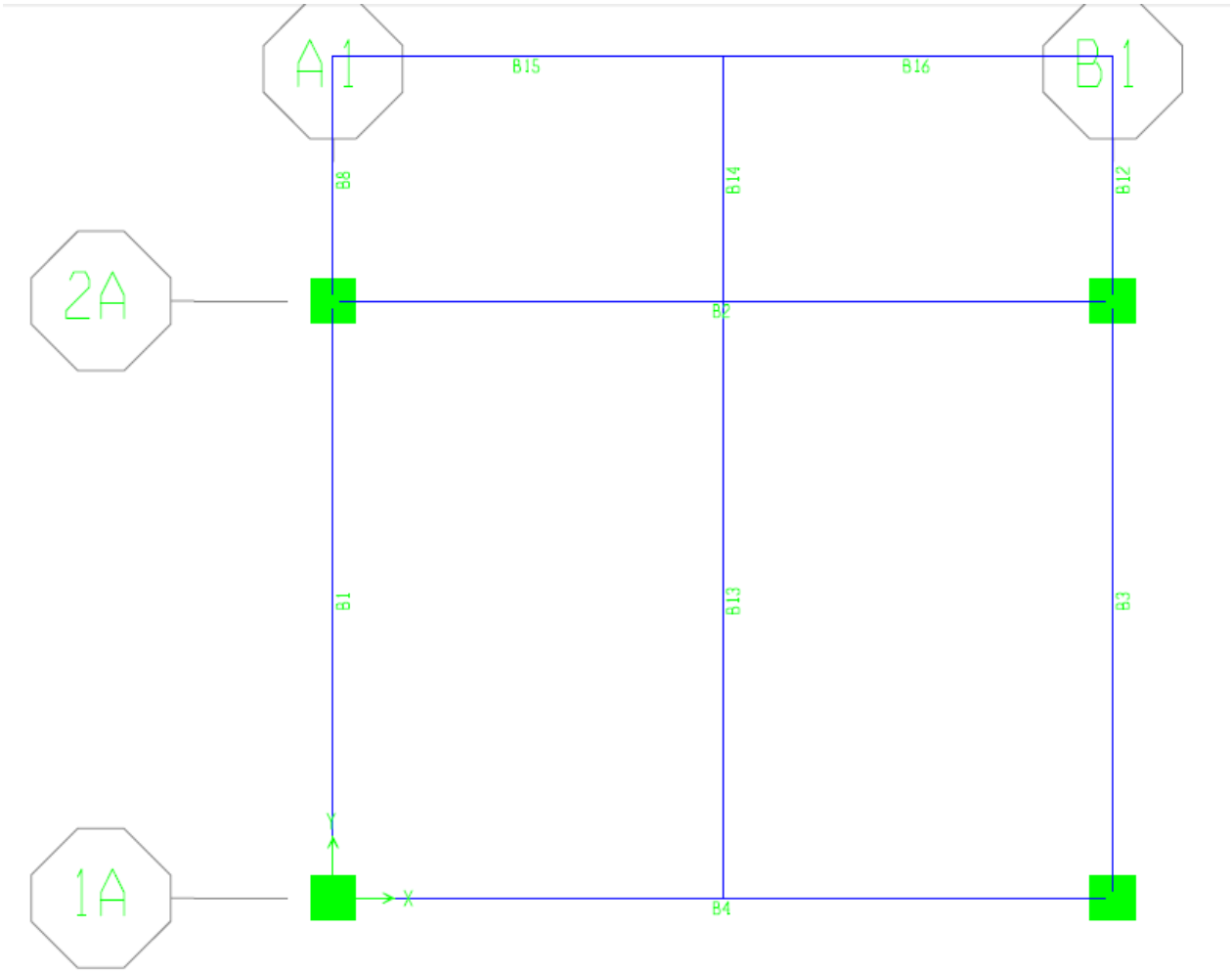
Story	Fx	Wx	ax	ap	Rp	Fp	M	V
CUBIERTA	402.78	37.04	1.968	2.5	6	6.396	12.792	12.792

	Sección columneta			As. (cm2)		Separación column.		Fl. 1/4"
Story	b	d	ρ	necesa.	ubicado	S max	S escogida	S estribos
CUBIERTA	0.15	0.21	0.00488	1.54	1.29	0.84	0.80	0.188

7.7 ANEXOS DE COMPUTADOR




A1
B1
2A
1A
2
3
1
4
Y
X


A 1
B 1
2A
1A
B15
B16
B8
B14
B12
B2
B1
B13
B3
B4
Y
X

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S T O R Y D A T A

STORY	SIMILAR TO	HEIGHT	ELEVATION
CUBIERTA	None	4.000	4.000
BASE	None		0.000

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P O I N T C O O R D I N A T E S

POINT	X	Y	DZ-BELOW
1	0.000	0.000	0.000
2	0.000	5.360	0.000
3	7.000	5.360	0.000
4	7.000	0.000	0.000
6	0.000	7.560	0.000
8	7.000	7.560	0.000
9	3.500	0.000	0.000
10	3.500	5.360	0.000
11	3.500	7.560	0.000

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C O L U M N C O N N E C T I V I T Y D A T A

COLUMN	I END PT	J END PT	I END STORY
C1	1	1	Below
C2	2	2	Below
C3	4	4	Below
C4	3	3	Below

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B E A M C O N N E C T I V I T Y D A T A

BEAM	I END PT	J END PT
B1	1	2
B2	2	3
B3	4	3
B4	1	4
B8	2	6
B12	3	8
B13	9	10
B14	10	11
B15	6	11
B16	11	8

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R I G I D D I A P H R A G M P O I N T C O N N E C T I V I T Y D A T A

STORY	DIAPHRAGM	POINT	POINT	POINT	POINT	POINT
CUBIERTA	D1	1	2	3	4	6
		8	9	10	11	

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

MATERIAL NAME	MATERIAL TYPE	DESIGN TYPE	MATERIAL DIR/PLANE	MODULUS OF ELASTICITY	POISSON'S RATIO	THERMAL COEFF	SHEAR MODULUS
STEEL	Iso	Steel	All	199900000.00	0.3000	1.1700E-05	76884615.38
CONC21	Iso	Concrete	All	21538110.000	0.2000	9.9000E-06	8974212.500
OTHER	Iso	None	All	199947978.80	0.3000	1.1700E-05	76903068.77
A500	Iso	Steel	All	199900000.00	0.3000	1.1700E-05	76884615.38

STEEL	7.8271E+00	7.6820E+01
CONC21	2.4000E+00	2.4000E+01
OTHER	7.8271E+00	7.6820E+01
A500	7.8271E+00	7.6820E+01

M A T E R I A L D E S I G N D A T A F O R S T E E L M A T E R I A L S

MATERIAL NAME	STEEL FY	STEEL FU	STEEL COST ($)
STEEL	344737.890	448159.260	271447.16
A500	352000.000	400000.000	5000.00

M A T E R I A L D E S I G N D A T A F O R C O N C R E T E M A T E R I A L S

MATERIAL NAME	LIGHTWEIGHT CONCRETE	CONCRETE FC	REBAR FY	REBAR FYS	LIGHTWT REDUC FACT
CONC21	No	21000.000	420000.000	420000.000	N/A

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F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	MATERIAL NAME	SECTION SHAPE NAME OR NAME IN SECTION DATABASE FILE	CONC COL	CONC BEAM
VIG50X45	CONC21	Rectangular		Yes
COL.40X40	CONC21	Rectangular	Yes	
TUBO305X100	A500	Box/Tube		
VIG20X45	CONC21	Rectangular		Yes
VIG30X45	CONC21	Rectangular		Yes

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	SECTION DEPTH	FLANGE WIDTH TOP	FLANGE THICK TOP	WEB THICK	FLANGE WIDTH BOT	FLANGE THICK BOT
VIG50X45	0.4500	0.5000	0.0000	0.0000	0.0000	0.0000
COL.40X40	0.4000	0.4000	0.0000	0.0000	0.0000	0.0000
TUBO305X100	0.3050	0.1000	0.0064	0.0064	0.0000	0.0000
VIG20X45	0.4500	0.2000	0.0000	0.0000	0.0000	0.0000
VIG30X45	0.4500	0.3000	0.0000	0.0000	0.0000	0.0000

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	SECTION AREA	TORSIONAL CONSTANT	MOMENTS OF INERTIA I33	MOMENTS OF INERTIA I22	SHEAR AREAS A2	SHEAR AREAS A3
VIG50X45	0.2250	0.0070	0.0038	0.0047	0.1875	0.1875
COL.40X40	0.1600	0.0036	0.0021	0.0021	0.1333	0.1333
TUBO305X100	0.0050	0.0000	0.0001	0.0000	0.0039	0.0013
VIG20X45	0.0900	0.0009	0.0015	0.0003	0.0750	0.0750
VIG30X45	0.1350	0.0024	0.0023	0.0010	0.1125	0.1125

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	SECTION MODULI S33	SECTION MODULI S22	PLASTIC MODULI Z33	PLASTIC MODULI Z22	RADIUS OF GYRATION R33	RADIUS OF GYRATION R22
VIG50X45	0.0169	0.0188	0.0253	0.0281	0.1299	0.1443
COL.40X40	0.0107	0.0107	0.0160	0.0160	0.1155	0.1155
TUBO305X100	0.0004	0.0002	0.0005	0.0002	0.1048	0.0430
VIG20X45	0.0068	0.0030	0.0101	0.0045	0.1299	0.0577
VIG30X45	0.0101	0.0068	0.0152	0.0101	0.1299	0.0866

F R A M E S E C T I O N W E I G H T S A N D M A S S E S

FRAME SECTION NAME	TOTAL WEIGHT	TOTAL MASS

VIG30X45	118.8432	11.8843

C O N C R E T E C O L U M N D A T A

FRAME SECTION NAME	REINF CONFIGURATION LONGIT	LATERAL	REINF SIZE/TYPE	NUM BARS 3DIR/2DIR	NUM BARS CIRCULAR	BAR COVER
COL.40X40	Rectangular	Ties	#8/Design	4/4	N/A	0.0500

C O N C R E T E B E A M D A T A

FRAME SECTION NAME	TOP COVER	BOT COVER	TOP LEFT AREA	TOP RIGHT AREA	BOT LEFT AREA	BOT RIGHT AREA
VIG50X45	0.0500	0.0500	0.000	0.000	0.000	0.000
VIG20X45	0.0500	0.0500	0.000	0.000	0.000	0.000
VIG30X45	0.0500	0.0500	0.000	0.000	0.000	0.000

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S H E L L S E C T I O N P R O P E R T Y D A T A

SHELL SECTION	MATERIAL NAME	SHELL TYPE	LOAD DIST ONE WAY	MEMBRANE THICK	BENDING THICK	TOTAL WEIGHT	TOTAL MASS
MACIZA	CONC21	Membrane	No	0.1620	0.1620	205.7530	20.5753
LIVIANA	CONC21	Membrane	No	0.0170	0.0170	0.0000	0.0000

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S T A T I C L O A D C A S E S

STATIC CASE	CASE TYPE	AUTO LAT LOAD	SELF WT MULTIPLIER	NOTIONAL FACTOR	NOTIONAL DIRECTION
DEAD	DEAD	N/A	1.0000		
LIVE	LIVE	N/A	0.0000		

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R E S P O N S E S P E C T R U M C A S E S

RESP SPEC CASE: SISDISX

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	DISENO	11.2300
U2	----	N/A
U3	----	N/A

RESP SPEC CASE: SISDISY

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

RESP SPEC CASE: SISDERX

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	DERIVAS	11.2000
U2	----	N/A
U3	----	N/A

RESP SPEC CASE: SISDERY

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	DERIVAS	9.8300
U3	----	N/A

RESP SPEC CASE: SISUMRX

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	UMBRAL	21.6700
U2	----	N/A
U3	----	N/A

RESP SPEC CASE: SISUMRY

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	UMBRAL	19.3000
U3	----	N/A

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COMBO	COMBO TYPE	CASE	CASE TYPE	SCALE FACTOR
COMDIS1	ADD	DEAD	Static	1.4000
COMDIS2	ADD	DEAD	Static	1.2000
		LIVE	Static	1.6000
COMDIS3	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISDISX	Spectra	1.0000
		SISDISY	Spectra	0.3000
COMDIS4	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISDISY	Spectra	1.0000
		SISDISX	Spectra	0.3000
COMDIS5	ADD	DEAD	Static	0.9000
		SISDISX	Spectra	1.0000
		SISDISY	Spectra	0.3000
COMDIS6	ADD	DEAD	Static	0.9000
		SISDISY	Spectra	1.0000
		SISDISX	Spectra	0.3000
ENVOLVENTE	ENVE	COMDIS1	Combo	1.0000
		COMDIS2	Combo	1.0000
		COMDIS3	Combo	1.0000
		COMDIS4	Combo	1.0000
		COMDIS5	Combo	1.0000
		COMDIS6	Combo	1.0000
CIM1	ADD	DEAD	Static	1.0000
		LIVE	Static	1.0000
CIM2	ADD	DEAD	Static	1.0000
		LIVE	Static	0.7500
		SISDISX	Spectra	0.1400
		SISDISY	Spectra	0.0466
CIM3	ADD	DEAD	Static	1.0000
		LIVE	Static	0.7500
		SISDISY	Spectra	0.1400
		SISDISX	Spectra	0.0466
COMDER1	ADD	SISDERX	Spectra	1.0000
		SISDERY	Spectra	0.3000
COMDER2	ADD	SISDERY	Spectra	1.0000
		SISDERX	Spectra	0.3000
COMDERUM1	ADD	SISUMBX	Spectra	1.0000
		SISUMBY	Spectra	0.3000
COMDERUM2	ADD	SISUMBY	Spectra	1.0000
		SISUMBX	Spectra	0.3000
SISMOX2	ADD	SISDISX	Spectra	-1.0000
SISMOY2	ADD	SISDISY	Spectra	-1.0000

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R E S P O N S E S P E C T R U M F U N C T I O N - F R O M F I L E

FUNCTION NAME: DERIVAS

FILE NAME: c:\users\diseños y estructura\desktop\ing. daniel rojas\dye16-2282-1.e sixto maria\baño\memorias\derivas.txt
DATA TYPE: Period vs Acceleration
NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	1.1330
0.0500	1.1330
0.1000	1.1330
0.1600	1.1330
0.2100	1.1330
0.4000	1.1330
0.6000	1.1330
0.8000	1.1330
0.9900	1.1330
1.3400	0.8410
1.6800	0.6690
2.0300	0.5550
2.3700	0.4740
2.7200	0.4140
3.0600	0.3670

4.7900	0.2350
5.1300	0.2190
5.4800	0.2050
5.8200	0.1930
6.1700	0.1820
6.5100	0.1730
6.8600	0.1640
7.2000	0.1560
8.2000	0.1200
9.2000	0.0960

FUNCTION NAME: DISENO

FILE NAME: c:\users\diseños y estructura\desktop\ing. daniel rojas\dye16-2282-1.e sixto maria\baño\memorias\diseño.txt
DATA TYPE: Period vs Acceleration
NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	0.2160
0.0500	0.2160
0.1000	0.2160
0.1600	0.2160
0.2100	0.2160
0.4000	0.2160
0.6000	0.2160
0.8000	0.2160
0.9900	0.2160
1.3400	0.1600
1.6800	0.1270
2.0300	0.1060
2.3700	0.0900
2.7200	0.0790
3.0600	0.0700
3.4100	0.0630
3.7500	0.0570
4.1000	0.0520
4.4400	0.0480
4.7900	0.0450
5.1300	0.0420
5.4800	0.0390
5.8200	0.0370
6.1700	0.0350
6.5100	0.0330
6.8600	0.0310
7.2000	0.0300
8.2000	0.0230
9.2000	0.0180

FUNCTION NAME: UMBRAL

FILE NAME: c:\users\diseños y estructura\desktop\ing. daniel rojas\dye16-2282-1.e sixto maria\baño\memorias\umbral.txt
DATA TYPE: Period vs Acceleration
NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	0.2700
0.0500	0.3780
0.1000	0.4860
0.1500	0.5940
0.2000	0.7020
0.2500	0.8100
0.4500	0.8100
0.6500	0.8100
0.8600	0.8100
1.0600	0.8100
1.2600	0.8100
1.4600	0.8100
1.6700	0.8100

4.9500	0.3060
5.5700	0.2720
6.1800	0.2450
6.8000	0.2230
7.4200	0.2040
8.0300	0.1880
8.6500	0.1750
9.2700	0.1630
9.8800	0.1530
10.5000	0.1230
11.5000	0.1030
12.5000	0.0870

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F R A M E S E C T I O N A S S I G N M E N T S T O L I N E O B J E C T S

STORY LEVEL	LINE ID	LINE TYPE	SECTION TYPE	AUTO SELECT SECTION	ANALYSIS SECTION	DESIGN PROCEDURE	DESIGN SECTION
CUBIERTA	C1	Column	Rectangular	None	COL.40X40	Conc Frame	COL.40X40
CUBIERTA	C2	Column	Rectangular	None	COL.40X40	Conc Frame	COL.40X40
CUBIERTA	C3	Column	Rectangular	None	COL.40X40	Conc Frame	COL.40X40
CUBIERTA	C4	Column	Rectangular	None	COL.40X40	Conc Frame	COL.40X40
CUBIERTA	B1	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
CUBIERTA	B2	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
CUBIERTA	B3	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
CUBIERTA	B4	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
CUBIERTA	B8	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
CUBIERTA	B12	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
CUBIERTA	B13	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
CUBIERTA	B14	Beam	Rectangular	None	VIG30X45	Conc Frame	VIG30X45
CUBIERTA	B15	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45
CUBIERTA	B16	Beam	Rectangular	None	VIG20X45	Conc Frame	VIG20X45

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U N I F O R M L O A D A S S I G N M E N T S T O A R E A O B J E C T S

CASE	STORY	AREA	AREATYPE	DIRECTION	LOAD
LIVE	CUBIERTA	F1	Floor	Gravity	5.0000
LIVE	CUBIERTA	F2	Floor	Gravity	5.0000
LIVE	CUBIERTA	F3	Floor	Gravity	5.0000
LIVE	CUBIERTA	F4	Floor	Gravity	5.0000

7.7.1 FUERZAS EN VIGAS

BEAM FORCES
UNID: kN-m

Story	Beam	Load	Loc	P	V2	V3	T	M2	M3
CUBIERTA	B1	ENVOLVENTE MAX	0	0	1.68	0	6.635	0	36.679
CUBIERTA	B1	ENVOLVENTE MAX	0.536	0	3.75	0	6.635	0	41.76
CUBIERTA	B1	ENVOLVENTE MAX	1.072	0	6.82	0	6.635	0	45.063
CUBIERTA	B1	ENVOLVENTE MAX	1.608	0	10.89	0	6.635	0	44.271
CUBIERTA	B1	ENVOLVENTE MAX	2.144	0	17.27	0	6.635	0	38.207
CUBIERTA	B1	ENVOLVENTE MAX	2.68	0	28.42	0	6.635	0	32.156
CUBIERTA	B1	ENVOLVENTE MAX	3.216	0	39.57	0	6.635	0	21.243
CUBIERTA	B1	ENVOLVENTE MAX	3.752	0	50.63	0	6.635	0	11.87
CUBIERTA	B1	ENVOLVENTE MAX	4.288	0	59.65	0	6.635	0	8.972
CUBIERTA	B1	ENVOLVENTE MAX	4.824	0	65.9	0	6.635	0	4.159
CUBIERTA	B1	ENVOLVENTE MAX	5.36	0	69.38	0	6.635	0	-2.031
CUBIERTA	B1	ENVOLVENTE MIN	0	0	-39.45	0	0.042	0	-37.008
CUBIERTA	B1	ENVOLVENTE MIN	0.536	0	-35.97	0	0.042	0	-23.161
CUBIERTA	B1	ENVOLVENTE MIN	1.072	0	-29.73	0	0.042	0	-11.519
CUBIERTA	B1	ENVOLVENTE MIN	1.608	0	-20.7	0	0.042	0	-1.791
CUBIERTA	B1	ENVOLVENTE MIN	2.144	0	-11.22	0	0.042	0	5.517
CUBIERTA	B1	ENVOLVENTE MIN	2.68	0	-6.37	0	0.042	0	9.985
CUBIERTA	B1	ENVOLVENTE MIN	3.216	0	-1.53	0	0.042	0	-1.37
CUBIERTA	B1	ENVOLVENTE MIN	3.752	0	3.28	0	0.042	0	-16.671
CUBIERTA	B1	ENVOLVENTE MIN	4.288	0	7.36	0	0.042	0	-46.35
CUBIERTA	B1	ENVOLVENTE MIN	4.824	0	10.43	0	0.042	0	-80.123
CUBIERTA	B1	ENVOLVENTE MIN	5.36	0	12.5	0	0.042	0	-116.502
CUBIERTA	B2	ENVOLVENTE MAX	0	0	-43.64	0	9.45	0	-23.856
CUBIERTA	B2	ENVOLVENTE MAX	0.7	0	-39.88	0	9.45	0	5.578
CUBIERTA	B2	ENVOLVENTE MAX	1.4	0	-32.86	0	9.45	0	44.631
CUBIERTA	B2	ENVOLVENTE MAX	2.1	0	-24.26	0	9.45	0	108.542
CUBIERTA	B2	ENVOLVENTE MAX	2.8	0	-17.24	0	9.45	0	170.382
CUBIERTA	B2	ENVOLVENTE MAX	3.5	0	-13.48	0	9.45	0	221.685
CUBIERTA	B2	ENVOLVENTE MAX	3.5	0	69.86	0	-0.256	0	221.685
CUBIERTA	B2	ENVOLVENTE MAX	4.2	0	78.79	0	-0.256	0	170.382
CUBIERTA	B2	ENVOLVENTE MAX	4.9	0	99.56	0	-0.256	0	108.542
CUBIERTA	B2	ENVOLVENTE MAX	5.6	0	126	0	-0.256	0	44.631
CUBIERTA	B2	ENVOLVENTE MAX	6.3	0	146.77	0	-0.256	0	5.578
CUBIERTA	B2	ENVOLVENTE MAX	7	0	155.69	0	-0.256	0	-23.856
CUBIERTA	B2	ENVOLVENTE MIN	0	0	-155.69	0	0.256	0	-174.992
CUBIERTA	B2	ENVOLVENTE MIN	0.7	0	-146.77	0	0.256	0	-82
CUBIERTA	B2	ENVOLVENTE MIN	1.4	0	-126	0	0.256	0	-10.931
CUBIERTA	B2	ENVOLVENTE MIN	2.1	0	-99.56	0	0.256	0	23.85
CUBIERTA	B2	ENVOLVENTE MIN	2.8	0	-78.79	0	0.256	0	52.912
CUBIERTA	B2	ENVOLVENTE MIN	3.5	0	-69.86	0	0.256	0	73.953
CUBIERTA	B2	ENVOLVENTE MIN	3.5	0	13.48	0	-9.45	0	73.953
CUBIERTA	B2	ENVOLVENTE MIN	4.2	0	17.24	0	-9.45	0	52.912
CUBIERTA	B2	ENVOLVENTE MIN	4.9	0	24.26	0	-9.45	0	23.85
CUBIERTA	B2	ENVOLVENTE MIN	5.6	0	32.86	0	-9.45	0	-10.931
CUBIERTA	B2	ENVOLVENTE MIN	6.3	0	39.88	0	-9.45	0	-82
CUBIERTA	B2	ENVOLVENTE MIN	7	0	43.64	0	-9.45	0	-174.992
CUBIERTA	B3	ENVOLVENTE MAX	0	0	1.68	0	-0.042	0	36.679
CUBIERTA	B3	ENVOLVENTE MAX	0.536	0	3.75	0	-0.042	0	41.76
CUBIERTA	B3	ENVOLVENTE MAX	1.072	0	6.82	0	-0.042	0	45.063
CUBIERTA	B3	ENVOLVENTE MAX	1.608	0	10.89	0	-0.042	0	44.271
CUBIERTA	B3	ENVOLVENTE MAX	2.144	0	17.27	0	-0.042	0	38.207
CUBIERTA	B3	ENVOLVENTE MAX	2.68	0	28.42	0	-0.042	0	32.156
CUBIERTA	B3	ENVOLVENTE MAX	3.216	0	39.57	0	-0.042	0	21.243
CUBIERTA	B3	ENVOLVENTE MAX	3.752	0	50.63	0	-0.042	0	11.87
CUBIERTA	B3	ENVOLVENTE MAX	4.288	0	59.65	0	-0.042	0	8.972
CUBIERTA	B3	ENVOLVENTE MAX	4.824	0	65.9	0	-0.042	0	4.159
CUBIERTA	B3	ENVOLVENTE MAX	5.36	0	69.38	0	-0.042	0	-2.031
CUBIERTA	B3	ENVOLVENTE MIN	0	0	-39.45	0	-6.635	0	-37.008
CUBIERTA	B3	ENVOLVENTE MIN	0.536	0	-35.97	0	-6.635	0	-23.161
CUBIERTA	B3	ENVOLVENTE MIN	1.072	0	-29.73	0	-6.635	0	-11.519
CUBIERTA	B3	ENVOLVENTE MIN	1.608	0	-20.7	0	-6.635	0	-1.791
CUBIERTA	B3	ENVOLVENTE MIN	2.144	0	-11.22	0	-6.635	0	5.517
CUBIERTA	B3	ENVOLVENTE MIN	2.68	0	-6.37	0	-6.635	0	9.985
CUBIERTA	B3	ENVOLVENTE MIN	3.216	0	-1.53	0	-6.635	0	-1.37
CUBIERTA	B3	ENVOLVENTE MIN	3.752	0	3.28	0	-6.635	0	-16.671
CUBIERTA	B3	ENVOLVENTE MIN	4.288	0	7.36	0	-6.635	0	-46.35
CUBIERTA	B3	ENVOLVENTE MIN	4.824	0	10.43	0	-6.635	0	-80.123

CUBIERTA	B3	ENVOLVENTE MIN	5.36	0	12.5	0	-6.635	0	-116.502
CUBIERTA	B4	ENVOLVENTE MAX	0	0	-26.98	0	-1.695	0	-11.786
CUBIERTA	B4	ENVOLVENTE MAX	0.7	0	-24.09	0	-1.695	0	6.189
CUBIERTA	B4	ENVOLVENTE MAX	1.4	0	-19.47	0	-1.695	0	29.982
CUBIERTA	B4	ENVOLVENTE MAX	2.1	0	-13.57	0	-1.695	0	66.245
CUBIERTA	B4	ENVOLVENTE MAX	2.8	0	-8.96	0	-1.695	0	102.989
CUBIERTA	B4	ENVOLVENTE MAX	3.5	0	-6.06	0	-1.695	0	133.484
CUBIERTA	B4	ENVOLVENTE MAX	3.5	0	41.17	0	16.652	0	133.484
CUBIERTA	B4	ENVOLVENTE MAX	4.2	0	46.99	0	16.652	0	102.989
CUBIERTA	B4	ENVOLVENTE MAX	4.9	0	59.02	0	16.652	0	66.245
CUBIERTA	B4	ENVOLVENTE MAX	5.6	0	75.71	0	16.652	0	29.982
CUBIERTA	B4	ENVOLVENTE MAX	6.3	0	87.74	0	16.652	0	6.189
CUBIERTA	B4	ENVOLVENTE MAX	7	0	93.56	0	16.652	0	-11.786
CUBIERTA	B4	ENVOLVENTE MIN	0	0	-93.56	0	-16.652	0	-106.901
CUBIERTA	B4	ENVOLVENTE MIN	0.7	0	-87.74	0	-16.652	0	-50.405
CUBIERTA	B4	ENVOLVENTE MIN	1.4	0	-75.71	0	-16.652	0	-7.576
CUBIERTA	B4	ENVOLVENTE MIN	2.1	0	-59.02	0	-16.652	0	13.644
CUBIERTA	B4	ENVOLVENTE MIN	2.8	0	-46.99	0	-16.652	0	31.081
CUBIERTA	B4	ENVOLVENTE MIN	3.5	0	-41.17	0	-16.652	0	44.018
CUBIERTA	B4	ENVOLVENTE MIN	3.5	0	6.06	0	1.695	0	44.018
CUBIERTA	B4	ENVOLVENTE MIN	4.2	0	8.96	0	1.695	0	31.081
CUBIERTA	B4	ENVOLVENTE MIN	4.9	0	13.57	0	1.695	0	13.644
CUBIERTA	B4	ENVOLVENTE MIN	5.6	0	19.47	0	1.695	0	-7.576
CUBIERTA	B4	ENVOLVENTE MIN	6.3	0	24.09	0	1.695	0	-50.405
CUBIERTA	B4	ENVOLVENTE MIN	7	0	26.98	0	1.695	0	-106.901
CUBIERTA	B8	ENVOLVENTE MAX	0	0	-24.15	0	12.857	0	-39.137
CUBIERTA	B8	ENVOLVENTE MAX	0.22	0	-23.43	0	12.857	0	-33.9
CUBIERTA	B8	ENVOLVENTE MAX	0.44	0	-22.53	0	12.857	0	-28.841
CUBIERTA	B8	ENVOLVENTE MAX	0.66	0	-21.47	0	12.857	0	-23.997
CUBIERTA	B8	ENVOLVENTE MAX	0.88	0	-20.23	0	12.857	0	-19.406
CUBIERTA	B8	ENVOLVENTE MAX	1.1	0	-18.83	0	12.857	0	-15.105
CUBIERTA	B8	ENVOLVENTE MAX	1.32	0	-17.42	0	12.857	0	-11.119
CUBIERTA	B8	ENVOLVENTE MAX	1.54	0	-16.19	0	12.857	0	-7.421
CUBIERTA	B8	ENVOLVENTE MAX	1.76	0	-15.12	0	12.857	0	-3.974
CUBIERTA	B8	ENVOLVENTE MAX	1.98	0	-14.23	0	12.857	0	-0.736
CUBIERTA	B8	ENVOLVENTE MAX	2.2	0	-13.5	0	12.857	0	5.506
CUBIERTA	B8	ENVOLVENTE MIN	0	0	-65.4	0	-4.193	0	-112.099
CUBIERTA	B8	ENVOLVENTE MIN	0.22	0	-64.23	0	-4.193	0	-97.828
CUBIERTA	B8	ENVOLVENTE MIN	0.44	0	-62.46	0	-4.193	0	-83.88
CUBIERTA	B8	ENVOLVENTE MIN	0.66	0	-60.07	0	-4.193	0	-70.391
CUBIERTA	B8	ENVOLVENTE MIN	0.88	0	-57.07	0	-4.193	0	-57.494
CUBIERTA	B8	ENVOLVENTE MIN	1.1	0	-53.46	0	-4.193	0	-45.325
CUBIERTA	B8	ENVOLVENTE MIN	1.32	0	-49.84	0	-4.193	0	-33.973
CUBIERTA	B8	ENVOLVENTE MIN	1.54	0	-46.84	0	-4.193	0	-23.349
CUBIERTA	B8	ENVOLVENTE MIN	1.76	0	-44.45	0	-4.193	0	-13.318
CUBIERTA	B8	ENVOLVENTE MIN	1.98	0	-42.68	0	-4.193	0	-4.043
CUBIERTA	B8	ENVOLVENTE MIN	2.2	0	-41.52	0	-4.193	0	1.372
CUBIERTA	B12	ENVOLVENTE MAX	0	0	-24.15	0	4.193	0	-39.137
CUBIERTA	B12	ENVOLVENTE MAX	0.22	0	-23.43	0	4.193	0	-33.9
CUBIERTA	B12	ENVOLVENTE MAX	0.44	0	-22.53	0	4.193	0	-28.841
CUBIERTA	B12	ENVOLVENTE MAX	0.66	0	-21.47	0	4.193	0	-23.997
CUBIERTA	B12	ENVOLVENTE MAX	0.88	0	-20.23	0	4.193	0	-19.406
CUBIERTA	B12	ENVOLVENTE MAX	1.1	0	-18.83	0	4.193	0	-15.105
CUBIERTA	B12	ENVOLVENTE MAX	1.32	0	-17.42	0	4.193	0	-11.119
CUBIERTA	B12	ENVOLVENTE MAX	1.54	0	-16.19	0	4.193	0	-7.421
CUBIERTA	B12	ENVOLVENTE MAX	1.76	0	-15.12	0	4.193	0	-3.974
CUBIERTA	B12	ENVOLVENTE MAX	1.98	0	-14.23	0	4.193	0	-0.736
CUBIERTA	B12	ENVOLVENTE MAX	2.2	0	-13.5	0	4.193	0	5.506
CUBIERTA	B12	ENVOLVENTE MIN	0	0	-65.4	0	-12.857	0	-112.099
CUBIERTA	B12	ENVOLVENTE MIN	0.22	0	-64.23	0	-12.857	0	-97.828
CUBIERTA	B12	ENVOLVENTE MIN	0.44	0	-62.46	0	-12.857	0	-83.88
CUBIERTA	B12	ENVOLVENTE MIN	0.66	0	-60.07	0	-12.857	0	-70.391
CUBIERTA	B12	ENVOLVENTE MIN	0.88	0	-57.07	0	-12.857	0	-57.494
CUBIERTA	B12	ENVOLVENTE MIN	1.1	0	-53.46	0	-12.857	0	-45.325
CUBIERTA	B12	ENVOLVENTE MIN	1.32	0	-49.84	0	-12.857	0	-33.973
CUBIERTA	B12	ENVOLVENTE MIN	1.54	0	-46.84	0	-12.857	0	-23.349
CUBIERTA	B12	ENVOLVENTE MIN	1.76	0	-44.45	0	-12.857	0	-13.318
CUBIERTA	B12	ENVOLVENTE MIN	1.98	0	-42.68	0	-12.857	0	-4.043
CUBIERTA	B12	ENVOLVENTE MIN	2.2	0	-41.52	0	-12.857	0	1.372
CUBIERTA	B13	ENVOLVENTE MAX	0	0	-24.22	0	0.836	0	-4.965
CUBIERTA	B13	ENVOLVENTE MAX	0.536	0	-21.66	0	0.836	0	11.729
CUBIERTA	B13	ENVOLVENTE MAX	1.072	0	-17.08	0	0.836	0	47.526
CUBIERTA	B13	ENVOLVENTE MAX	1.608	0	-10.49	0	0.836	0	76.514
CUBIERTA	B13	ENVOLVENTE MAX	2.144	0	-2.43	0	0.836	0	92.94
CUBIERTA	B13	ENVOLVENTE MAX	2.68	0	9.12	0	0.836	0	95.526

CUBIERTA	B13	ENVOLVENTE MAX	4.824	0	92.81	0	0.836	0	-4.285
CUBIERTA	B13	ENVOLVENTE MAX	5.36	0	98.53	0	0.836	0	-20.185
CUBIERTA	B13	ENVOLVENTE MIN	0	0	-82.34	0	-0.836	0	-33.304
CUBIERTA	B13	ENVOLVENTE MIN	0.536	0	-76.61	0	-0.836	0	-0.602
CUBIERTA	B13	ENVOLVENTE MIN	1.072	0	-63.61	0	-0.836	0	12.461
CUBIERTA	B13	ENVOLVENTE MIN	1.608	0	-43.34	0	-0.836	0	22.531
CUBIERTA	B13	ENVOLVENTE MIN	2.144	0	-17.75	0	-0.836	0	28.602
CUBIERTA	B13	ENVOLVENTE MIN	2.68	0	0.86	0	-0.836	0	27.97
CUBIERTA	B13	ENVOLVENTE MIN	3.216	0	8.99	0	-0.836	0	22.739
CUBIERTA	B13	ENVOLVENTE MIN	3.752	0	17.04	0	-0.836	0	13.154
CUBIERTA	B13	ENVOLVENTE MIN	4.288	0	23.63	0	-0.836	0	-0.43
CUBIERTA	B13	ENVOLVENTE MIN	4.824	0	28.21	0	-0.836	0	-27.374
CUBIERTA	B13	ENVOLVENTE MIN	5.36	0	30.78	0	-0.836	0	-76.708
CUBIERTA	B14	ENVOLVENTE MAX	0	0	-14.35	0	1.757	0	-18.347
CUBIERTA	B14	ENVOLVENTE MAX	0.22	0	-13.54	0	1.757	0	-15.272
CUBIERTA	B14	ENVOLVENTE MAX	0.44	0	-12.39	0	1.757	0	-12.414
CUBIERTA	B14	ENVOLVENTE MAX	0.66	0	-10.9	0	1.757	0	-9.845
CUBIERTA	B14	ENVOLVENTE MAX	0.88	0	-9.08	0	1.757	0	-7.641
CUBIERTA	B14	ENVOLVENTE MAX	1.1	0	-6.91	0	1.757	0	-5.877
CUBIERTA	B14	ENVOLVENTE MAX	1.32	0	-4.74	0	1.757	0	-4.601
CUBIERTA	B14	ENVOLVENTE MAX	1.54	0	-2.92	0	1.757	0	-3.764
CUBIERTA	B14	ENVOLVENTE MAX	1.76	0	-1.43	0	1.757	0	-3.293
CUBIERTA	B14	ENVOLVENTE MAX	1.98	0	-0.28	0	1.757	0	-3.111
CUBIERTA	B14	ENVOLVENTE MAX	2.2	0	0.53	0	1.757	0	-3.145
CUBIERTA	B14	ENVOLVENTE MIN	0	0	-41.19	0	-1.757	0	-58.502
CUBIERTA	B14	ENVOLVENTE MIN	0.22	0	-39.72	0	-1.757	0	-49.579
CUBIERTA	B14	ENVOLVENTE MIN	0.44	0	-37.03	0	-1.757	0	-41.115
CUBIERTA	B14	ENVOLVENTE MIN	0.66	0	-33.11	0	-1.757	0	-33.378
CUBIERTA	B14	ENVOLVENTE MIN	0.88	0	-27.96	0	-1.757	0	-26.639
CUBIERTA	B14	ENVOLVENTE MIN	1.1	0	-21.59	0	-1.757	0	-21.166
CUBIERTA	B14	ENVOLVENTE MIN	1.32	0	-15.21	0	-1.757	0	-17.141
CUBIERTA	B14	ENVOLVENTE MIN	1.54	0	-10.18	0	-1.757	0	-14.382
CUBIERTA	B14	ENVOLVENTE MIN	1.76	0	-6.99	0	-1.757	0	-12.621
CUBIERTA	B14	ENVOLVENTE MIN	1.98	0	-4.73	0	-1.757	0	-11.588
CUBIERTA	B14	ENVOLVENTE MIN	2.2	0	-3.4	0	-1.757	0	-11.012
CUBIERTA	B15	ENVOLVENTE MAX	0	0	-13.5	0	5.506	0	4.193
CUBIERTA	B15	ENVOLVENTE MAX	0.35	0	-12.61	0	5.506	0	12.109
CUBIERTA	B15	ENVOLVENTE MAX	0.7	0	-11.28	0	5.506	0	22.247
CUBIERTA	B15	ENVOLVENTE MAX	1.05	0	-9.53	0	5.506	0	32.711
CUBIERTA	B15	ENVOLVENTE MAX	1.4	0	-7.51	0	5.506	0	42.839
CUBIERTA	B15	ENVOLVENTE MAX	1.75	0	-5.48	0	5.506	0	50.943
CUBIERTA	B15	ENVOLVENTE MAX	2.1	0	-3.45	0	5.506	0	57.022
CUBIERTA	B15	ENVOLVENTE MAX	2.45	0	-1.43	0	5.506	0	61.078
CUBIERTA	B15	ENVOLVENTE MAX	2.8	0	0.32	0	5.506	0	63.245
CUBIERTA	B15	ENVOLVENTE MAX	3.15	0	1.64	0	5.506	0	64.007
CUBIERTA	B15	ENVOLVENTE MAX	3.5	0	2.89	0	5.506	0	63.909
CUBIERTA	B15	ENVOLVENTE MIN	0	0	-41.52	0	1.372	0	-12.857
CUBIERTA	B15	ENVOLVENTE MIN	0.35	0	-39.83	0	1.372	0	-3.926
CUBIERTA	B15	ENVOLVENTE MIN	0.7	0	-36.6	0	1.372	0	1.662
CUBIERTA	B15	ENVOLVENTE MIN	1.05	0	-31.81	0	1.372	0	6.711
CUBIERTA	B15	ENVOLVENTE MIN	1.4	0	-26.05	0	1.372	0	10.953
CUBIERTA	B15	ENVOLVENTE MIN	1.75	0	-20.26	0	1.372	0	14.449
CUBIERTA	B15	ENVOLVENTE MIN	2.1	0	-14.48	0	1.372	0	17.233
CUBIERTA	B15	ENVOLVENTE MIN	2.45	0	-9.15	0	1.372	0	19.305
CUBIERTA	B15	ENVOLVENTE MIN	2.8	0	-5.29	0	1.372	0	20.699
CUBIERTA	B15	ENVOLVENTE MIN	3.15	0	-2.6	0	1.372	0	21.31
CUBIERTA	B15	ENVOLVENTE MIN	3.5	0	-1.45	0	1.372	0	21.09
CUBIERTA	B16	ENVOLVENTE MAX	0	0	1.45	0	-1.372	0	63.909
CUBIERTA	B16	ENVOLVENTE MAX	0.35	0	2.6	0	-1.372	0	64.007
CUBIERTA	B16	ENVOLVENTE MAX	0.7	0	5.29	0	-1.372	0	63.245
CUBIERTA	B16	ENVOLVENTE MAX	1.05	0	9.15	0	-1.372	0	61.078
CUBIERTA	B16	ENVOLVENTE MAX	1.4	0	14.48	0	-1.372	0	57.022
CUBIERTA	B16	ENVOLVENTE MAX	1.75	0	20.26	0	-1.372	0	50.943
CUBIERTA	B16	ENVOLVENTE MAX	2.1	0	26.05	0	-1.372	0	42.839
CUBIERTA	B16	ENVOLVENTE MAX	2.45	0	31.81	0	-1.372	0	32.711
CUBIERTA	B16	ENVOLVENTE MAX	2.8	0	36.6	0	-1.372	0	22.247
CUBIERTA	B16	ENVOLVENTE MAX	3.15	0	39.83	0	-1.372	0	12.109
CUBIERTA	B16	ENVOLVENTE MAX	3.5	0	41.52	0	-1.372	0	4.193
CUBIERTA	B16	ENVOLVENTE MIN	0	0	-2.89	0	-5.506	0	21.09
CUBIERTA	B16	ENVOLVENTE MIN	0.35	0	-1.64	0	-5.506	0	21.31
CUBIERTA	B16	ENVOLVENTE MIN	0.7	0	-0.32	0	-5.506	0	20.699
CUBIERTA	B16	ENVOLVENTE MIN	1.05	0	1.43	0	-5.506	0	19.305
CUBIERTA	B16	ENVOLVENTE MIN	1.4	0	3.45	0	-5.506	0	17.233

7.7.2 FUERZAS EN COLUMNAS

COLUMN FORCES
UNID: kN-m

Story	Column	Load	Loc	P	V2	V3	T	M2	M3
CUBIERTA	C1	ENVOLVENTE MAX	0	-44.19	1.08	23.68	4.642	62.451	18.609
CUBIERTA	C1	ENVOLVENTE MAX	0.4	-42.81	1.08	23.68	4.642	53.575	18.178
CUBIERTA	C1	ENVOLVENTE MAX	0.8	-41.43	1.08	23.68	4.642	44.698	17.748
CUBIERTA	C1	ENVOLVENTE MAX	1.2	-40.04	1.08	23.68	4.642	35.821	17.318
CUBIERTA	C1	ENVOLVENTE MAX	1.6	-38.66	1.08	23.68	4.642	26.944	22.122
CUBIERTA	C1	ENVOLVENTE MAX	2	-37.28	1.08	23.68	4.642	18.067	29.019
CUBIERTA	C1	ENVOLVENTE MAX	2.4	-35.9	1.08	23.68	4.642	13.654	43.721
CUBIERTA	C1	ENVOLVENTE MAX	2.8	-34.52	1.08	23.68	4.642	22.626	59.827
CUBIERTA	C1	ENVOLVENTE MAX	3.2	-33.13	1.08	23.68	4.642	32.892	75.932
CUBIERTA	C1	ENVOLVENTE MAX	3.6	-31.75	1.08	23.68	4.642	43.159	92.038
CUBIERTA	C1	ENVOLVENTE MAX	4	-30.37	1.08	23.68	4.642	53.426	111.071
CUBIERTA	C1	ENVOLVENTE MIN	0	-144.15	-47.75	-25.67	-4.642	-51.974	-79.947
CUBIERTA	C1	ENVOLVENTE MIN	0.4	-142.31	-47.75	-25.67	-4.642	-42.301	-60.846
CUBIERTA	C1	ENVOLVENTE MIN	0.8	-140.47	-47.75	-25.67	-4.642	-32.628	-41.745
CUBIERTA	C1	ENVOLVENTE MIN	1.2	-138.62	-47.75	-25.67	-4.642	-22.954	-22.645
CUBIERTA	C1	ENVOLVENTE MIN	1.6	-136.78	-47.75	-25.67	-4.642	-13.281	-8.779
CUBIERTA	C1	ENVOLVENTE MIN	2	-134.94	-47.75	-25.67	-4.642	-3.608	2.994
CUBIERTA	C1	ENVOLVENTE MIN	2.4	-133.09	-47.75	-25.67	-4.642	2.896	14.628
CUBIERTA	C1	ENVOLVENTE MIN	2.8	-131.25	-47.75	-25.67	-4.642	-6.574	15.576
CUBIERTA	C1	ENVOLVENTE MIN	3.2	-129.41	-47.75	-25.67	-4.642	-16.044	15.152
CUBIERTA	C1	ENVOLVENTE MIN	3.6	-127.56	-47.75	-25.67	-4.642	-25.514	14.723
CUBIERTA	C1	ENVOLVENTE MIN	4	-125.72	-47.75	-25.67	-4.642	-34.984	14.293
CUBIERTA	C2	ENVOLVENTE MAX	0	-105.71	4.29	26.32	4.642	67.878	33.849
CUBIERTA	C2	ENVOLVENTE MAX	0.4	-104.33	4.29	26.32	4.642	57.349	32.135
CUBIERTA	C2	ENVOLVENTE MAX	0.8	-102.95	4.29	26.32	4.642	46.821	30.42
CUBIERTA	C2	ENVOLVENTE MAX	1.2	-101.57	4.29	26.32	4.642	36.292	28.706
CUBIERTA	C2	ENVOLVENTE MAX	1.6	-100.19	4.29	26.32	4.642	25.764	35.432
CUBIERTA	C2	ENVOLVENTE MAX	2	-98.8	4.29	26.32	4.642	15.237	45.529
CUBIERTA	C2	ENVOLVENTE MAX	2.4	-97.42	4.29	26.32	4.642	9.305	70.428
CUBIERTA	C2	ENVOLVENTE MAX	2.8	-96.04	4.29	26.32	4.642	18.44	96.371
CUBIERTA	C2	ENVOLVENTE MAX	3.2	-94.66	4.29	26.32	4.642	27.578	122.314
CUBIERTA	C2	ENVOLVENTE MAX	3.6	-93.27	4.29	26.32	4.642	36.717	152.508
CUBIERTA	C2	ENVOLVENTE MAX	4	-91.89	4.29	26.32	4.642	45.856	184.133
CUBIERTA	C2	ENVOLVENTE MIN	0	-308.22	-79.06	-24.33	-4.642	-52.168	-132.113
CUBIERTA	C2	ENVOLVENTE MIN	0.4	-306.38	-79.06	-24.33	-4.642	-42.436	-100.489
CUBIERTA	C2	ENVOLVENTE MIN	0.8	-304.53	-79.06	-24.33	-4.642	-32.703	-68.864
CUBIERTA	C2	ENVOLVENTE MIN	1.2	-302.69	-79.06	-24.33	-4.642	-22.971	-37.24
CUBIERTA	C2	ENVOLVENTE MIN	1.6	-300.85	-79.06	-24.33	-4.642	-13.239	-14.056
CUBIERTA	C2	ENVOLVENTE MIN	2	-299	-79.06	-24.33	-4.642	-3.509	5.757
CUBIERTA	C2	ENVOLVENTE MIN	2.4	-297.16	-79.06	-24.33	-4.642	1.627	23.519
CUBIERTA	C2	ENVOLVENTE MIN	2.8	-295.32	-79.06	-24.33	-4.642	-8.305	21.843
CUBIERTA	C2	ENVOLVENTE MIN	3.2	-293.48	-79.06	-24.33	-4.642	-18.24	20.13
CUBIERTA	C2	ENVOLVENTE MIN	3.6	-291.63	-79.06	-24.33	-4.642	-28.175	18.416
CUBIERTA	C2	ENVOLVENTE MIN	4	-289.79	-79.06	-24.33	-4.642	-38.11	16.702
CUBIERTA	C3	ENVOLVENTE MAX	0	-44.19	47.75	23.68	4.642	62.451	79.947
CUBIERTA	C3	ENVOLVENTE MAX	0.4	-42.81	47.75	23.68	4.642	53.575	60.846
CUBIERTA	C3	ENVOLVENTE MAX	0.8	-41.43	47.75	23.68	4.642	44.698	41.745
CUBIERTA	C3	ENVOLVENTE MAX	1.2	-40.04	47.75	23.68	4.642	35.821	22.645
CUBIERTA	C3	ENVOLVENTE MAX	1.6	-38.66	47.75	23.68	4.642	26.944	8.779
CUBIERTA	C3	ENVOLVENTE MAX	2	-37.28	47.75	23.68	4.642	18.067	-2.994
CUBIERTA	C3	ENVOLVENTE MAX	2.4	-35.9	47.75	23.68	4.642	13.654	-14.628
CUBIERTA	C3	ENVOLVENTE MAX	2.8	-34.52	47.75	23.68	4.642	22.626	-15.576
CUBIERTA	C3	ENVOLVENTE MAX	3.2	-33.13	47.75	23.68	4.642	32.892	-15.152
CUBIERTA	C3	ENVOLVENTE MAX	3.6	-31.75	47.75	23.68	4.642	43.159	-14.723
CUBIERTA	C3	ENVOLVENTE MAX	4	-30.37	47.75	23.68	4.642	53.426	-14.293
CUBIERTA	C3	ENVOLVENTE MIN	0	-144.15	-1.08	-25.67	-4.642	-51.974	-18.609
CUBIERTA	C3	ENVOLVENTE MIN	0.4	-142.31	-1.08	-25.67	-4.642	-42.301	-18.178
CUBIERTA	C3	ENVOLVENTE MIN	0.8	-140.47	-1.08	-25.67	-4.642	-32.628	-17.748
CUBIERTA	C3	ENVOLVENTE MIN	1.2	-138.62	-1.08	-25.67	-4.642	-22.954	-17.318
CUBIERTA	C3	ENVOLVENTE MIN	1.6	-136.78	-1.08	-25.67	-4.642	-13.281	-22.122
CUBIERTA	C3	ENVOLVENTE MIN	2	-134.94	-1.08	-25.67	-4.642	-3.608	-29.019
CUBIERTA	C3	ENVOLVENTE MIN	2.4	-133.09	-1.08	-25.67	-4.642	2.896	-43.721
CUBIERTA	C3	ENVOLVENTE MIN	2.8	-131.25	-1.08	-25.67	-4.642	-6.574	-59.827
CUBIERTA	C3	ENVOLVENTE MIN	3.2	-129.41	-1.08	-25.67	-4.642	-16.044	-75.932
CUBIERTA	C3	ENVOLVENTE MIN	3.6	-127.56	-1.08	-25.67	-4.642	-25.514	-92.038

CUBIERTA	C3	ENVOLVENTE MIN	4	-125.72	-1.08	-25.67	-4.642	-34.984	-111.071
CUBIERTA	C4	ENVOLVENTE MAX	0	-105.71	79.06	26.32	4.642	67.878	132.113
CUBIERTA	C4	ENVOLVENTE MAX	0.4	-104.33	79.06	26.32	4.642	57.349	100.489
CUBIERTA	C4	ENVOLVENTE MAX	0.8	-102.95	79.06	26.32	4.642	46.821	68.864
CUBIERTA	C4	ENVOLVENTE MAX	1.2	-101.57	79.06	26.32	4.642	36.292	37.24
CUBIERTA	C4	ENVOLVENTE MAX	1.6	-100.19	79.06	26.32	4.642	25.764	14.056
CUBIERTA	C4	ENVOLVENTE MAX	2	-98.8	79.06	26.32	4.642	15.237	-5.757
CUBIERTA	C4	ENVOLVENTE MAX	2.4	-97.42	79.06	26.32	4.642	9.305	-23.519
CUBIERTA	C4	ENVOLVENTE MAX	2.8	-96.04	79.06	26.32	4.642	18.44	-21.843
CUBIERTA	C4	ENVOLVENTE MAX	3.2	-94.66	79.06	26.32	4.642	27.578	-20.13
CUBIERTA	C4	ENVOLVENTE MAX	3.6	-93.27	79.06	26.32	4.642	36.717	-18.416
CUBIERTA	C4	ENVOLVENTE MAX	4	-91.89	79.06	26.32	4.642	45.856	-16.702
CUBIERTA	C4	ENVOLVENTE MIN	0	-308.22	-4.29	-24.33	-4.642	-52.168	-33.849
CUBIERTA	C4	ENVOLVENTE MIN	0.4	-306.38	-4.29	-24.33	-4.642	-42.436	-32.135
CUBIERTA	C4	ENVOLVENTE MIN	0.8	-304.53	-4.29	-24.33	-4.642	-32.703	-30.42
CUBIERTA	C4	ENVOLVENTE MIN	1.2	-302.69	-4.29	-24.33	-4.642	-22.971	-28.706
CUBIERTA	C4	ENVOLVENTE MIN	1.6	-300.85	-4.29	-24.33	-4.642	-13.239	-35.432
CUBIERTA	C4	ENVOLVENTE MIN	2	-299	-4.29	-24.33	-4.642	-3.509	-45.529
CUBIERTA	C4	ENVOLVENTE MIN	2.4	-297.16	-4.29	-24.33	-4.642	1.627	-70.428
CUBIERTA	C4	ENVOLVENTE MIN	2.8	-295.32	-4.29	-24.33	-4.642	-8.305	-96.371
CUBIERTA	C4	ENVOLVENTE MIN	3.2	-293.48	-4.29	-24.33	-4.642	-18.24	-122.314
CUBIERTA	C4	ENVOLVENTE MIN	3.6	-291.63	-4.29	-24.33	-4.642	-28.175	-152.508
CUBIERTA	C4	ENVOLVENTE MIN	4	-289.79	-4.29	-24.33	-4.642	-38.11	-184.133

8 ESPECIFICACIONES TÉCNICAS

Los materiales utilizados son:

Concreto	21.1 MPa para vigas, placas, zapatas y
columnas. Concreto	14 MPa (para concreto de limpieza).
Aceropara refuerzo	fy = 420 MPa para todos los diámetros.
Acero estructural	A36 pernos de anclaje y platinas
Acero estructural	A500 en perfiles metálicos

9 CONCLUSIONES Y RECOMENDACIONES

Habiendo finalizado el diseño y análisis estructural de la institución educativa del valle – sede Julio Cesar Arce Grupo 002 basado en la Norma Colombiana de Diseño y Construcción Sismo Resistente Ley 400 de 1997 (Modificada Ley 1229 de 2008) y Decreto 926 de Marzo de 2010, Decreto 092 del 17 de Enero de
2011, Decreto 0340 del 13 de Febrero de 2012 y en el Reglamento para Concreto Estructural ACI 318S-08, hemos llegado a las siguientes conclusiones y recomendaciones.

- Se cumplió satisfactoriamente con los objetivos del cálculo y diseño estructural mediante la aplicación de la norma sismo resistente (NSR-10) y el reglamento para concreto estructural ACI 318S-08, además de la ayuda del software ETABS V9.7.4 se puede garantizar el buen funcionamiento de la estructura que presenta una buena respuesta ante un evento sísmico.
- La revisión de los desplazamientos laterales (derivas) de la estructura teniendo en cuenta las direcciones "X" y "y", nos arrojó que los resultados obtenidos son aceptables permitiendo un buen funcionamiento ante la actuación de un sismo y que cumple con lo establecido en la norma sismo resistente (NSR-10).
- En cuanto a la revisión de columnas y vigas determinamos que cumplen con los requisitos, ya que en estructuras de edificios aporticados es obligatorio que los miembros horizontales fallen antes que los verticales, permitiendo de esa manera un retraso del colapso total de la estructura.
- Para la construcción de la estructura se recomienda llevar un estricto control en la calidad de los materiales a utilizar, ya que estos deberán cumplir con requisitos especiales para el buen funcionamiento de la edificación. Además que estos deberán ser supervisados a la hora de la puesta en marcha por el ingeniero residente.

10 BIBLIOGRAFÍA

•Norma Colombiana de Diseño y Construcción Sismo Resistente Ley 400 de 1997 (Modificada Ley 1229 de 2008) y Decreto 926 de Marzo de 2010, Decreto 092 del 17 de Enero de 2011, Decreto 0340 del 13 de Febrero de 2012
•Reglamento para Concreto Estructural ACI 318S-08.

ELABORACIÓN DE DIAGNÓSTICOS, ESTUDIOS TÉCNICOS, AJUSTES A DISEÑOS O DISEÑOS INTEGRALES, CONSTRUCCIÓN Y PUESTA EN FUNCIONAMIENTO DE LAS OBRAS DE INFRAESTRUCTURA EDUCATIVA – UBICADAS EN EL DEPARTAMENTO DE VALLE DEL CAUCA – GRUPO 02

Contrato No. PAF-JU02-G02DC-2015

INFORME CÁLCULO Y ANÁLISIS ESTRUCTURAL INSTITUCIÓN EDUCATIVA DEL VALLE – SEDE SIXTO MARÍA ROJAS-RAMPA.

BOGOTÁ
2017

CONTROL DE REVISIONES

REVISIÓN	FECHA	OBSERVACIONES
1	30/12/16	Primera Redacción

Elaborado por: Edgar Rolando Barrera Firma:	**Revisado por**: Javier José Carrillo Ortega Fecha: febrero 2017 Firma:	**Aprobado por:** Director de Interventoría Fecha: Firma:

TABLA DE CONTENIDO

LISTA DE FOTOGRAFÍAS

1 INTRODUCCIÓN

El presente documento contiene las memorias de análisis y diseño estructural correspondiente al proyecto de la "INSTITUCIÓN EDUCATIVA DEL VALLE – SEDE SIXTO MARÍA ROJAS-RAMPA" ubicado en el municipio de JAMUNDÍ en el departamento de VALLE DEL CAUCA de acuerdo al contrato No. PAF-JU02-G02DC-2015 realizando el estudio de acuerdo a la Norma Colombiana de Diseño y Construcción Sismo Resistente Ley 400 de 1997 (Modificada Ley 1229 de 2008) y Decreto 926 de Marzo de 2010, Decreto 092 del 17 de Enero de 2011, Decreto 0340 del 13 de Febrero de 2012 y en el Reglamento para Concreto Estructural ACI 318S-08.

Para la evaluación de la edificación se ha seguido un proceso normativo que incluye las etapas de inspección, evaluación, pruebas y ensayos, revisión analítica, propuesta de intervención y soluciones constructivas, que tomen en cuenta los aspectos de resistencia, ductilidad, comportamiento y estabilidad de la estructura.

2 DESCRIPCIÓN DEL TRABAJO DE OFICINA

De acuerdo a los planos arquitectónicos y visitas realizadas en campo se procedió al desarrollo del estudio y análisis estructural con la ayuda de diferentes programas tales como ETABS v9.7.4, el cual tiene en cuenta los efectos de segundo orden. Por otro lado se siguieron las recomendaciones descrita en el respectivo estudio de suelos

3 DESCRIPCIÓN DE LOS CRITERIOS BÁSICOS DE DISEÑO

El proyecto se soluciona mediante la construcción de una estructura aporticada en concreto, con placa maciza y vigas descolgadas. Se manejan luces que varían entre 2.00m y 6.50m en los dos sentidos de la estructura.

4 NORMAS Y CÓDIGOS A LOS CUALES SE CIÑEN LOS DISEÑOS

El diseño de todas las estructuras se realizó basado en la Norma Colombiana de

Diseño y Construcción Sismo Resistente Ley 400 de 1997 (Modificada Ley 1229 de 2008) y Decreto 926 de Marzo de 2010, Decreto 092 del 17 de Enero de 2011, Decreto 0340 del 13 de Febrero de 2012 y en el Reglamento para Concreto Estructural ACI 318S-08.

5 DESCRIPCIÓN DE LA METODOLOGÍA DE DISEÑO EMPLEADA.

El proyecto se soluciona mediante la construcción de una estructura aporticada en concreto, con placa maciza y vigas descolgadas. Se manejan luces que varían entre 2.00m y 6.50m en los dos sentidos de la estructura.

Las cargas horizontales fueron distribuidas entre los diferentes pórticos en proporción a su rigidez y teniendo en cuenta los efectos de torsión.

El dimensionamiento dado a todos los elementos que intervienen en las estructuras satisfacen los requerimientos de solicitación ocasionados por las derivas presentes. Las cargas vivas de diseño son: **5.00kN/m²** para placa maciza.

Para la cimentación se siguieron las recomendaciones descritas en el respectivo estudio de suelos, por lo cual se diseñaron zapatas apoyadas a una profundidad de 1.00m desde el nivel actual del terreno. Los cimientos estarán conectados entre sí por vigas de amarre diseñadas según lo establecido en A.3.6.4.2 de la NSR-10. La capacidad portante de seguridad admisible del suelo es **0.12 MPa** y el tipo de suelo es **E**.

6 DESCRIPCIÓN Y ANÁLISIS DE LAS CONDICIONES EXISTENTES

El sitio donde se procederá a la construcción de la estructura se encuentra ubicado una edificación existente, como se evidenciara en las fotos mostradas a continuación.

1. Fotografía Estructura existente

Fuente: Propia

2. Fotografía Estructura existente

Fuente: Propia

3. Fotografía Estructura existente

Fuente: Propia

4. Fotografía Estructura existente

Fuente: Propia

MEMORIAL DE RESPONSABILIDAD

JAMUNDI, Mayo de 2017.

Señores
PLANEACION MUNICIPAL
La Ciudad

Yo, **EDGAR ROLANDO BARRERA,** ingeniero civil con Matrícula Profesional Nº **15202-102710** de **BOYACÁ,** debidamente registrado en el consejo profesional de Ingeniería y Arquitectura de Boyacá, presento los cálculos y diseños estructurales elaborados de acuerdo a los requerimientos de la **NORMA COLOMBIANA DE DISEÑO Y CONSTRUCCIÓN SISMO RESISTENTE LEY 400 DE 1997 (MODIFICADA LEY 1229 DE 2008) Y DECRETO 926 DE MARZO DE 2010**, para el I.E. SIXTO MARIA ROJAS-RAMPA ubicado en el municipio de JAMUNDI (VALLE DEL CAUCA), declaro que asumo la responsabilidad por los perjuicios que causa de ellos puedan deducirse, exonerando a PLANEACION de cualquier responsabilidad.

Acepto y reconozco que la revisión efectuada por PLANEACION no constituye una aprobación al Diseño Estructural, sino una verificación del cumplimiento de la **NORMA COLOMBIANA DE DISEÑO Y CONSTRUCCIÓN SISMO RESISTENTE**.

Atentamente,

_____

EDGAR ROLANDO BARRERA

ING. ESTRUCTURAL

T.P. 15202-102710 BYC


REPUBLICA DE COLOMBIA
CONSEJO PROFESIONAL NACIONAL DE INGENIERIA
Y SUS PROFESIONES AUXILIARES
MAT. No 15202103710BYC
INGENIERO CIVIL
FECHA 18/12/2003
BARRERA SALINAS
EDGAR ROLANDO
C.C. 7175981
UNIVERSIDAD PEDAGOGICA Y
TECNOLOGICA DE COLOMBIA
PRESIDENTE DEL CONSEJO

7 MEMORIA DE CÁLCULO

7.1 AVALUO DE CARGAS

PROYECTO: INSTITUCION EDUCATIVA SIXTO MARIA - RAMPA

AVALUO DE CARGAS

1. PLACA MACIZA RAMPA

Placa Maciza e=0.10m	0.10x24		2.40 kN/m²
Impermeabilización	20x0.05		1.00 kN/m²
		CM	3.40 kN/m²
		CV	5.00 kN/m²
		CR	8.40 kN/m²

CU = 1.2x3.4+1.6x5 = 12.1 kN/m²

Espesor de placa equivalente:

e=CM/24 0.142 m

7.2 ANALISIS SISMICO

ZONA DE AMENAZA SÍSMICA
INTERMEDIA

EFECTOS LOCALES

Perfil de Suelo	E
Coeficiente Aa	0.25
Coeficiente Av	0.25

COEFICIENTE DE IMPORTANCIA

Grupo de Uso	III
Coeficiente de importancia III	1.25

PERIODO FUNDAMENTAL DE LA EDIFICACIÓN

$T_a = C_t h^{\alpha}$		
C_t =	0.047	
h =	4.00	m
α =	0.90	
T_a=	0.16	Seg

VARIACIÓN COEFICIENTE DE CAPACIDAD DE DISIPACIÓN DE ENERGÍA

Ro: Coeficiente de capacidad de disipación de energía básico
R: Coeficiente de capacidad de disipación de energía, para ser empleado en el diseño.
ϕ_a: Coeficiente de reducción de R causado por irregularidades en altura de la edificación
ϕ_p: Coeficiente de reducción de R causado por irregularidades en planta de la edificación
ϕ_r: Coeficiente de reducción de R causado por ausencia de redundancia en el sistema estructural de resistencia sísmica

Ro	1.50
ϕ_a	1.00
ϕ_p	1.00
ϕ_r	1.00
ϕ	1.00
R	1.50

TIPO	DESCRIPCION	VALOR
	N.A	ϕ_p: 1.00
	N.A	ϕ_a: 1.00
	N.A	ϕ_r: 1.00
	N.A	ϕ: 1.00

ESPECTRO DE DISEÑO (AMORTIGUAMIENTO ξ=5% DEL CRÍTICO)

Fa: Factor de ampliación de la aceleración.
Fv: Factor de ampliación de la aceleración en el rango de velocidades constantes.
Sa: Valor del espectro de aceleraciones de diseño para un periodo de vibración dado.

Aa: Coeficiente que representa la aceleración horizontal pico efectiva para diseño.
Av: Coeficiente que representa la velocidad horizontal pico efectiva para diseño.
T: Periodo de vibración del sistema elástico, en segundos.
T_C: Periodo de vibración, en segundos, correspondiente a la transición entre la zona de aceleración constante del espectro de diseño, para periodos cortos, y la parte descendiente del mismo.
T_L: Periodo de vibración, en segundos, correspondiente al inicio de la zona de desplazamiento aproximadamente constante del espectro de diseño para periodos largos.

ZONA DE AMENAZA INTERMEDIA

T_o:	0.21	Seg
T_C:	0.99	Seg
T_L:	7.20	Seg
Aa:	0.25	
Av:	0.25	
Fa:	1.45	
Fv:	3.00	

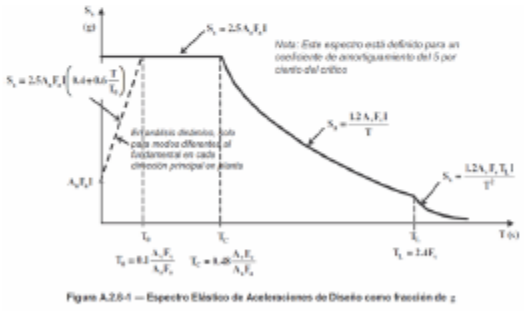
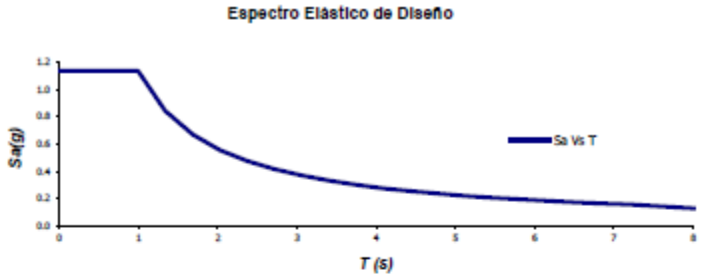
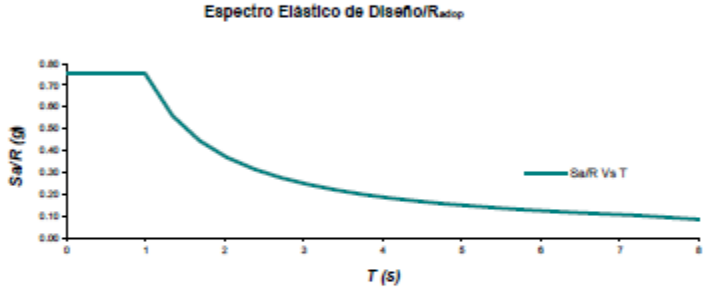


Figura A.2.6-1 — Espectro Elástico de Aceleraciones de Diseño como fracción de g

T (Seg)	Sa (%g)	Sa/$R_{adoptado}$ (%g)
0.00	1.133	0.755
0.05	1.133	0.755
0.10	1.133	0.755
0.16	1.133	0.755
0.21	1.133	0.755
0.40	1.133	0.755
0.60	1.133	0.755
0.80	1.133	0.755
0.99	1.133	0.755
1.34	0.841	0.561
1.68	0.669	0.446
2.03	0.555	0.370
2.37	0.474	0.316
2.72	0.414	0.276
3.06	0.367	0.245
3.41	0.330	0.220
3.75	0.300	0.200
4.10	0.275	0.183
4.44	0.253	0.169
4.79	0.235	0.157
5.13	0.219	0.146
5.48	0.205	0.137
5.82	0.193	0.129
6.17	0.182	0.122
6.51	0.173	0.115
6.86	0.164	0.109
7.20	0.156	0.104
8.20	0.120	0.080
9.20	0.096	0.064





Sistema de resistencia Sísmica: Pórticos resistentes a momentos con Capacidad Moderada de Disipación de Energía (DMO).

Nota: El sistema de pórtico es un sistema estructural compuesto por un pórtico espacial, resistente a momentos, esencialmente completo, sin diagonales, que resiste todas las cargas verticales y las fuerzas horizontales.

MODELO MATEMÁTICO

Modelo Tridimensional con Diafragma Rígido: En este modelo los entrepisos se consideran diafragmas infinitamente rigidos en su propio plano. La masa de cada diafragma se considera concentrada en su centro de masa. Los efectos torsionales accidentales son incluidos haciendo ajustes en la localización de los centros de masa de los diafragmas.
Los efectos direccionales son tomados en cuenta a través de las componentes de los desplazamientos de los grados de libertad horizontales ortogonales del diafragma.

PROYECTO: INSTITUCION EDUCATIVA SIXTO MARIA - RAMPA
ANÁLISIS SÍSMICO (ESPECTRO DE UMBRAL DE DAÑO NSR-10)

ZONA DE AMENAZA SISMICA
INTERMEDIA

EFECTOS LOCALES

Perfil de Suelo	E
Coeficiente Ad	0.09
Coeficiente Fv	3.50

COEFICIENTE DE IMPORTANCIA

Grupo de Uso	III
Coeficiente de importancia III	1.25
Coeficiente de Sitio Ŝ:	4.38

ESPECTRO DE UMBRAL DE DAÑO (AMORTIGUAMIENTO ξ=2% DEL CRÍTICO)

Sad: Valor del espectro de aceleraciones del umbral de daño para un periodo de vibración dado.
Ad: Máxima aceleración pico efectiva para el umbral de daño.
T: Periodo de vibración del sistema elástico, en segundos.
T_{Cd}: Periodo de vibración, en segundos, correspondiente a la transición entre la zona de aceleración constante del espectro sísmico del umbral de daño, para periodos cortos, y la parte descendiente del mismo.
T_{Ld}: Periodo de vibración, en segundos, correspondiente a la transición entre la zona de desplazamiento constante del espectro sísmico del umbral de daño, para periodos largos.

Ad: 0.09
T_{Cd}: 2.19 Seg
T_{Ld}: 10.5 Seg

T (Seg)	Sad (%g)
0.00	0.090
0.05	0.126
0.10	0.162
0.15	0.198
0.20	0.234
0.25	0.270
0.49	0.270
0.73	0.270
0.98	0.270
1.22	0.270
1.46	0.270
1.70	0.270
1.95	0.270

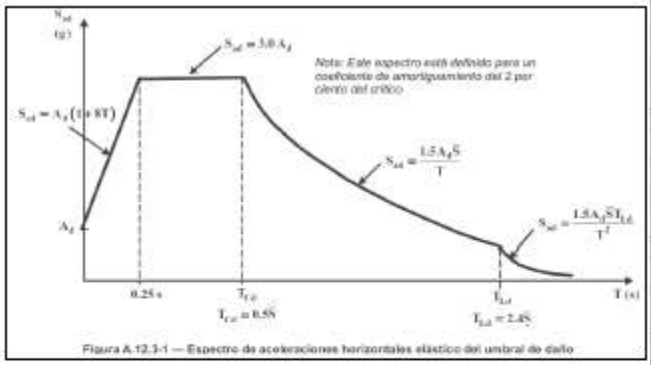
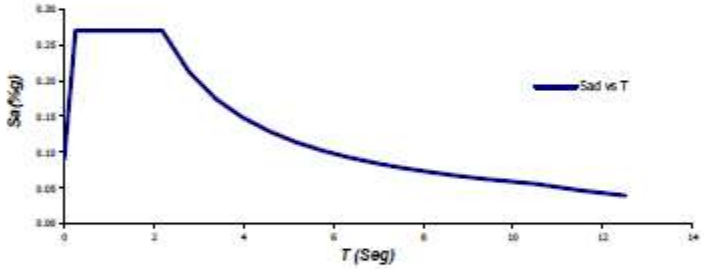


Figura A.12.3-1 — Espectro de aceleraciones horizontales elástico del umbral de daño

2.19	0.270
2.78	0.212
3.38	0.175
3.97	0.149
4.56	0.129
5.16	0.115
5.75	0.103
6.34	0.093
6.94	0.085
7.53	0.078
8.13	0.073
8.72	0.068
9.31	0.063
9.91	0.060
10.50	0.056
11.50	0.047
12.50	0.040

Espectro Del Umbral de Daño

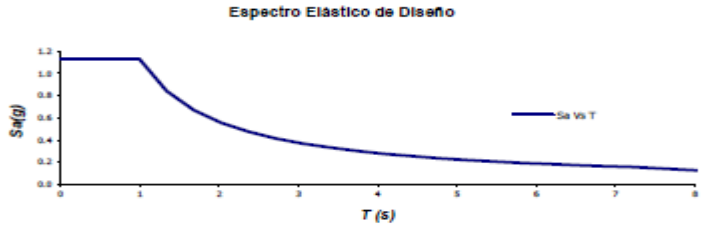


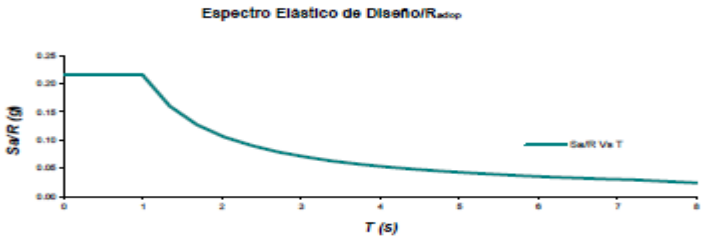
Sistema de resistencia Sísmica: Pórticos resistentes a momentos con Capacidad Moderada de Disipación de Energía (DMO).

Nota: El sistema de pórtico es un sistema estructural compuesto por un pórtico espacial, resistente a momentos, esencialmente completo, sin diagonales, que resiste todas las cargas verticales y las fuerzas horizontales.

MODELO MATEMÁTICO

Modelo Tridimensional con Diafragma Rígido: En este modelo los entrepisos se consideran diafragmas infinitamente rigidos en su propio plano. La masa de cada diafragma se considera concentrada en su centro de masa. Los efectos torsionales accidentales son incluidos haciendo ajustes en la localización de los centros de masa de los diafragmas.
Los efectos direccionales son tomados en cuenta a través de las componentes de los desplazamientos de los grados de libertad horizontales ortogonales del diafragma.





Sistema de resistencia Sísmica: Pórticos resistentes a momentos con Capacidad Especial de Disipación de Energía (DES).

Nota: El sistema de pórtico es un sistema estructural compuesto por un pórtico espacial, resistente a momentos, esencialmente completo, sin diagonales, que resiste todas las cargas verticales y las fuerzas horizontales.

MODELO MATEMÁTICO

Modelo Tridimensional con Diafragma Rígido: En este modelo los entrepisos se consideran diafragmas infinitamente rigidos en su propio plano. La masa de cada diafragma se considera concentrada en su centro de masa. Los efectos torsionales accidentales son incluidos haciendo ajustes en la localización de los centros de masa de los diafragmas.
Los efectos direccionales son tomados en cuenta a través de las componentes de los desplazamientos de los grados de libertad horizontales ortogonales del diafragma.

7.2.1 CALCULO CORTANTE BASAL

CALCULO DEL CORTANTE BASAL DE LA ESTRUCTURA

$H_{edificio}$ =	4.00	m	
Tipo de Perfil:	E		
Aa =	0.25	g	
Av =	0.25	g	
Fa =	1.20		
Fv =	3.00		
T_c =	1.20	Seg	
C_t =	0.047		
α =	0.90		
T_a =	0.16	Seg	
C_u =	1.20		
$C_u T_a$ =	0.20	Seg	
Modelación estructural =	0.1800	Seg	
ΔT =	9.98	%	Ok!
$T_{adoptado}$ =	0.18	Seg	
S_a =	0.852		S_a obtenido del espectro de diseño
g =	9.81	m/s^2	
M =	84.67	Ton	Masa obtenida del modelo
V_s =	707.68	kN	
90% Vs =	636.91	kN	Cortante basal para comparación de acuerdo a A.5.4.5 NSR-10

MODELO INICIAL
Response Espectrum Base Reactions

PORCENTAJE PARA REVISIÓN DE CORTANTE BASAL DE ACUERDO A A.5.4.5 NSR-10: 90.0 %

	F1 (kN)	F2 (kN)	Total (kN)	Factor		g corregido
V_{sx} =	228.05	76.94	240.68	2.646	25.960	Se aplica en SISMO X
V_{sy} =	76.94	262.04	273.10	2.332	22.878	Se aplica en SISMO Y

MODELO CORREGIDO
Response Espectrum Base Reactions

	F1 (kN)	F2 (kN)	Total (kN)	90% Vs (kN)
V_{sx} =	603.49	203.6	636.91	636.9
V_{sy} =	179.37	610.89	636.68	636.9

CALCULO DEL CORTANTE BASAL DE LA ESTRUCTURA

$H_{edificio}$=	4.00	m	
Tipo de Perfil:	E		
Ad =	0.09	g	
Fv =	3.00		
C_t =	0.047		
α =	0.90		
T_a =	0.16	Seg	
C_u =	1.20		
$C_u T_a$ =	0.20	Seg	
modelación estructural =	0.18	Seg	
AT =	9.98	%	Ok!
$T_{adoptado}$ =	0.1800	Seg	
S_a =	0.900		S_a obtenido del espectro de diseño
g =	9.81	m/s^2	
M =	84.67	Ton	Masa obtenida del modelo
V_s =	747.55	kN	
90% Vs =	672.80	kN	Cortante basal para comparación de acuerdo a A.5.4.5 NSR-10

MODELO INICIAL
Response Espectrum Base Reactions

PORCENTAJE PARA REVISIÓN DE CORTANTE BASAL DE ACUERDO A A.5.4.5 NSR-10: 90.0 %

	F1 (kN)	F2 (kN)	Total (kN)	Factor		g corregido
$V_{s(x)}$=	67.98	19.46	70.71	9.515	93.340	Se aplica en SISMO X
$V_{s(y)}$=	19.46	59.25	62.36	10.788	105.833	Se aplica en SISMO Y

MODELO CORREGIDO
Response Espectrum Base Reactions

	F1 (kN)	F2 (kN)	Total (kN)	90% Vs (kN)
$V_{s(x)}$=	67.98	19.46	70.71	672.8
$V_{s(y)}$=	19.46	59.25	62.36	672.8

7.3 DISEÑO DE CIMENTACION

PROYECTO: INSTITUCION EDUCATIVA SIXTO MARIA- RAMPA

Elección de cargas y momentos para calculos de Esfuerzos y Áreas del Diseño de Cimentación

Combinaciones de carga — **NSR-10**

Cargas Gravitacionales: CIMEN= 1D + 1L — B.2.3-2

Cargas por Estado Limite de Servicio: CIMEN2= 1D + 0.75L + 0.70*(0.75/R)Ex + 0.21*(0.75/R)Ey; CIMEN3= 1D + 0.75L + 0.21*(0.75/R)Ex + 0.70*(0.75/R)Ey — B.2.3-8

Story	Point	Load	FX	FY	FZ	MX	MY	MZ	Load	Max (Mx:My)	COMBINACIÓN	Pumax
BASE	62	CIM1	0.400	-2.780	250.150	-3.268	84.670	-3.404	CIM1	84.67		
BASE	62	CIM2 MAX	29.430	1.120	227.680	7.873	182.269	2.469	CIM2 MAX	182.269		
BASE	62	CIM2 MIN	-28.690	-6.510	223.570	-13.041	-33.881	-8.330	CIM2 MIN	33.881	CIM1	250.15
BASE	62	CIM3 MAX	11.540	3.850	228.670	15.354	116.423	4.725	CIM3 MAX	116.423		
BASE	62	CIM3 MIN	-10.800	-9.240	222.580	-20.522	31.966	-10.585	CIM3 MIN	31.966		
BASE	64	CIM1	-1.060	-0.670	441.630	-67.460	10.330	-12.672	CIM1	67.46		
BASE	64	CIM2 MAX	20.820	12.640	396.280	-45.727	71.131	-6.454	CIM2 MAX	71.131		
BASE	64	CIM2 MIN	-22.730	-14.320	392.500	-73.942	-52.229	-15.967	CIM2 MIN	73.942	CIM1	441.63
BASE	64	CIM3 MAX	8.670	22.690	396.400	-36.132	35.821	-5.340	CIM3 MAX	36.132		
BASE	64	CIM3 MIN	-10.580	-24.380	392.380	-83.538	-16.919	-17.081	CIM3 MIN	83.538		
BASE	70	CIM1	0.540	4.460	401.330	-16.586	3.828	-7.513	CIM1	16.586		
BASE	70	CIM2 MAX	32.560	15.250	360.340	-0.682	69.208	-1.972	CIM2 MAX	69.208		
BASE	70	CIM2 MIN	-31.610	-7.810	356.360	-28.204	-62.408	-11.301	CIM2 MIN	62.408	CIM1	401.33
BASE	70	CIM3 MAX	21.500	22.040	360.240	8.612	44.795	-0.030	CIM3 MAX	44.795		
BASE	70	CIM3 MIN	-20.540	-14.610	356.470	-37.498	-37.995	-13.243	CIM3 MIN	37.995		
BASE	114	CIM1	0.32	-17.3	291.01	-3.485	11.106	-4.751	CIM1	11.106		
BASE	114	CIM2 MAX	27.63	-4.57	263.6	11.446	61.897	1.929	CIM2 MAX	61.897		
BASE	114	CIM2 MIN	-27.08	-24.38	257.16	-18.222	-42.291	-10.267	CIM2 MIN	42.291	CIM1	291.01
BASE	114	CIM3 MAX	29.53	2.24	265.58	21.356	63.805	4.374	CIM3 MAX	63.805		
BASE	114	CIM3 MIN	-28.97	-31.19	255.17	-28.133	-44.2	-12.712	CIM3 MIN	44.2		

DISEÑO VIGAS DE AMARRE

PROYECTO: INSTITUCIÓN EDUCATIVA SIXTO MARIA

VIGA DE AMARRE TIPO

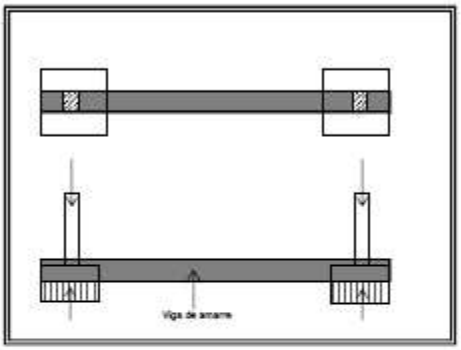
f'c = 21.1 MPa
fy = 420 MPa

b = 0.40 m
h = 0.40 m

Pmáx = 441.63 kN

De acuerdo a el numeral A.3.6.4.2
de la NSR-10 tenemos:

Aa = ***0.15***
Paxial = 0.25*Aa*Pmáx
Paxial = *16.6* kN



DISEÑO A TENSIÓN

As = 1.7*16.561125/(0.90*420)
As = 0.74 cm^2

DISEÑO A COMPRESIÓN

P com = 1.7*16.561125
P com = *28.2* kN

Para esta carga la sección requiere cuantía mínima:

As = 0.00333*0.4*0.35
As = 4.66 cm^2

Se suministra un refuerzo constituido por 4#4 arriba y abajo (como refuerzo mínimo).

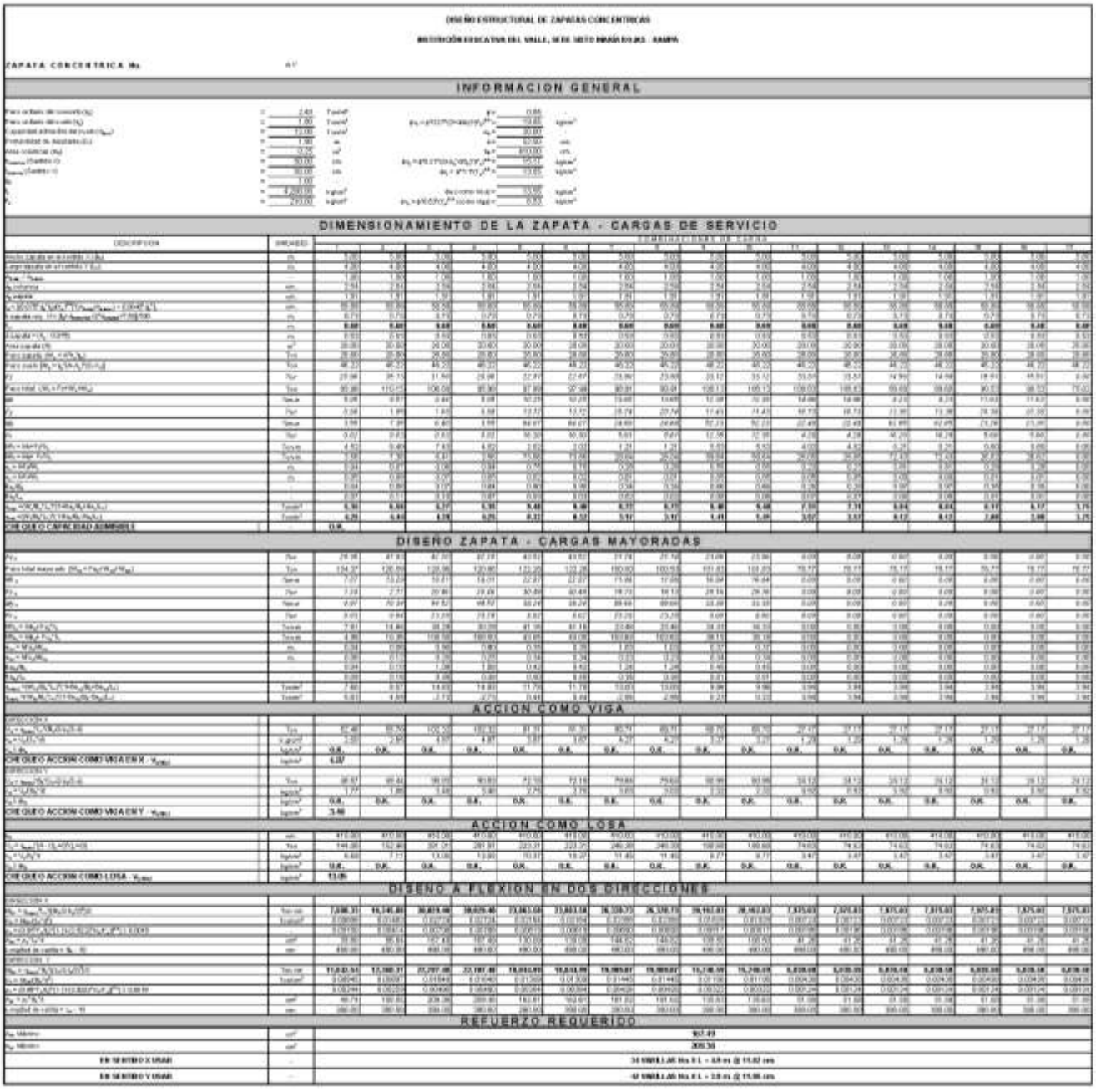
DISEÑO ESTRUCTURAL DE ZAPATAS CONCÉNTRICAS

INSTITUCIÓN EDUCATIVA DEL VALLE, SEDE SIXTO MARÍA ROJAS - RAMPA

RESUMEN DISEÑO

CARGA ADMISIBLE 12.00 Ton/m² VERTICALES
CARGA ADMISIBLE ± 15.96 Ton/m² SISMO

ZAPATA	B_x (m)	L_y (m)	H (m)	Q_{max} (Ton/m²) CARGA VERTICAL	Q_{max} (Ton/m²) SISMO	Q_{neu} (Ton/m²)	CHEQUEO	TIPO DE ZAPATA	REFUERZO EN X	REFUERZO EN Y
A-1	5.00	4.00	0.60	5.35	9.48	0.12	O.K.		34 VARILLAS No. 8 L = 4.9 m. @ 11.82 cm.	42 VARILLAS No. 8 L = 3.9 m. @ 11.95 cm.
A-2	4.80	3.00	0.60	5.64	9.25	0.95	O.K.		21 VARILLAS No. 8 L = 4.7 m. @ 14.5 cm.	34 VARILLAS No. 8 L = 2.9 m. @ 14.24 cm.
A-3	4.80	3.00	0.60	5.39	9.97	0.27	O.K.		23 VARILLAS No. 8 L = 4.7 m. @ 13.18 cm.	36 VARILLAS No. 8 L = 2.9 m. @ 13.43 cm.
A-4	4.80	3.00	0.60	5.08	9.36	0.45	O.K.		22 VARILLAS No. 8 L = 4.7 m. @ 13.81 cm.	35 VARILLAS No. 8 L = 2.9 m. @ 13.82 cm.



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

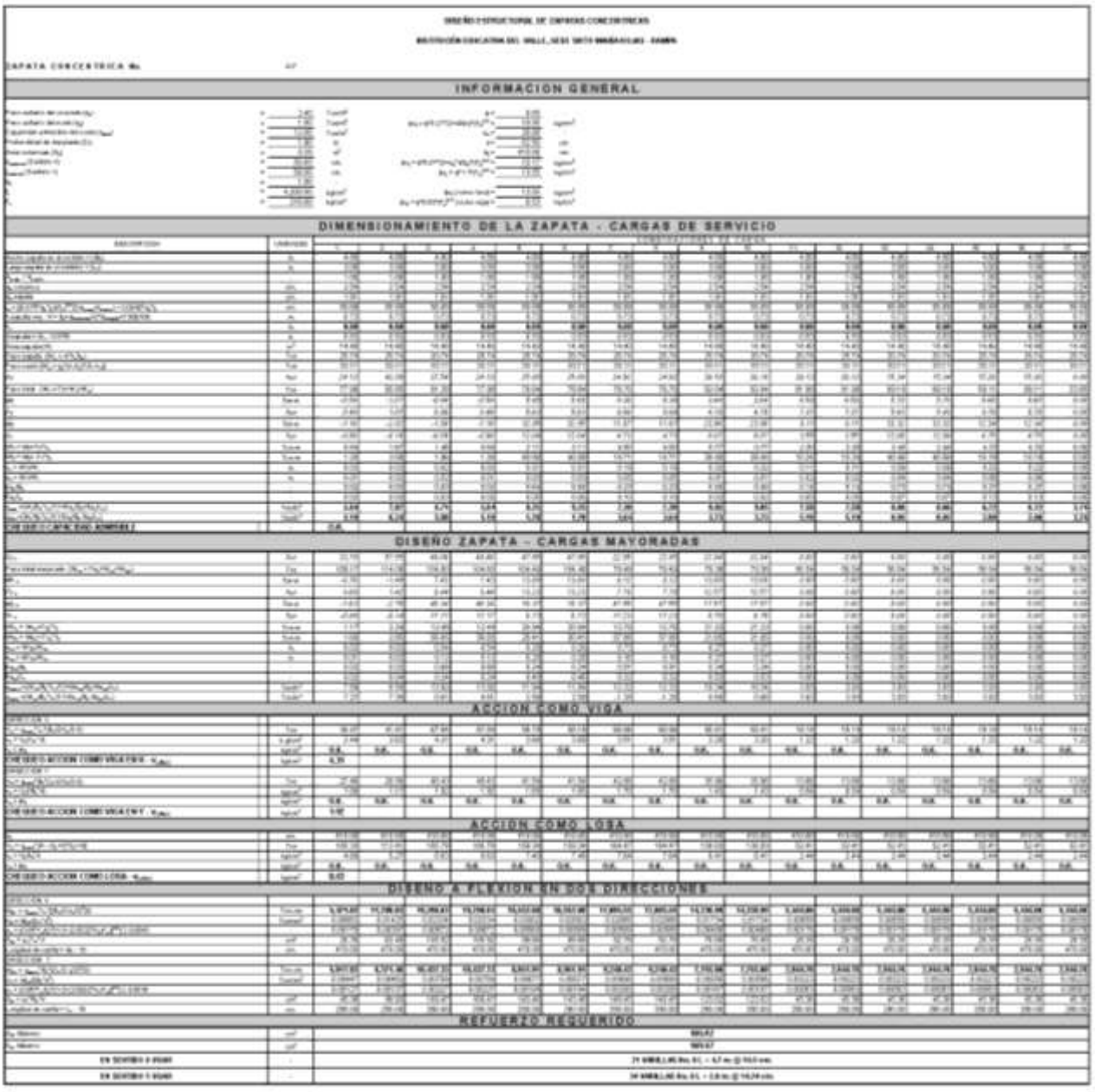
DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

DISEÑO ZAPATA - CARGAS MAYORADAS

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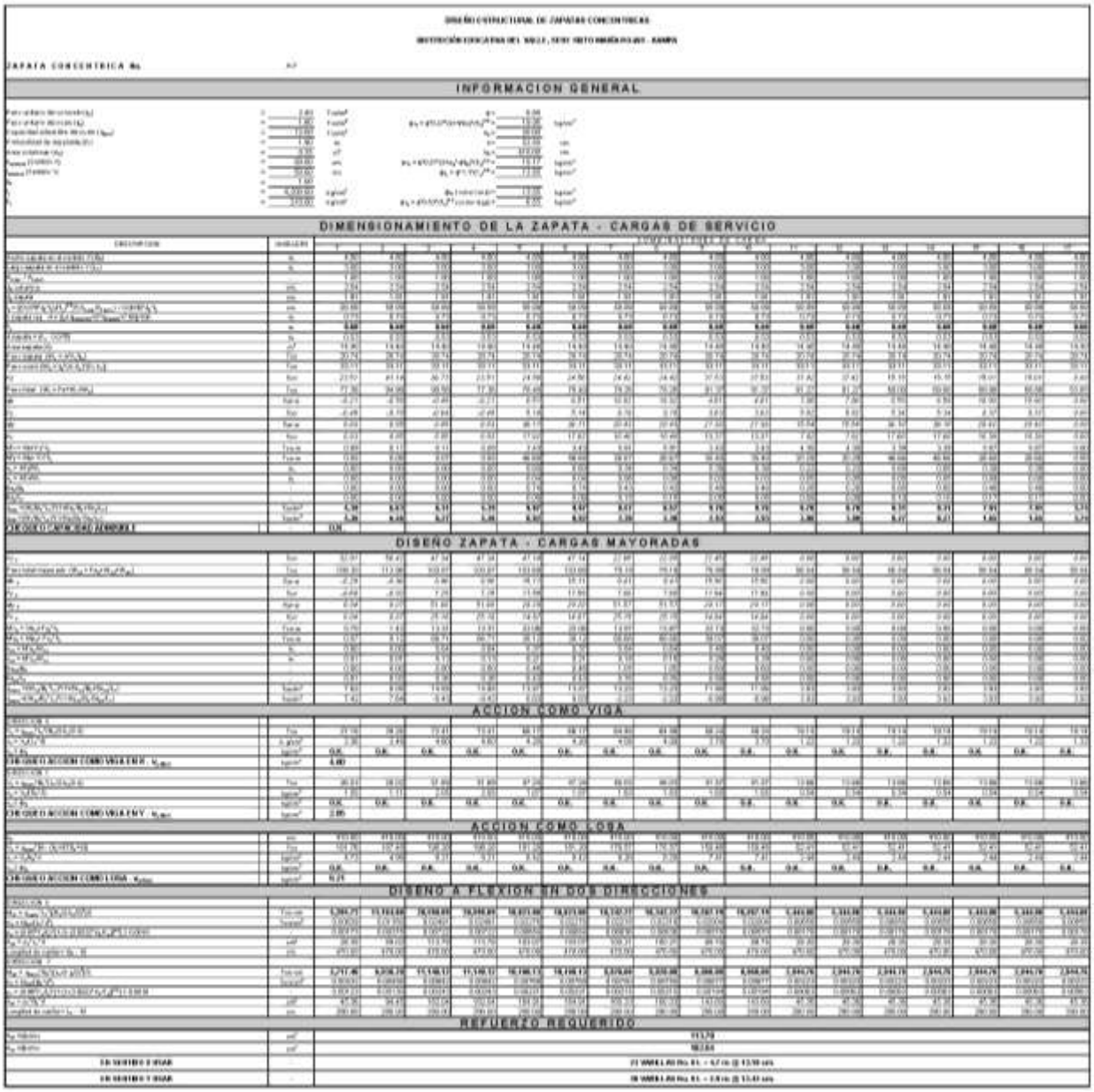
DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

DISEÑO ZAPATA - CARGAS MAYORADAS

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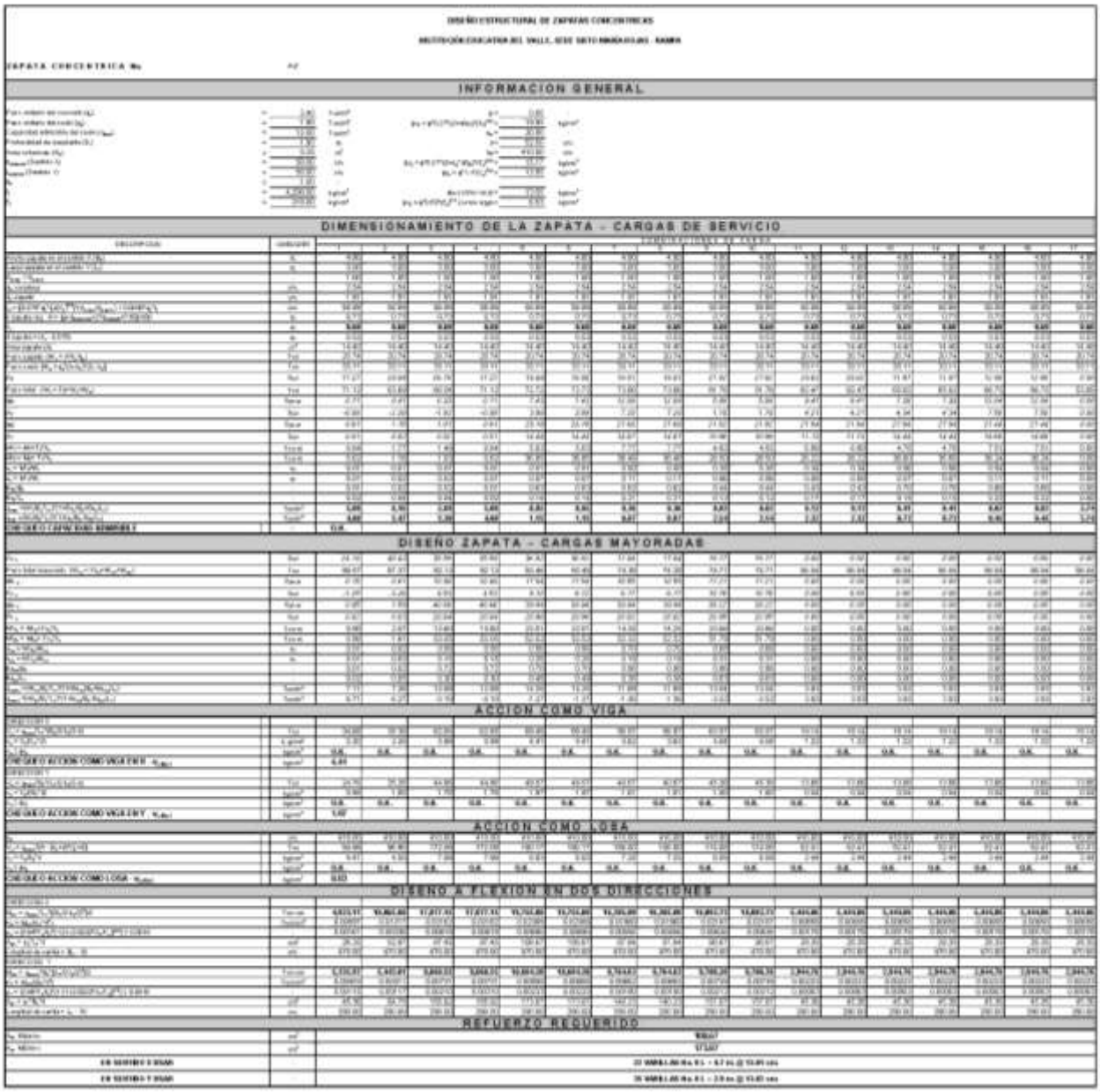
DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO



DISEÑO ESTRUCTURAL DE ZAPATAS CONCENTRICAS

INFORMACION GENERAL

DIMENSIONAMIENTO DE LA ZAPATA - CARGAS DE SERVICIO

DISEÑO ZAPATA - CARGAS MAYORADAS

ACCION COMO VIGA

ACCION COMO LOSA

DISEÑO A FLEXION EN DOS DIRECCIONES

REFUERZO REQUERIDO

7.4 DISEÑO DE VIGAS

VR-001/BASE

B=0.40 H=0.40 L=0.10			B=0.40 H=0.40 L=1.85		
Mu=-15.83 As=5.08 As(r)=4.57		Mu=-3.96 As=5.08 As(r)=4.57	Mu=-0.89 As=5.08 As(r)=4.57		Mu=-2.52 As=21.00 As(r)=4.57
	Mu=3.96 As=3.81 As(r)=4.57			Mu=3.00 As=5.08 As(r)=4.57	
Vu=-64.99	Vu=-64.27	Vu=-63.55	Vu=-6.38	Vu=2.10	Vu=7.86

VR-10/N+0.66

B=0.15 H=0.50 L=1.85		
Mu=-9.71 As=3.96 As(r)=2.21		Mu=-4.21 As=3.96 As(r)=2.21
	Mu=2.43 As=3.96 As(r)=2.21	
Vu=-5.99	Vu=-3.83	Vu=-1.67

VR-12/N+0.66

B=0.40 H=0.50 L=0.10			B=0.40 H=0.50 L=1.85		
Mu=-342.02 As=15.52 As(r)=24.13		Mu=-273.25 As=15.52 As(r)=18.99	Mu=-254.65 As=15.52 As(r)=17.01		Mu=-0.00 As=15.52 As(r)=5.89
	Mu=85.51 As=7.98 As(r)=5.89			Mu=0.00 As=7.62 As(r)=5.89	
Vu=-275.83	Vu=-275.11	Vu=-274.39	Vu=-136.75	Vu=-130.99	Vu=-125.23

VR-14/N+0.66

B=0.15 H=0.50 L=1.85		
Mu=-10.40 As=3.96 As(r)=2.21		Mu=-3.24 As=3.96 As(r)=2.21
	Mu=0.02 As=3.96 As(r)=2.21	
Vu=-6.36	Vu=-4.20	Vu=-2.04

VR-4/N+1.33

B=0.15 H=0.50 L=1.85		
Mu=-9.86 As=3.96 As(r)=2.21		Mu=-4.53 As=3.96 As(r)=2.21
	Mu=2.46 As=3.96 As(r)=2.21	
Vu=-6.03	Vu=-3.87	Vu=1.75

VR-6/N+1.33

B=0.40 H=0.50 L=0.10			B=0.40 H=0.50 L=1.85		
Mu=-331.21 As=15.52 As(r)=25.19		Mu=-264.71 As=15.52 As(r)=18.30	Mu=-246.67 As=15.52 As(r)=16.41		Mu=-0.00 As=15.52 As(r)=5.89
	Mu=82.80 As=7.98 As(r)=5.89			Mu=0.00 As=7.98 As(r)=5.89	
Vu=-266.70	Vu=-265.98	Vu=-265.26	Vu=-132.57	Vu=-126.81	Vu=-121.05

VR-8/N+1.33

B=0.15 H=0.50 L=1.85		
Mu=-9.28 As=3.96 As(r)=2.21		Mu=-4.44 As=3.96 As(r)=2.21
	Mu=2.32 As=3.96 As(r)=2.21	
Vu=-5.88	Vu=-3.72	Vu=1.83

VR-1/N+2.00

B=0.15 H=0.50 L=1.85			B=0.15 H=0.50 L=0.35			B=0.15 H=0.50 L=1.85		
Mu=-4.31 As=2.97 As(r)=2.21		Mu=-12.97 As=3.96 As(r)=2.21	Mu=-13.63 As=3.96 As(r)=2.21		Mu=-13.73 As=3.96 As(r)=2.21	Mu=-13.20 As=3.96 As(r)=2.21		Mu=-3.71 As=3.96 As(r)=2.21
	Mu=0.00 As=3.96 As(r)=2.21			Mu=3.43 As=3.96 As(r)=2.21			Mu=0.00 As=3.96 As(r)=2.21	
Vu=3.22	Vu=5.38	Vu=7.54	Vu=-2.35	Vu=-1.81	Vu=1.72	Vu=-7.56	Vu=-5.40	Vu=-3.24

VR-19/N+2.00

B=0.15 H=0.50 L=7.49			B=0.15 H=0.50 L=0.48			B=0.15 H=0.50 L=0.50		
Mu=-74.32 As=7.47 As(r)=4.82		Mu=-45.81 As=7.98 As(r)=2.86	Mu=-46.49 As=7.98 As(r)=3.12		Mu=-91.46 As=7.98 As(r)=6.07	Mu=-100.91 As=7.98 As(r)=6.80		Mu=-51.67 As=7.98 As(r)=3.56
	Mu=44.22 As=3.96 As(r)=2.76			Mu=22.87 As=3.96 As(r)=2.21			Mu=25.23 As=3.96 As(r)=2.21	
Vu=-58.11	Vu=-3.99	Vu=50.68	Vu=55.95	Vu=61.30	Vu=66.64	Vu=-71.00	Vu=-65.66	Vu=-60.53

B=0.15 H=0.50 L=7.32			B=0.15 H=0.50 L=0.47			B=0.15 H=0.50 L=0.50		
Mu=-51.54 As =7.76 As(r)=3.24		Mu=-47.65 As =7.76 As(r)=2.98	Mu=-47.91 As =7.76 As(r)=3.28		Mu=-94.08 As =7.76 As(r)=6.27	Mu=-93.31 As =7.76 As(r)=6.21		Mu=-43.56 As =7.76 As(r)=3.02
	Mu=48.54 As =3.96 As(r)=3.04			Mu=23.52 As =3.96 As(r)=2.21			Mu=23.33 As =3.96 As(r)=2.21	
Vu=-53.28	Vu=-2.63	Vu=52.24	Vu=57.68	Vu=61.90	Vu=66.90	Vu=-71.30	Vu=-67.09	Vu=-62.87

B=0.15 H=0.50 L=6.97			B=0.15 H=0.50 L=2.10		
Mu=-43.75 As =7.76 As(r)=2.73		Mu=-66.22 As =5.70 As(r)=4.24	Mu=-55.92 As =5.70 As(r)=3.54		Mu=-0.00 As =5.70 As(r)=2.21
	Mu=38.00 As =3.96 As(r)=2.35			Mu=0.00 As =3.96 As(r)=2.21	
Vu=-47.36	Vu=6.44	Vu=53.17	Vu=-45.54	Vu=-26.11	Vu=-8.23

VR-2/N+2.00

B=0.40 H=0.50 L=1.85			B=0.40 H=0.50 L=0.10			B=0.40 H=0.50 L=0.10		
Mu=-1.22 As =11.64 As(r)=5.89		Mu=-181.69 As =15.52 As(r)=11.68	Mu=-183.70 As =15.52 As(r)=12.16		Mu=-232.48 As =15.52 As(r)=15.34	Mu=-217.52 As =15.52 As(r)=14.24		Mu=-170.16 As =15.52 As(r)=11.20
	Mu=0.00 As =7.92 As(r)=5.89			Mu=58.12 As =7.92 As(r)=5.89			Mu=54.38 As =7.92 As(r)=5.89	
Vu=85.97	Vu=91.73	Vu=97.49	Vu=194.42	Vu=195.14	Vu=195.86	Vu=-190.18	Vu=-189.46	Vu=-188.74

B=0.40 H=0.50 L=1.85		
Mu=-169.52 As =15.52 As(r)=10.83		Mu=-0.01 As =15.52 As(r)=5.89
	Mu=0.00 As =7.92 As(r)=5.89	
Vu=-91.92	Vu=-86.16	Vu=-80.40

VR-20/N+2.00

B=0.15 H=0.50 L=7.49			B=0.15 H=0.50 L=0.48			B=0.15 H=0.50 L=0.50		
Mu=-54.22 As =1.42 As(r)=3.42		Mu=-49.31 As =5.70 As(r)=3.09	Mu=-48.50 As =5.70 As(r)=3.30		Mu=-89.85 As =5.70 As(r)=5.95	Mu=-93.95 As =5.70 As(r)=6.26		Mu=-53.83 As =5.70 As(r)=3.63
	Mu=53.23 As =3.96 As(r)=3.36			Mu=22.46 As =3.96 As(r)=2.21			Mu=23.49 As =3.96 As(r)=2.21	
Vu=-55.22	Vu=-3.32	Vu=53.57	Vu=53.93	Vu=58.15	Vu=62.37	Vu=-64.36	Vu=-59.02	Vu=-54.76

B=0.15 H=0.50 L=7.32			B=0.15 H=0.50 L=0.47			B=0.15 H=0.50 L=0.50		
Mu=-54.87 As=3.96 As(r)=3.47		Mu=-54.33 As=3.96 As(r)=3.43	Mu=-53.40 As=3.96 As(r)=3.58		Mu=-89.83 As=5.70 As(r)=5.95	Mu=-87.91 As=5.70 As(r)=5.81		Mu=-51.29 As=3.96 As(r)=3.44
	Mu=49.43 As=3.96 As(r)=3.10			Mu=22.46 As=3.96 As(r)=2.21			Mu=21.98 As=3.96 As(r)=2.21	
Vu=-53.06	Vu=-4.56	Vu=52.46	Vu=52.42	Vu=56.64	Vu=61.03	Vu=-60.02	Vu=-55.19	Vu=-50.97

B=0.15 H=0.50 L=6.97			B=0.15 H=0.50 L=2.10		
Mu=-51.80 As=3.96 As(r)=3.26		Mu=-61.22 As=3.96 As(r)=3.90	Mu=-33.65 As=3.96 As(r)=2.21		Mu=-3.13 As=3.96 As(r)=2.21
	Mu=40.96 As=3.96 As(r)=2.54			Mu=0.00 As=3.96 As(r)=2.21	
Vu=-48.82	Vu=6.37	Vu=51.71	Vu=-29.82	Vu=-13.79	Vu=3.24

VR-3/N+2.66

B=0.15 H=0.50 L=1.85		
Mu=-4.49 As=3.96 As(r)=2.21		Mu=-10.14 As=3.96 As(r)=2.21
	Mu=0.00 As=3.96 As(r)=2.21	
Vu=1.97	Vu=4.13	Vu=6.29

VR-5/N+2.66

B=0.40 H=0.50 L=1.85			B=0.40 H=0.50 L=0.10		
Mu=-0.00 As=11.64 As(r)=5.89		Mu=-245.42 As=16.56 As(r)=16.31	Mu=-263.33 As=15.64 As(r)=18.20		Mu=-330.01 As=17.56 As(r)=23.09
	Mu=0.00 As=7.97 As(r)=5.89			Mu=82.50 As=7.97 As(r)=5.89	
Vu=120.42	Vu=126.18	Vu=131.94	Vu=266.00	Vu=266.72	Vu=267.44

VR-7/N+2.66

B=0.15 H=0.50 L=1.85		
Mu=-6.01 As=3.96 As(r)=2.21		Mu=-8.82 As=3.96 As(r)=2.21
	Mu=2.20 As=3.96 As(r)=2.21	
Vu=-3.05	Vu=4.47	Vu=6.63

VR-11/N+3.33

B=0.40 H=0.50 L=1.85			B=0.40 H=0.50 L=0.10		
Mu=-0.00 As=11.49 As(r)=5.89		Mu=-237.07 As=15.49 As(r)=15.68	Mu=-253.72 As=15.49 As(r)=17.45		Mu=-319.69 As=15.49 As(r)=22.22
	Mu=0.00 As=7.97 As(r)=5.89			Mu=79.92 As=7.97 As(r)=5.89	
Vu=116.42	Vu=122.18	Vu=127.94	Vu=263.14	Vu=263.86	Vu=264.58

VR-13/N+3.33

B=0.15 H=0.50 L=1.85		
Mu=-6.08 As=3.96 As(r)=2.21		Mu=-11.13 As=3.96 As(r)=2.21
	Mu=2.78 As=3.96 As(r)=2.21	
Vu=4.78	Vu=6.94	Vu=9.10

VR-9/N+3.33

B=0.15 H=0.50 L=1.85		
Mu=-4.42 As=3.96 As(r)=2.21		Mu=-10.13 As=3.96 As(r)=2.21
	Mu=2.63 As=3.96 As(r)=2.21	
Vu=3.00	Vu=5.16	Vu=7.32

VR-15/N+4.00

B=0.40 H=0.50 L=1.85			B=0.40 H=0.50 L=0.10			B=0.40 H=0.50 L=2.37		
Mu=-2.03 As=15.49 As(r)=5.89		Mu=-199.34 As=15.49 As(r)=12.93	Mu=-203.22 As=15.49 As(r)=13.57		Mu=-254.85 As=15.49 As(r)=17.03	Mu=-134.95 As=15.49 As(r)=8.48		Mu=-0.93 As=15.49 As(r)=5.89
	Mu=0.00 As=7.97 As(r)=5.89			Mu=63.71 As=7.97 As(r)=5.89			Mu=0.00 As=7.97 As(r)=5.89	
Vu=94.11	Vu=99.87	Vu=105.63	Vu=251.67	Vu=252.39	Vu=253.11	Vu=-57.56	Vu=-49.79	Vu=-42.01

VR-16/N+4.00

B=0.15 H=0.50 L=1.85			B=0.15 H=0.50 L=2.80		
Mu=-7.89 As=2.97 As(r)=2.21		Mu=-15.46 As=3.96 As(r)=2.21	Mu=-17.64 As=3.96 As(r)=2.21		Mu=-0.45 As=3.96 As(r)=2.21
	Mu=0.00 As=3.96 As(r)=2.21			Mu=0.09 As=3.96 As(r)=2.21	
Vu=3.94	Vu=6.10	Vu=8.26	Vu=-9.34	Vu=-6.16	Vu=-2.97

VR-17/N+4.00

B=0.15 H=0.50 L=2.10			B=0.15 H=0.50 L=7.52			B=0.15 H=0.50 L=0.48		
Mu=-6.60 As=7.76 As(r)=2.21		Mu=-40.31 As=7.76 As(r)=2.50	Mu=-106.71 As=7.76 As(r)=7.26		Mu=-66.35 As=7.76 As(r)=4.25	Mu=-61.21 As=7.76 As(r)=4.32		Mu=-107.84 As=7.76 As(r)=7.35
	Mu=0.06 As=3.96 As(r)=2.21			Mu=45.65 As=3.96 As(r)=2.88			Mu=26.96 As=3.96 As(r)=2.21	
Vu=-3.94	Vu=14.99	Vu=30.76	Vu=60.47	Vu=15.38	Vu=-48.38	Vu=59.26	Vu=63.48	Vu=67.70

B=0.15 H=0.50 L=0.47			B=0.15 H=0.50 L=7.29			B=0.15 H=0.50 L=0.47		
Mu=-95.48 As=7.76 As(r)=6.38		Mu=-60.14 As=7.76 As(r)=4.04	Mu=-60.23 As=7.76 As(r)=3.83		Mu=-66.86 As=7.76 As(r)=4.29	Mu=-63.92 As=7.76 As(r)=4.35		Mu=-105.70 As=7.76 As(r)=7.17
	Mu=23.87 As=3.96 As(r)=2.21			Mu=52.73 As=3.96 As(r)=3.32			Mu=26.42 As=3.96 As(r)=2.21	
Vu=-59.16	Vu=-54.54	Vu=-50.32	Vu=50.98	Vu=-8.76	Vu=-54.54	Vu=55.66	Vu=60.43	Vu=65.78

B=0.15 H=0.50 L=0.47			B=0.15 H=0.50 L=6.82			B=0.15 H=0.50 L=1.98		
Mu=-85.23 As=7.76 As(r)=5.61		Mu=-51.16 As=7.76 As(r)=3.42	Mu=-50.35 As=7.76 As(r)=3.16		Mu=-72.90 As=7.76 As(r)=4.71	Mu=-35.34 As=7.76 As(r)=2.21		Mu=-3.58 As=7.76 As(r)=2.21
	Mu=21.31 As=3.96 As(r)=2.21			Mu=38.26 As=3.96 As(r)=2.37			Mu=0.12 As=3.96 As(r)=2.21	
Vu=-54.64	Vu=-49.88	Vu=-45.66	Vu=46.68	Vu=-8.88	Vu=-53.85	Vu=-30.31	Vu=-14.28	Vu=3.22

VR-18/N+4.00

B=0.15 H=0.50 L=2.10			B=0.15 H=0.50 L=7.52			B=0.15 H=0.50 L=0.48		
Mu=-0.00 As=7.76 As(r)=2.21		Mu=-109.43 As=7.76 As(r)=7.47	Mu=-93.06 As=7.76 As(r)=6.19		Mu=-44.67 As=7.76 As(r)=2.79	Mu=-44.16 As=7.76 As(r)=3.07		Mu=-98.29 As=7.76 As(r)=6.59
	Mu=0.00 As=3.96 As(r)=2.21			Mu=40.27 As=3.96 As(r)=2.50			Mu=24.67 As=3.96 As(r)=2.21	
Vu=17.33	Vu=51.05	Vu=87.15	Vu=60.82	Vu=9.71	Vu=-47.97	Vu=70.25	Vu=74.47	Vu=78.69

B=0.15 H=0.50 L=0.47			B=0.15 H=0.50 L=7.29			B=0.15 H=0.50 L=0.47		
Mu=-103.19 As=7.76 As(r)=6.98		Mu=-50.60 As=7.76 As(r)=3.48	Mu=-50.94 As=7.76 As(r)=3.20		Mu=-45.71 As=7.76 As(r)=2.85	Mu=-47.37 As=7.76 As(r)=3.25		Mu=-98.19 As=7.76 As(r)=6.59
	Mu=25.80 As=3.96 As(r)=2.21			Mu=49.81 As=3.96 As(r)=3.13			Mu=24.55 As=3.96 As(r)=2.21	
Vu=-78.27	Vu=-74.05	Vu=-69.84	Vu=53.46	Vu=2.86	Vu=-52.06	Vu=67.64	Vu=71.86	Vu=76.08

B=0.15 H=0.50 L=0.47			B=0.15 H=0.50 L=6.82			B=0.15 H=0.50 L=1.98		
Mu=-92.43 As=-7.76 As(r)=-6.15		Mu=-44.94 As=-7.76 As(r)=-3.09	Mu=-45.89 As=-7.76 As(r)=-2.87		Mu=-66.78 As=-5.70 As(r)=-4.28	Mu=-56.54 As=-5.70 As(r)=-3.58		Mu=-0.00 As=-5.70 As(r)=-2.21
	Mu=23.11 As=-3.96 As(r)=2.21			Mu=37.01 As=-3.96 As(r)=2.29			Mu=0.00 As=-3.96 As(r)=2.21	
Vu=-69.94	Vu=-65.72	Vu=-61.50	Vu=47.69	Vu=-6.35	Vu=-52.84	Vu=-45.89	Vu=-26.46	Vu=-7.81

VR-21/N+4.00

B=0.15 H=0.50 L=1.98		
Mu=-0.56 As=-3.96 As(r)=-2.21		Mu=-42.90 As=-3.96 As(r)=-2.67
	Mu=0.00 As=-3.96 As(r)=2.21	
Vu=-2.97	Vu=19.52	Vu=42.01

VR-002/BASE

B=0.40 H=0.40 L=7.31			B=0.40 H=0.40 L=8.41			B=0.40 H=0.40 L=7.89		
Mu=-15.83 As=-5.08 As(r)=-4.57		Mu=-3.96 As=-5.08 As(r)=-4.57	Mu=-15.83 As=-5.08 As(r)=-4.57		Mu=-3.96 As=-5.08 As(r)=-4.57	Mu=-15.83 As=-5.08 As(r)=-4.57		Mu=-3.96 As=-5.08 As(r)=-4.57
	Mu=3.96 As=-5.08 As(r)=4.57			Mu=3.96 As=-5.08 As(r)=4.57			Mu=3.96 As=-5.08 As(r)=4.57	
Vu=-64.99	Vu=2.10	Vu=7.86	Vu=-64.99	Vu=2.10	Vu=7.86	Vu=-64.99	Vu=2.10	Vu=7.86

Columna A-1'

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N+4.00					-219.76	-59.60				16/#8 (3.2%)	1.02	1.79	
	3.50	.50	.50	.50			-295.20	223.86	49.03				
		1.00			-923.72	-69.50				16/#8 (3.2%)	1.75	5.09	

Columna A-2'

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N+3.33					-308.58	-29.01				16/#7 (2.5%)	1.02	2.23	
	2.17	.50	.50	.50			-247.80	158.13	74.53				
					-627.25	-73.68				16/#7 (2.5%)	1.46		
N+0.66					368.43	42.31				16/#7 (2.5%)	0.97	4.54	
	.16	.50	.50	.50			-201.16	167.38	127.44				
		1.00			477.59	77.98				16/#7 (2.5%)	1.14		

Columna A-3'

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N+2.66					-301.62	-55.80				20/#7 #8 (3.5%)	0.70	2.90	
	.83	.50	.50	.50			-238.65	179.23	95.32				
					-471.38	-42.33				20/#7 #8 (3.5%)	0.86		
N+1.33					-212.94	-37.72				20/#7 #8 (3.5%)	0.75	5.84	
	.83	.50	.50	.50			-463.92	242.21	126.84				
		1.00			-496.29	-98.48				20/#7 #8 (3.5%)	0.98		

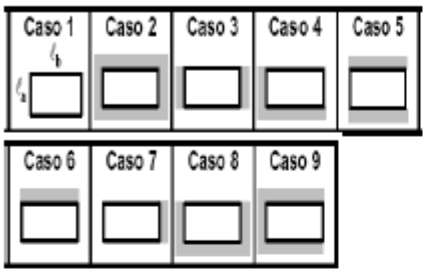
Columna A-4'

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N+2.00					-55.98	-99.74				20/#7 (3.1%)	0.48	1.69	
	1.50	.50	.50	.50			-361.38	201.59	135.11				
		1.00			-384.39	-160.33				20/#7 (3.1%)	0.95		

7.5 DISEÑO DE ELEMENTOS COMPLEMENTARIOS

PROYECTO: INSTITUCION EDUCATIVA SIXTO MARIA - RAMPA
DISEÑO PLACA MACIZA (EN UNA DIRECCION)

El diseño de la placa maciza se realiza de acuerdo con lo establecido en C.13.9 de las NSR - 10



Geometría de la losa

la =	2.00	m	fy =	420	MPa
lb =	6.90	m	f'c =	21	MPa

Relación m = **0.29**

h = l/20 (0.4+Fy/700) = 0.10 m

Espesor escogido: 0.10 m

Teniendo en cuenta que la relación m es menor de 0.5, la placa maciza trabaja en una dirección

Cargas

Peso propio de la losa	0.1x1.0x24	2.40	kN/m²
Impermeabilización	0.05x20	1.00	kN/m²
Carga Muerta Total		3.40	kN/m²
Carga Viva		5.00	kN/m²
Carga Última		12.08	kN/m²

DISEÑO A MOMENTO FLECTOR

Mu_a =	6.04	kN.m	*Cuantía:*	0.0030	*As =*	3.04 cm²/m ***Transversal***
			Cuantía:	0.0018	*As =*	1.80 cm²/m ***Longitudinal***

Distribución de refuerzo:

Colocar 1#3 c/.20 Transversalmente superior e inferior
Colocar 1#3 c/.20 Longitudinalmente superior e inferior

REVISIÓN A CORTANTE

R= 12.08 **kN**

ϕvc =	0.573	MPa	
ϕvu =	0.173	MPa	OK

7.6 ANEXOS DE COMPUTADOR

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S T O R Y D A T A

STORY	SIMILAR TO	HEIGHT	ELEVATION
N+4.00	None	0.670	4.000
N+3.33	None	0.670	3.330
N+2.66	None	0.660	2.660
N+2.00	None	0.670	2.000
N+1.33	None	0.670	1.330
N+0.66	None	0.660	0.660
BASE	None		0.000

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P O I N T C O O R D I N A T E S

POINT	X	Y	DZ-BELOW
62	2.250	0.000	0.000
63	4.500	0.000	0.000
64	2.250	8.390	0.000
65	4.500	8.390	0.000
67	4.500	9.140	0.000
69	4.500	7.640	0.000
70	2.250	17.300	0.000
71	4.500	17.300	0.000
73	4.500	18.050	0.000
75	4.500	16.550	0.000
77	4.500	25.110	0.000
78	0.000	25.110	0.000
80	4.500	27.360	0.000
81	0.000	27.360	0.000
82	0.000	17.300	0.000
83	0.000	18.050	0.000
84	0.000	16.550	0.000
85	0.000	8.390	0.000
86	0.000	7.640	0.000
87	0.000	9.140	0.000
88	0.000	0.000	0.000
90	4.950	0.000	0.000
91	0.000	-2.250	0.000
94	4.950	-2.250	0.000
95	2.500	0.000	0.000
96	2.500	7.640	0.000
97	2.500	8.390	0.000
98	2.500	9.140	0.000
99	2.500	16.550	0.000
100	2.500	17.300	0.000
101	2.500	18.050	0.000
102	2.500	25.110	0.000
103	2.500	27.360	0.000
104	2.000	25.110	0.000
105	2.000	27.360	0.000
106	2.000	-2.250	0.000
107	2.000	0.000	0.000
108	2.000	7.640	0.000
109	2.000	8.390	0.000
110	2.000	9.140	0.000
111	2.000	16.550	0.000
112	2.000	17.300	0.000
113	2.000	18.050	0.000

B79	99	100
B80	100	101
B81	102	103
B82	104	105
B83	106	107
B84	108	109
B85	109	110
B86	111	112
B87	112	113
B103	95	63
B104	64	97
B105	97	65
B107	98	67
B109	96	69
B110	70	100
B111	100	71
B113	101	73
B115	99	75
B116	78	104
B118	102	77
B119	81	105
B120	105	103
B121	103	80
B122	82	112
B123	112	70
B124	83	113
B126	84	111
B128	85	109
B129	109	64
B130	87	110
B132	86	108
B134	88	107
B136	91	106
B137	106	94
B138	107	62
B139	62	90
B140	104	114
B141	114	102
B142	62	95

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B R A C E C O N N E C T I V I T Y D A T A

BRACE	I END PT	J END PT	I END STORY
D14	63	69	Below
D15	67	75	Below
D16	73	77	Below
D17	86	88	Below
D19	78	83	Below
D26	95	96	Below
D27	98	99	Below
D28	101	102	Below
D29	108	107	Below
D30	111	110	Below
D31	104	113	Below
D32	84	87	Below

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

MATERIAL	MATERIAL	DESIGN	MATERIAL	MODULUS OF	POISSON'S	THERMAL	SHEAR

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

MATERIAL NAME	MASS PER UNIT VOL	WEIGHT PER UNIT VOL
STEEL	7.8271E+00	7.6820E+01
CONC21	2.4000E+00	2.4000E+01
OTHER	7.8271E+00	7.6820E+01
RAMPA	2.4000E+00	0.0000E+00

M A T E R I A L D E S I G N D A T A F O R S T E E L M A T E R I A L S

MATERIAL NAME	STEEL FY	STEEL FU	STEEL COST ($)
STEEL	344737.894	448159.263	271447.16

M A T E R I A L D E S I G N D A T A F O R C O N C R E T E M A T E R I A L S

MATERIAL NAME	LIGHTWEIGHT CONCRETE	CONCRETE FC	REBAR FY	REBAR FYS	LIGHTWT REDUC FACT
CONC21	No	21000.000	420000.000	420000.000	N/A
RAMPA	No	21000.000	420000.000	420000.000	N/A

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	MATERIAL NAME	SECTION SHAPE NAME OR NAME IN SECTION DATABASE FILE	CONC COL	CONC BEAM
VIG15X50	CONC21	Rectangular		Yes
VIG40X50	CONC21	Rectangular		Yes
COL50X50	CONC21	Rectangular	Yes	

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	SECTION DEPTH	FLANGE WIDTH TOP	FLANGE THICK TOP	WEB THICK	FLANGE WIDTH BOT	FLANGE THICK BOT
VIG15X50	0.5000	0.1500	0.0000	0.0000	0.0000	0.0000
VIG40X50	0.5000	0.4000	0.0000	0.0000	0.0000	0.0000
COL50X50	0.5000	0.5000	0.0000	0.0000	0.0000	0.0000

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	SECTION AREA	TORSIONAL CONSTANT	MOMENTS OF INERTIA I33	MOMENTS OF INERTIA I22	SHEAR AREAS A2	SHEAR AREAS A3
VIG15X50	0.0750	0.0005	0.0016	0.0001	0.0625	0.0625
VIG40X50	0.2000	0.0055	0.0042	0.0027	0.1667	0.1667
COL50X50	0.2500	0.0088	0.0052	0.0052	0.2083	0.2083

F R A M E S E C T I O N P R O P E R T Y D A T A

FRAME SECTION NAME	SECTION MODULI S33	SECTION MODULI S22	PLASTIC MODULI Z33	PLASTIC MODULI Z22	RADIUS OF GYRATION R33	RADIUS OF GYRATION R22
VIG15X50	0.0063	0.0019	0.0094	0.0028	0.1443	0.0433
VIG40X50	0.0167	0.0133	0.0250	0.0200	0.1443	0.1155
COL50X50	0.0208	0.0208	0.0313	0.0313	0.1443	0.1443

F R A M E S E C T I O N W E I G H T S A N D M A S S E S

VIG15X50	255.6027	25.5603
VIG40X50	99.3600	9.9360
COL50X50	71.9400	7.1940

C O N C R E T E C O L U M N D A T A

FRAME SECTION NAME	REINF CONFIGURATION LONGIT	LATERAL	REINF SIZE/TYPE	NUM BARS 3DIR/2DIR	NUM BARS CIRCULAR	BAR COVER
COL50X50	Rectangular	Ties	#8/Design	5/5	N/A	0.0500

C O N C R E T E B E A M D A T A

FRAME SECTION NAME	TOP COVER	BOT COVER	TOP LEFT AREA	TOP RIGHT AREA	BOT LEFT AREA	BOT RIGHT AREA
VIG15X50	0.0500	0.0500	0.000	0.000	0.000	0.000
VIG40X50	0.0500	0.0500	0.000	0.000	0.000	0.000

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S H E L L S E C T I O N P R O P E R T Y D A T A

SHELL SECTION	MATERIAL NAME	SHELL TYPE	LOAD DIST ONE WAY	MEMBRANE THICK	BENDING THICK	TOTAL WEIGHT	TOTAL MASS
PLACAMACIZA	CONC21	Membrane	Yes	0.1420	0.1420	113.3586	11.3359
RAMPA	RAMPA	Membrane	No	0.1420	0.1420	0.0000	0.0000

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S T A T I C L O A D C A S E S

STATIC CASE	CASE TYPE	AUTO LAT LOAD	SELF WT MULTIPLIER	NOTIONAL FACTOR	NOTIONAL DIRECTION
DEAD	DEAD	N/A	1.0000		
LIVE	LIVE	N/A	0.0000		

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R E S P O N S E S P E C T R U M C A S E S

RESP SPEC CASE: SISDERX

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	DERIVAS	25.9600
U2	----	N/A
U3	----	N/A

RESP SPEC CASE: SISDERY

BASIC RESPONSE SPECTRUM DATA

U1	----	N/A
U2	DERIVAS	22.8700
U3	----	N/A

RESP SPEC CASE: SISDISX

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	DISENO	25.9600
U2	----	N/A
U3	----	N/A

RESP SPEC CASE: SISDISY

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	DISENO	22.8700
U3	----	N/A

RESP SPEC CASE: SISUMEX

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	UMBRAL	9.8100
U2	----	N/A
U3	----	N/A

RESP SPEC CASE: SISUMEY

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0500	0.0000	0.0500

L O A D I N G C O M B I N A T I O N S

COMBO	COMBO TYPE	CASE	CASE TYPE	SCALE FACTOR
COMDIS1	ADD	DEAD	Static	1.4000
COMDIS2	ADD	DEAD	Static	1.2000
		LIVE	Static	1.6000
COMDIS3	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISDISX	Spectra	1.0000
		SISDISY	Spectra	0.3000
COMDIS4	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISDISY	Spectra	1.0000
		SISDISX	Spectra	0.3000
COMDIS5	ADD	DEAD	Static	0.9000
		SISDISX	Spectra	1.0000
		SISDISY	Spectra	0.3000
COMDIS6	ADD	DEAD	Static	0.9000
		SISDISY	Spectra	1.0000
		SISDISX	Spectra	0.3000
ENVOLVENTE	ENVE	COMDIS1	Combo	1.0000
		COMDIS2	Combo	1.0000
		COMDIS3	Combo	1.0000
		COMDIS4	Combo	1.0000
		COMDIS5	Combo	1.0000
		COMDIS6	Combo	1.0000
CIM1	ADD	DEAD	Static	1.0000
		LIVE	Static	1.0000
CIM2	ADD	DEAD	Static	1.0000
		LIVE	Static	0.7500
		SISDISX	Spectra	0.3500
		SISDISY	Spectra	0.1166
CIM3	ADD	DEAD	Static	1.0000
		LIVE	Static	0.7500
		SISDISY	Spectra	0.3500
		SISDISX	Spectra	0.1166
COMDER1	ADD	SISDERX	Spectra	1.0000
		SISDERY	Spectra	0.3000
COMDER2	ADD	SISDERY	Spectra	1.0000
		SISDERX	Spectra	0.3000
COMDERUMB1	ADD	SISUMBX	Spectra	1.0000
		SISUMBY	Spectra	0.3000
COMDERUMB2	ADD	SISUMBY	Spectra	1.0000
		SISUMBX	Spectra	0.3000

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R E S P O N S E S P E C T R U M F U N C T I O N - F R O M F I L E

FUNCTION NAME: DERIVAS

FILE NAME: c:\users\diseños y estructura\desktop\ing. daniel rojas\dye16-2282-i.e sixto maria\rampa\memorias\derivas.txt
DATA TYPE: Period vs Acceleration
NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	1.1330
0.0520	1.1330
0.1030	1.1330
0.1550	1.1330
0.2070	1.1330
0.4030	1.1330
0.6000	1.1330
0.7970	1.1330

```
          4.7860      0.2350
          5.1310      0.2190
          5.4760      0.2050
          5.8210      0.1930
          6.1660      0.1820
          6.5100      0.1730
          6.8550      0.1640
          7.2000      0.1560
          8.2000      0.1200
          9.2000      0.0960


  FUNCTION NAME: DISENO

    FILE NAME: c:\users\diseños y estructura\desktop\ing. daniel rojas\dye16-2282-i.e sixto
maria\rampa\memorias\diseño.txt
    DATA TYPE: Period vs Acceleration
    NUMBER OF HEADER LINES = 0

          PERIOD       ACCEL

          0.0000      0.7550
          0.0520      0.7550
          0.1030      0.7550
          0.1550      0.7550
          0.2070      0.7550
          0.4030      0.7550
          0.6000      0.7550
          0.7970      0.7550
          0.9930      0.7550
          1.3380      0.5610
          1.6830      0.4460
          2.0280      0.3700
          2.3720      0.3160
          2.7170      0.2760
          3.0620      0.2450
          3.4070      0.2200
          3.7520      0.2000
          4.0970      0.1830
          4.4410      0.1690
          4.7860      0.1570
          5.1310      0.1460
          5.4760      0.1370
          5.8210      0.1290
          6.1660      0.1220
          6.5100      0.1150
          6.8550      0.1090
          7.2000      0.1040
          8.2000      0.0800
          9.2000      0.0640


  FUNCTION NAME: UMBRAL

    FILE NAME: c:\users\diseños y estructura\desktop\ing. daniel rojas\dye16-2282-i.e sixto
maria\rampa\memorias\umbral.txt
    DATA TYPE: Period vs Acceleration
    NUMBER OF HEADER LINES = 0

          PERIOD       ACCEL

          0.0000      0.0900
          0.0500      0.1260
          0.1000      0.1620
          0.1500      0.1980
          0.2000      0.2340
          0.2500      0.2700
          0.4920      0.2700
```

5.1560	0.1150
5.7500	0.1030
6.3440	0.0930
6.9380	0.0850
7.5310	0.0780
8.1250	0.0730
8.7190	0.0680
9.3130	0.0630
9.9060	0.0600
10.5000	0.0560
11.5000	0.0470
12.5000	0.0400

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F R A M E S E C T I O N A S S I G N M E N T S T O L I N E O B J E C T S

STORY LEVEL	LINE ID	LINE TYPE	SECTION TYPE	AUTO SELECT SECTION	ANALYSIS SECTION	DESIGN PROCEDURE	DESIGN SECTION
N+4.00	C8	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+3.33	C8	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+3.33	C10	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+2.66	C8	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+2.66	C10	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+2.66	C12	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+2.00	C8	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+2.00	C10	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+2.00	C12	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+2.00	C14	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+1.33	C8	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+1.33	C10	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+1.33	C12	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+1.33	C14	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+0.66	C8	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+0.66	C10	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+0.66	C12	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+0.66	C14	Column	Rectangular	None	COL50X50	Conc Frame	COL50X50
N+4.00	B64	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+4.00	B76	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+4.00	B83	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+4.00	B134	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
N+4.00	B136	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+4.00	B137	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+4.00	B138	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
N+4.00	B139	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
N+3.33	B65	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+3.33	B66	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+3.33	B84	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+3.33	B85	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+3.33	B128	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
N+3.33	B129	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
N+3.33	B130	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+3.33	B132	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.66	B67	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.66	B68	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.66	B86	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.66	B87	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.66	B122	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
N+2.66	B123	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
N+2.66	B124	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.66	B126	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.00	B63	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.00	B69	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.00	B81	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.00	B82	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.00	B116	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
N+2.00	B118	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
N+2.00	B119	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50

N+0.66	B59	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+0.66	B60	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+0.66	B77	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+0.66	B78	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+0.66	B104	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
N+0.66	B105	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
N+0.66	B107	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+0.66	B109	Beam	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
BASE	B103	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
BASE	B142	Beam	Rectangular	None	VIG40X50	Conc Frame	VIG40X50
N+4.00	D17	Brace	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+4.00	D29	Brace	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+3.33	D30	Brace	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+3.33	D32	Brace	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.66	D19	Brace	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.66	D31	Brace	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.00	D16	Brace	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+2.00	D28	Brace	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+1.33	D15	Brace	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+1.33	D27	Brace	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+0.66	D14	Brace	Rectangular	None	VIG15X50	Conc Frame	VIG15X50
N+0.66	D26	Brace	Rectangular	None	VIG15X50	Conc Frame	VIG15X50

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D I S T R I B U T E D L O A D A S S I G N M E N T S T O L I N E O B J E C T S

LOAD CASE	STORY LEVEL	LINE ID	LOAD TYPE	LOAD DIRECTION	ABSOLUTE DISTANCE A	ABSOLUTE DISTANCE B	LOAD A PER LENGTH	LOAD B PER LENGTH
DEAD	N+4.00	D17	Force	Gravity	0.000	7.669	3.400	3.400
DEAD	N+4.00	D29	Force	Gravity	0.000	7.669	3.400	3.400
DEAD	N+3.33	D30	Force	Gravity	0.000	7.440	3.400	3.400
DEAD	N+3.33	D32	Force	Gravity	0.000	7.440	3.400	3.400
DEAD	N+2.66	D19	Force	Gravity	0.000	7.091	3.400	3.400
DEAD	N+2.66	D31	Force	Gravity	0.000	7.091	3.400	3.400
DEAD	N+2.00	D16	Force	Gravity	0.000	7.092	3.400	3.400
DEAD	N+2.00	D28	Force	Gravity	0.000	7.092	3.400	3.400
DEAD	N+1.33	D15	Force	Gravity	0.000	7.440	3.400	3.400
DEAD	N+1.33	D27	Force	Gravity	0.000	7.440	3.400	3.400
DEAD	N+0.66	D14	Force	Gravity	0.000	7.668	3.400	3.400
DEAD	N+0.66	D26	Force	Gravity	0.000	7.668	3.400	3.400
LIVE	N+4.00	D17	Force	Gravity	0.000	7.669	5.000	5.000
LIVE	N+4.00	D29	Force	Gravity	0.000	7.669	5.000	5.000
LIVE	N+3.33	D30	Force	Gravity	0.000	7.440	5.000	5.000
LIVE	N+3.33	D32	Force	Gravity	0.000	7.440	5.000	5.000
LIVE	N+2.66	D19	Force	Gravity	0.000	7.091	5.000	5.000
LIVE	N+2.66	D31	Force	Gravity	0.000	7.091	5.000	5.000
LIVE	N+2.00	D16	Force	Gravity	0.000	7.092	5.000	5.000
LIVE	N+2.00	D28	Force	Gravity	0.000	7.092	5.000	5.000
LIVE	N+1.33	D15	Force	Gravity	0.000	7.440	5.000	5.000
LIVE	N+1.33	D27	Force	Gravity	0.000	7.440	5.000	5.000
LIVE	N+0.66	D14	Force	Gravity	0.000	7.668	5.000	5.000
LIVE	N+0.66	D26	Force	Gravity	0.000	7.668	5.000	5.000

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U N I F O R M L O A D A S S I G N M E N T S T O A R E A O B J E C T S

CASE	STORY	AREA	AREATYPE	DIRECTION	LOAD
LIVE	N+4.00	F14	Floor	Gravity	5.0000
LIVE	N+4.00	F15	Floor	Gravity	5.0000
LIVE	N+3.33	F16	Floor	Gravity	5.0000
LIVE	N+3.33	F17	Floor	Gravity	5.0000
LIVE	N+2.66	F18	Floor	Gravity	5.0000
LIVE	N+2.66	F19	Floor	Gravity	5.0000
LIVE	N+2.00	F20	Floor	Gravity	5.0000
LIVE	N+2.00	F21	Floor	Gravity	5.0000
LIVE	N+2.00	F22	Floor	Gravity	5.0000

7.6.1 FUERZAS EN VIGAS

BEAM FORCES
UNID: kN-m

Story	Beam	Load	Loc	P	V2	V3	T	M2	M3
N+0.66	B59	ENVOLVENTE MAX	0	75.36	53.93	0.14	4.044	0.706	-3.973
N+0.66	B59	ENVOLVENTE MAX	0.075	75.36	54.77	0.14	4.044	0.709	-5.385
N+0.66	B59	ENVOLVENTE MAX	0.15	75.36	55.62	0.14	4.044	0.712	-6.793
N+0.66	B59	ENVOLVENTE MAX	0.225	75.36	56.46	0.14	4.044	0.715	-8.191
N+0.66	B59	ENVOLVENTE MAX	0.3	75.36	57.31	0.14	4.044	0.719	-9.564
N+0.66	B59	ENVOLVENTE MAX	0.375	75.36	58.15	0.14	4.044	0.722	-10.884
N+0.66	B59	ENVOLVENTE MAX	0.45	75.36	58.99	0.14	4.044	0.725	-12.113
N+0.66	B59	ENVOLVENTE MAX	0.525	75.36	59.84	0.14	4.044	0.729	-13.238
N+0.66	B59	ENVOLVENTE MAX	0.6	75.36	60.68	0.14	4.044	0.732	-14.294
N+0.66	B59	ENVOLVENTE MAX	0.675	75.36	61.52	0.14	4.044	0.736	-15.319
N+0.66	B59	ENVOLVENTE MAX	0.75	75.36	62.37	0.14	4.044	0.74	-16.336
N+0.66	B59	ENVOLVENTE MIN	0	-83.74	3.25	-0.15	0.599	-0.938	-49.499
N+0.66	B59	ENVOLVENTE MIN	0.075	-83.74	3.6	-0.15	0.599	-0.94	-52.421
N+0.66	B59	ENVOLVENTE MIN	0.15	-83.74	3.95	-0.15	0.599	-0.942	-55.893
N+0.66	B59	ENVOLVENTE MIN	0.225	-83.74	4.3	-0.15	0.599	-0.944	-59.857
N+0.66	B59	ENVOLVENTE MIN	0.3	-83.74	4.66	-0.15	0.599	-0.947	-63.901
N+0.66	B59	ENVOLVENTE MIN	0.375	-83.74	5.01	-0.15	0.599	-0.949	-68.025
N+0.66	B59	ENVOLVENTE MIN	0.45	-83.74	5.36	-0.15	0.599	-0.952	-72.23
N+0.66	B59	ENVOLVENTE MIN	0.525	-83.74	5.71	-0.15	0.599	-0.955	-76.514
N+0.66	B59	ENVOLVENTE MIN	0.6	-83.74	6.06	-0.15	0.599	-0.957	-80.879
N+0.66	B59	ENVOLVENTE MIN	0.675	-83.74	6.41	-0.15	0.599	-0.96	-85.324
N+0.66	B59	ENVOLVENTE MIN	0.75	-83.74	6.77	-0.15	0.599	-0.963	-89.849
N+0.66	B60	ENVOLVENTE MAX	0	76.23	-9.97	0.46	-0.236	0.765	-13.777
N+0.66	B60	ENVOLVENTE MAX	0.075	76.23	-9.62	0.46	-0.236	0.779	-12.575
N+0.66	B60	ENVOLVENTE MAX	0.15	76.23	-9.27	0.46	-0.236	0.795	-11.367
N+0.66	B60	ENVOLVENTE MAX	0.225	76.23	-8.92	0.46	-0.236	0.811	-10.154
N+0.66	B60	ENVOLVENTE MAX	0.3	76.23	-8.57	0.46	-0.236	0.827	-8.934
N+0.66	B60	ENVOLVENTE MAX	0.375	76.23	-8.22	0.46	-0.236	0.845	-7.708
N+0.66	B60	ENVOLVENTE MAX	0.45	76.23	-7.87	0.46	-0.236	0.862	-6.475
N+0.66	B60	ENVOLVENTE MAX	0.525	76.23	-7.51	0.46	-0.236	0.881	-5.237
N+0.66	B60	ENVOLVENTE MAX	0.6	76.23	-7.16	0.46	-0.236	0.899	-3.995
N+0.66	B60	ENVOLVENTE MAX	0.675	76.23	-6.81	0.46	-0.236	0.919	-2.749
N+0.66	B60	ENVOLVENTE MAX	0.75	76.23	-6.46	0.46	-0.236	0.938	-1.5
N+0.66	B60	ENVOLVENTE MIN	0	-83.07	-64.36	-0.41	-3.653	-0.523	-93.946
N+0.66	B60	ENVOLVENTE MIN	0.075	-83.07	-63.29	-0.41	-3.653	-0.542	-89.159
N+0.66	B60	ENVOLVENTE MIN	0.15	-83.07	-62.22	-0.41	-3.653	-0.56	-84.452
N+0.66	B60	ENVOLVENTE MIN	0.225	-83.07	-61.15	-0.41	-3.653	-0.58	-79.826
N+0.66	B60	ENVOLVENTE MIN	0.3	-83.07	-60.09	-0.41	-3.653	-0.6	-75.557
N+0.66	B60	ENVOLVENTE MIN	0.375	-83.07	-59.02	-0.41	-3.653	-0.621	-71.699
N+0.66	B60	ENVOLVENTE MIN	0.45	-83.07	-58.13	-0.41	-3.653	-0.642	-67.937
N+0.66	B60	ENVOLVENTE MIN	0.525	-83.07	-57.29	-0.41	-3.653	-0.663	-64.27
N+0.66	B60	ENVOLVENTE MIN	0.6	-83.07	-56.44	-0.41	-3.653	-0.686	-60.697
N+0.66	B60	ENVOLVENTE MIN	0.675	-83.07	-55.6	-0.41	-3.653	-0.708	-57.218
N+0.66	B60	ENVOLVENTE MIN	0.75	-83.07	-54.76	-0.41	-3.653	-0.731	-53.831
N+1.33	B61	ENVOLVENTE MAX	0	68.16	52.42	0.5	3.506	1.074	0.721
N+1.33	B61	ENVOLVENTE MAX	0.075	68.16	53.27	0.5	3.506	1.052	-0.41
N+1.33	B61	ENVOLVENTE MAX	0.15	68.16	54.11	0.5	3.506	1.03	-1.536
N+1.33	B61	ENVOLVENTE MAX	0.225	68.16	54.96	0.5	3.506	1.008	-2.659
N+1.33	B61	ENVOLVENTE MAX	0.3	68.16	55.8	0.5	3.506	0.987	-3.779
N+1.33	B61	ENVOLVENTE MAX	0.375	68.16	56.64	0.5	3.506	0.966	-4.896
N+1.33	B61	ENVOLVENTE MAX	0.45	68.16	57.49	0.5	3.506	0.946	-6.01
N+1.33	B61	ENVOLVENTE MAX	0.525	68.16	58.33	0.5	3.506	0.926	-7.121
N+1.33	B61	ENVOLVENTE MAX	0.6	68.16	59.17	0.5	3.506	0.907	-8.231
N+1.33	B61	ENVOLVENTE MAX	0.675	68.16	60.02	0.5	3.506	0.888	-9.34
N+1.33	B61	ENVOLVENTE MAX	0.75	68.16	61.03	0.5	3.506	0.87	-10.449
N+1.33	B61	ENVOLVENTE MIN	0	-74.49	5.07	-0.47	0.14	-1.176	-53.399
N+1.33	B61	ENVOLVENTE MIN	0.075	-74.49	5.42	-0.47	0.14	-1.156	-56.626
N+1.33	B61	ENVOLVENTE MIN	0.15	-74.49	5.77	-0.47	0.14	-1.137	-59.946
N+1.33	B61	ENVOLVENTE MIN	0.225	-74.49	6.13	-0.47	0.14	-1.117	-63.359
N+1.33	B61	ENVOLVENTE MIN	0.3	-74.49	6.48	-0.47	0.14	-1.098	-66.865
N+1.33	B61	ENVOLVENTE MIN	0.375	-74.49	6.83	-0.47	0.14	-1.08	-70.464
N+1.33	B61	ENVOLVENTE MIN	0.45	-74.49	7.18	-0.47	0.14	-1.062	-74.155
N+1.33	B61	ENVOLVENTE MIN	0.525	-74.49	7.53	-0.47	0.14	-1.044	-77.939

N+1.33	B62	ENVOLVENTE MAX	0.15	73.06	-7.97	0.7	-0.361	0.867	-4.712
N+1.33	B62	ENVOLVENTE MAX	0.225	73.06	-7.62	0.7	-0.361	0.875	-3.716
N+1.33	B62	ENVOLVENTE MAX	0.3	73.06	-7.27	0.7	-0.361	0.884	-2.724
N+1.33	B62	ENVOLVENTE MAX	0.375	73.06	-6.91	0.7	-0.361	0.896	-1.735
N+1.33	B62	ENVOLVENTE MAX	0.45	73.06	-6.56	0.7	-0.361	0.91	-0.746
N+1.33	B62	ENVOLVENTE MAX	0.525	73.06	-6.21	0.7	-0.361	0.926	0.245
N+1.33	B62	ENVOLVENTE MAX	0.6	73.06	-5.86	0.7	-0.361	0.945	1.238
N+1.33	B62	ENVOLVENTE MAX	0.675	73.06	-5.51	0.7	-0.361	0.966	2.236
N+1.33	B62	ENVOLVENTE MAX	0.75	73.06	-5.16	0.7	-0.361	0.989	3.24
N+1.33	B62	ENVOLVENTE MIN	0	-77.75	-60.02	-0.64	-4.077	-0.732	-87.907
N+1.33	B62	ENVOLVENTE MIN	0.075	-77.75	-58.95	-0.64	-4.077	-0.739	-83.855
N+1.33	B62	ENVOLVENTE MIN	0.15	-77.75	-57.88	-0.64	-4.077	-0.749	-79.886
N+1.33	B62	ENVOLVENTE MIN	0.225	-77.75	-56.87	-0.64	-4.077	-0.76	-76
N+1.33	B62	ENVOLVENTE MIN	0.3	-77.75	-56.03	-0.64	-4.077	-0.774	-72.2
N+1.33	B62	ENVOLVENTE MIN	0.375	-77.75	-55.19	-0.64	-4.077	-0.79	-68.487
N+1.33	B62	ENVOLVENTE MIN	0.45	-77.75	-54.34	-0.64	-4.077	-0.808	-64.863
N+1.33	B62	ENVOLVENTE MIN	0.525	-77.75	-53.5	-0.64	-4.077	-0.829	-61.331
N+1.33	B62	ENVOLVENTE MIN	0.6	-77.75	-52.65	-0.64	-4.077	-0.852	-57.891
N+1.33	B62	ENVOLVENTE MIN	0.675	-77.75	-51.81	-0.64	-4.077	-0.877	-54.545
N+1.33	B62	ENVOLVENTE MIN	0.75	-77.75	-50.97	-0.64	-4.077	-0.905	-51.295
N+2.00	B63	ENVOLVENTE MAX	0	28.55	-8.57	0.15	0.044	0.242	-8.165
N+2.00	B63	ENVOLVENTE MAX	0.225	28.55	-7.52	0.15	0.044	0.211	-6.345
N+2.00	B63	ENVOLVENTE MAX	0.45	28.55	-6.46	0.15	0.044	0.18	-4.76
N+2.00	B63	ENVOLVENTE MAX	0.675	28.55	-5.41	0.15	0.044	0.153	-3.41
N+2.00	B63	ENVOLVENTE MAX	0.9	28.55	-4.35	0.15	0.044	0.129	-2.249
N+2.00	B63	ENVOLVENTE MAX	1.125	28.55	-3.3	0.15	0.044	0.11	-1.303
N+2.00	B63	ENVOLVENTE MAX	1.35	28.55	-2.25	0.15	0.044	0.099	-0.59
N+2.00	B63	ENVOLVENTE MAX	1.575	28.55	-1.19	0.15	0.044	0.096	-0.106
N+2.00	B63	ENVOLVENTE MAX	1.8	28.55	-0.14	0.15	0.044	0.103	0.155
N+2.00	B63	ENVOLVENTE MAX	2.025	28.55	0.92	0.15	0.044	0.116	0.205
N+2.00	B63	ENVOLVENTE MAX	2.25	28.55	3.24	0.15	0.044	0.135	0.062
N+2.00	B63	ENVOLVENTE MIN	0	-32.85	-29.82	-0.13	-3.713	-0.23	-33.649
N+2.00	B63	ENVOLVENTE MIN	0.225	-32.85	-26.62	-0.13	-3.713	-0.203	-27.299
N+2.00	B63	ENVOLVENTE MIN	0.45	-32.85	-23.41	-0.13	-3.713	-0.177	-21.671
N+2.00	B63	ENVOLVENTE MIN	0.675	-32.85	-20.21	-0.13	-3.713	-0.155	-16.764
N+2.00	B63	ENVOLVENTE MIN	0.9	-32.85	-17	-0.13	-3.713	-0.135	-12.923
N+2.00	B63	ENVOLVENTE MIN	1.125	-32.85	-13.79	-0.13	-3.713	-0.121	-9.834
N+2.00	B63	ENVOLVENTE MIN	1.35	-32.85	-10.59	-0.13	-3.713	-0.114	-7.32
N+2.00	B63	ENVOLVENTE MIN	1.575	-32.85	-7.78	-0.13	-3.713	-0.117	-5.383
N+2.00	B63	ENVOLVENTE MIN	1.8	-32.85	-5.25	-0.13	-3.713	-0.128	-4.029
N+2.00	B63	ENVOLVENTE MIN	2.025	-32.85	-2.72	-0.13	-3.713	-0.146	-3.271
N+2.00	B63	ENVOLVENTE MIN	2.25	-32.85	-1.45	-0.13	-3.713	-0.169	-3.127
N+4.00	B64	ENVOLVENTE MAX	0	45.74	3.16	0.28	-0.236	0.624	-0.961
N+4.00	B64	ENVOLVENTE MAX	0.225	45.74	4.87	0.28	-0.236	0.563	-0.386
N+4.00	B64	ENVOLVENTE MAX	0.45	45.74	7.4	0.28	-0.236	0.503	-0.044
N+4.00	B64	ENVOLVENTE MAX	0.675	45.74	9.93	0.28	-0.236	0.444	0.062
N+4.00	B64	ENVOLVENTE MAX	0.9	45.74	12.46	0.28	-0.236	0.386	-0.069
N+4.00	B64	ENVOLVENTE MAX	1.125	45.74	14.99	0.28	-0.236	0.33	-0.436
N+4.00	B64	ENVOLVENTE MAX	1.35	45.74	17.94	0.28	-0.236	0.277	-1.041
N+4.00	B64	ENVOLVENTE MAX	1.575	45.74	21.14	0.28	-0.236	0.229	-1.883
N+4.00	B64	ENVOLVENTE MAX	1.8	45.74	24.35	0.28	-0.236	0.188	-2.962
N+4.00	B64	ENVOLVENTE MAX	2.025	45.74	27.56	0.28	-0.236	0.161	-4.279
N+4.00	B64	ENVOLVENTE MAX	2.25	45.74	30.76	0.28	-0.236	0.153	-5.832
N+4.00	B64	ENVOLVENTE MIN	0	-46.34	-3.94	-0.28	-7.494	-0.698	-6.598
N+4.00	B64	ENVOLVENTE MIN	0.225	-46.34	-2.06	-0.28	-7.494	-0.638	-7.401
N+4.00	B64	ENVOLVENTE MIN	0.45	-46.34	-1.01	-0.28	-7.494	-0.579	-8.778
N+4.00	B64	ENVOLVENTE MIN	0.675	-46.34	0.05	-0.28	-7.494	-0.521	-10.725
N+4.00	B64	ENVOLVENTE MIN	0.9	-46.34	1.1	-0.28	-7.494	-0.464	-13.243
N+4.00	B64	ENVOLVENTE MIN	1.125	-46.34	2.16	-0.28	-7.494	-0.409	-16.33
N+4.00	B64	ENVOLVENTE MIN	1.35	-46.34	3.21	-0.28	-7.494	-0.356	-19.988
N+4.00	B64	ENVOLVENTE MIN	1.575	-46.34	4.27	-0.28	-7.494	-0.309	-24.215
N+4.00	B64	ENVOLVENTE MIN	1.8	-46.34	5.32	-0.28	-7.494	-0.269	-29.011
N+4.00	B64	ENVOLVENTE MIN	2.025	-46.34	6.38	-0.28	-7.494	-0.243	-34.377
N+4.00	B64	ENVOLVENTE MIN	2.25	-46.34	7.43	-0.28	-7.494	-0.235	-40.313
N+3.33	B65	ENVOLVENTE MAX	0	102.22	59.26	1.82	1.833	1.643	24.375
N+3.33	B65	ENVOLVENTE MAX	0.075	102.22	60.11	1.82	1.833	1.565	24.531
N+3.33	B65	ENVOLVENTE MAX	0.15	102.22	60.95	1.82	1.833	1.494	24.668

N+3.33	B65	ENVOLVENTE MIN	0.3	-104.81	-5.2	-1.59	-6.401	-1.592	-80.228
N+3.33	B65	ENVOLVENTE MIN	0.375	-104.81	-4.85	-1.59	-6.401	-1.551	-84.657
N+3.33	B65	ENVOLVENTE MIN	0.45	-104.81	-4.5	-1.59	-6.401	-1.513	-89.155
N+3.33	B65	ENVOLVENTE MIN	0.525	-104.81	-4.14	-1.59	-6.401	-1.477	-93.722
N+3.33	B65	ENVOLVENTE MIN	0.6	-104.81	-3.79	-1.59	-6.401	-1.442	-98.358
N+3.33	B65	ENVOLVENTE MIN	0.675	-104.81	-3.44	-1.59	-6.401	-1.51	-103.064
N+3.33	B65	ENVOLVENTE MIN	0.75	-104.81	-3.09	-1.59	-6.401	-1.591	-107.839
N+3.33	B66	ENVOLVENTE MAX	0	88.24	-8.42	1.46	5.542	1.677	6.814
N+3.33	B66	ENVOLVENTE MAX	0.075	88.24	-8.07	1.46	5.542	1.712	7.862
N+3.33	B66	ENVOLVENTE MAX	0.15	88.24	-7.72	1.46	5.542	1.752	8.903
N+3.33	B66	ENVOLVENTE MAX	0.225	88.24	-7.37	1.46	5.542	1.794	9.938
N+3.33	B66	ENVOLVENTE MAX	0.3	88.24	-7.02	1.46	5.542	1.839	10.973
N+3.33	B66	ENVOLVENTE MAX	0.375	88.24	-6.66	1.46	5.542	1.887	12.009
N+3.33	B66	ENVOLVENTE MAX	0.45	88.24	-6.31	1.46	5.542	1.988	13.054
N+3.33	B66	ENVOLVENTE MAX	0.525	88.24	-5.96	1.46	5.542	2.095	14.11
N+3.33	B66	ENVOLVENTE MAX	0.6	88.24	-5.61	1.46	5.542	2.205	15.182
N+3.33	B66	ENVOLVENTE MAX	0.675	88.24	-5.26	1.46	5.542	2.317	16.272
N+3.33	B66	ENVOLVENTE MAX	0.75	88.24	-4.91	1.46	5.542	2.431	17.378
N+3.33	B66	ENVOLVENTE MIN	0	-91.07	-59.16	-1.8	-1.625	-1.467	-95.477
N+3.33	B66	ENVOLVENTE MIN	0.075	-91.07	-58.09	-1.8	-1.625	-1.477	-91.532
N+3.33	B66	ENVOLVENTE MIN	0.15	-91.07	-57.07	-1.8	-1.625	-1.491	-87.669
N+3.33	B66	ENVOLVENTE MIN	0.225	-91.07	-56.23	-1.8	-1.625	-1.508	-83.89
N+3.33	B66	ENVOLVENTE MIN	0.3	-91.07	-55.38	-1.8	-1.625	-1.527	-80.199
N+3.33	B66	ENVOLVENTE MIN	0.375	-91.07	-54.54	-1.8	-1.625	-1.549	-76.601
N+3.33	B66	ENVOLVENTE MIN	0.45	-91.07	-53.7	-1.8	-1.625	-1.625	-73.1
N+3.33	B66	ENVOLVENTE MIN	0.525	-91.07	-52.85	-1.8	-1.625	-1.707	-69.701
N+3.33	B66	ENVOLVENTE MIN	0.6	-91.07	-52.01	-1.8	-1.625	-1.791	-66.407
N+3.33	B66	ENVOLVENTE MIN	0.675	-91.07	-51.16	-1.8	-1.625	-1.878	-63.22
N+3.33	B66	ENVOLVENTE MIN	0.75	-91.07	-50.32	-1.8	-1.625	-1.967	-60.139
N+2.66	B67	ENVOLVENTE MAX	0	80.66	55.66	1.47	0.972	1.504	7.681
N+2.66	B67	ENVOLVENTE MAX	0.075	80.66	56.51	1.47	0.972	1.431	6.687
N+2.66	B67	ENVOLVENTE MAX	0.15	80.66	57.35	1.47	0.972	1.363	5.699
N+2.66	B67	ENVOLVENTE MAX	0.225	80.66	58.29	1.47	0.972	1.301	4.717
N+2.66	B67	ENVOLVENTE MAX	0.3	80.66	59.36	1.47	0.972	1.246	3.738
N+2.66	B67	ENVOLVENTE MAX	0.375	80.66	60.43	1.47	0.972	1.202	2.759
N+2.66	B67	ENVOLVENTE MAX	0.45	80.66	61.5	1.47	0.972	1.169	1.778
N+2.66	B67	ENVOLVENTE MAX	0.525	80.66	62.57	1.47	0.972	1.14	0.793
N+2.66	B67	ENVOLVENTE MAX	0.6	80.66	63.64	1.47	0.972	1.117	-0.2
N+2.66	B67	ENVOLVENTE MAX	0.675	80.66	64.71	1.47	0.972	1.111	-1.201
N+2.66	B67	ENVOLVENTE MAX	0.75	80.66	65.78	1.47	0.972	1.117	-2.214
N+2.66	B67	ENVOLVENTE MIN	0	-86.39	7.26	-1.7	-3.045	-2.028	-63.919
N+2.66	B67	ENVOLVENTE MIN	0.075	-86.39	7.61	-1.7	-3.045	-1.938	-67.689
N+2.66	B67	ENVOLVENTE MIN	0.15	-86.39	7.96	-1.7	-3.045	-1.853	-71.555
N+2.66	B67	ENVOLVENTE MIN	0.225	-86.39	8.31	-1.7	-3.045	-1.775	-75.517
N+2.66	B67	ENVOLVENTE MIN	0.3	-86.39	8.67	-1.7	-3.045	-1.703	-79.57
N+2.66	B67	ENVOLVENTE MIN	0.375	-86.39	9.02	-1.7	-3.045	-1.642	-83.714
N+2.66	B67	ENVOLVENTE MIN	0.45	-86.39	9.37	-1.7	-3.045	-1.592	-87.945
N+2.66	B67	ENVOLVENTE MIN	0.525	-86.39	9.72	-1.7	-3.045	-1.546	-92.262
N+2.66	B67	ENVOLVENTE MIN	0.6	-86.39	10.07	-1.7	-3.045	-1.506	-96.661
N+2.66	B67	ENVOLVENTE MIN	0.675	-86.39	10.42	-1.7	-3.045	-1.484	-101.141
N+2.66	B67	ENVOLVENTE MIN	0.75	-86.39	10.78	-1.7	-3.045	-1.473	-105.699
N+2.66	B68	ENVOLVENTE MAX	0	62.2	-7.82	1.24	5.555	1.638	-0.69
N+2.66	B68	ENVOLVENTE MAX	0.075	62.2	-7.47	1.24	5.555	1.67	0.139
N+2.66	B68	ENVOLVENTE MAX	0.15	62.2	-7.12	1.24	5.555	1.705	0.956
N+2.66	B68	ENVOLVENTE MAX	0.225	62.2	-6.76	1.24	5.555	1.743	1.762
N+2.66	B68	ENVOLVENTE MAX	0.3	62.2	-6.41	1.24	5.555	1.783	2.558
N+2.66	B68	ENVOLVENTE MAX	0.375	62.2	-6.06	1.24	5.555	1.827	3.345
N+2.66	B68	ENVOLVENTE MAX	0.45	62.2	-5.71	1.24	5.555	1.872	4.124
N+2.66	B68	ENVOLVENTE MAX	0.525	62.2	-5.36	1.24	5.555	1.92	4.897
N+2.66	B68	ENVOLVENTE MAX	0.6	62.2	-5.01	1.24	5.555	1.972	5.664
N+2.66	B68	ENVOLVENTE MAX	0.675	62.2	-4.65	1.24	5.555	2.036	6.428
N+2.66	B68	ENVOLVENTE MAX	0.75	62.2	-4.3	1.24	5.555	2.103	7.188
N+2.66	B68	ENVOLVENTE MIN	0	-73.9	-54.64	-1.28	0.456	-1.282	-85.233
N+2.66	B68	ENVOLVENTE MIN	0.075	-73.9	-53.58	-1.28	0.456	-1.31	-81.463
N+2.66	B68	ENVOLVENTE MIN	0.15	-73.9	-52.51	-1.28	0.456	-1.341	-77.77
N+2.66	B68	ENVOLVENTE MIN	0.225	-73.9	-51.57	-1.28	0.456	-1.376	-74.156
N+2.66	B68	ENVOLVENTE MIN	0.3	-73.9	-50.72	-1.28	0.456	-1.413	-70.622

N+2.00	B69	ENVOLVENTE MAX	1.35	28.37	-2.05	0.1	4.306	0.167	-0.365
N+2.00	B69	ENVOLVENTE MAX	1.575	28.37	-1	0.1	4.306	0.16	-0.008
N+2.00	B69	ENVOLVENTE MAX	1.8	28.37	0.06	0.1	4.306	0.155	0.119
N+2.00	B69	ENVOLVENTE MAX	2.025	28.37	1.11	0.1	4.306	0.153	0.026
N+2.00	B69	ENVOLVENTE MAX	2.25	28.37	3.22	0.1	4.306	0.155	-0.171
N+2.00	B69	ENVOLVENTE MIN	0	-34.16	-30.31	-0.12	0.199	-0.304	-35.337
N+2.00	B69	ENVOLVENTE MIN	0.225	-34.16	-27.11	-0.12	0.199	-0.28	-28.877
N+2.00	B69	ENVOLVENTE MIN	0.45	-34.16	-23.9	-0.12	0.199	-0.259	-23.246
N+2.00	B69	ENVOLVENTE MIN	0.675	-34.16	-20.69	-0.12	0.199	-0.239	-18.766
N+2.00	B69	ENVOLVENTE MIN	0.9	-34.16	-17.49	-0.12	0.199	-0.22	-14.856
N+2.00	B69	ENVOLVENTE MIN	1.125	-34.16	-14.28	-0.12	0.199	-0.203	-11.517
N+2.00	B69	ENVOLVENTE MIN	1.35	-34.16	-11.08	-0.12	0.199	-0.188	-8.75
N+2.00	B69	ENVOLVENTE MIN	1.575	-34.16	-8.54	-0.12	0.199	-0.175	-6.557
N+2.00	B69	ENVOLVENTE MIN	1.8	-34.16	-6.01	-0.12	0.199	-0.165	-4.941
N+2.00	B69	ENVOLVENTE MIN	2.025	-34.16	-3.48	-0.12	0.199	-0.158	-3.911
N+2.00	B69	ENVOLVENTE MIN	2.25	-34.16	-2	-0.12	0.199	-0.155	-3.584
N+4.00	B76	ENVOLVENTE MAX	0	13.47	0.82	0.1	0.454	0.49	1.627
N+4.00	B76	ENVOLVENTE MAX	0.225	13.47	2.48	0.1	0.454	0.509	1.466
N+4.00	B76	ENVOLVENTE MAX	0.45	13.47	6.03	0.1	0.454	0.528	0.519
N+4.00	B76	ENVOLVENTE MAX	0.675	13.47	10.52	0.1	0.454	0.548	-0.806
N+4.00	B76	ENVOLVENTE MAX	0.9	13.47	15.02	0.1	0.454	0.568	-2.026
N+4.00	B76	ENVOLVENTE MAX	1.125	13.47	19.52	0.1	0.454	0.588	-3.346
N+4.00	B76	ENVOLVENTE MAX	1.35	13.47	24.02	0.1	0.454	0.608	-4.89
N+4.00	B76	ENVOLVENTE MAX	1.575	13.47	28.52	0.1	0.454	0.628	-6.732
N+4.00	B76	ENVOLVENTE MAX	1.8	13.47	33.01	0.1	0.454	0.649	-8.882
N+4.00	B76	ENVOLVENTE MAX	2.025	13.47	37.51	0.1	0.454	0.67	-11.341
N+4.00	B76	ENVOLVENTE MAX	2.25	13.47	42.01	0.1	0.454	0.69	-14.11
N+4.00	B76	ENVOLVENTE MIN	0	-13.87	-2.97	-0.1	-0.929	-0.568	-0.563
N+4.00	B76	ENVOLVENTE MIN	0.225	-13.87	0.52	-0.1	-0.929	-0.587	-0.527
N+4.00	B76	ENVOLVENTE MIN	0.45	-13.87	1.9	-0.1	-0.929	-0.606	-0.803
N+4.00	B76	ENVOLVENTE MIN	0.675	-13.87	3.28	-0.1	-0.929	-0.625	-1.801
N+4.00	B76	ENVOLVENTE MIN	0.9	-13.87	4.67	-0.1	-0.929	-0.645	-4.401
N+4.00	B76	ENVOLVENTE MIN	1.125	-13.87	6.05	-0.1	-0.929	-0.665	-8.287
N+4.00	B76	ENVOLVENTE MIN	1.35	-13.87	7.43	-0.1	-0.929	-0.685	-13.185
N+4.00	B76	ENVOLVENTE MIN	1.575	-13.87	8.81	-0.1	-0.929	-0.705	-19.095
N+4.00	B76	ENVOLVENTE MIN	1.8	-13.87	10.2	-0.1	-0.929	-0.725	-26.017
N+4.00	B76	ENVOLVENTE MIN	2.025	-13.87	11.58	-0.1	-0.929	-0.746	-33.952
N+4.00	B76	ENVOLVENTE MIN	2.25	-13.87	12.96	-0.1	-0.929	-0.766	-42.898
N+0.66	B77	ENVOLVENTE MAX	0	29.37	55.95	0.84	-2.166	0.897	-9.374
N+0.66	B77	ENVOLVENTE MAX	0.075	29.37	57.02	0.84	-2.166	0.983	-10.42
N+0.66	B77	ENVOLVENTE MAX	0.15	29.37	58.09	0.84	-2.166	1.069	-11.486
N+0.66	B77	ENVOLVENTE MAX	0.225	29.37	59.16	0.84	-2.166	1.156	-12.574
N+0.66	B77	ENVOLVENTE MAX	0.3	29.37	60.23	0.84	-2.166	1.242	-13.684
N+0.66	B77	ENVOLVENTE MAX	0.375	29.37	61.3	0.84	-2.166	1.329	-14.817
N+0.66	B77	ENVOLVENTE MAX	0.45	29.37	62.36	0.84	-2.166	1.415	-15.974
N+0.66	B77	ENVOLVENTE MAX	0.525	29.37	63.43	0.84	-2.166	1.502	-17.155
N+0.66	B77	ENVOLVENTE MAX	0.6	29.37	64.5	0.84	-2.166	1.589	-18.36
N+0.66	B77	ENVOLVENTE MAX	0.675	29.37	65.57	0.84	-2.166	1.676	-19.59
N+0.66	B77	ENVOLVENTE MAX	0.75	29.37	66.64	0.84	-2.166	1.763	-20.844
N+0.66	B77	ENVOLVENTE MIN	0	-33.54	13.19	-1.16	-8.999	-0.652	-45.492
N+0.66	B77	ENVOLVENTE MIN	0.075	-33.54	13.54	-1.16	-8.999	-0.714	-49.728
N+0.66	B77	ENVOLVENTE MIN	0.15	-33.54	13.89	-1.16	-8.999	-0.775	-54.045
N+0.66	B77	ENVOLVENTE MIN	0.225	-33.54	14.24	-1.16	-8.999	-0.837	-58.442
N+0.66	B77	ENVOLVENTE MIN	0.3	-33.54	14.59	-1.16	-8.999	-0.899	-62.919
N+0.66	B77	ENVOLVENTE MIN	0.375	-33.54	14.95	-1.16	-8.999	-0.962	-67.476
N+0.66	B77	ENVOLVENTE MIN	0.45	-33.54	15.3	-1.16	-8.999	-1.024	-72.113
N+0.66	B77	ENVOLVENTE MIN	0.525	-33.54	15.65	-1.16	-8.999	-1.086	-76.831
N+0.66	B77	ENVOLVENTE MIN	0.6	-33.54	16	-1.16	-8.999	-1.148	-81.628
N+0.66	B77	ENVOLVENTE MIN	0.675	-33.54	16.35	-1.16	-8.999	-1.211	-86.506
N+0.66	B77	ENVOLVENTE MIN	0.75	-33.54	16.7	-1.16	-8.999	-1.273	-91.464
N+0.66	B78	ENVOLVENTE MAX	0	56.54	-11.85	1.21	9.598	1.477	-17.266
N+0.66	B78	ENVOLVENTE MAX	0.075	56.54	-11.5	1.21	9.598	1.388	-16.361
N+0.66	B78	ENVOLVENTE MAX	0.15	56.54	-11.15	1.21	9.598	1.299	-15.479
N+0.66	B78	ENVOLVENTE MAX	0.225	56.54	-10.8	1.21	9.598	1.209	-14.619
N+0.66	B78	ENVOLVENTE MAX	0.3	56.54	-10.45	1.21	9.598	1.12	-13.78
N+0.66	B78	ENVOLVENTE MAX	0.375	56.54	-10.09	1.21	9.598	1.032	-12.961
N+0.66	B78	ENVOLVENTE MAX	0.45	56.54	-9.74	1.21	9.598	0.943	-12.159

N+0.66	B78	ENVOLVENTE MIN	0.6	-61.4	-62.45	-1.51	1.841	-1.069	-60.88
N+0.66	B78	ENVOLVENTE MIN	0.675	-61.4	-61.38	-1.51	1.841	-0.96	-56.237
N+0.66	B78	ENVOLVENTE MIN	0.75	-61.4	-60.53	-1.51	1.841	-0.871	-51.673
N+1.33	B79	ENVOLVENTE MAX	0	57.26	57.68	1.48	-1.832	0.797	-6.366
N+1.33	B79	ENVOLVENTE MAX	0.075	57.26	58.53	1.48	-1.832	0.917	-6.963
N+1.33	B79	ENVOLVENTE MAX	0.15	57.26	59.37	1.48	-1.832	1.038	-7.572
N+1.33	B79	ENVOLVENTE MAX	0.225	57.26	60.22	1.48	-1.832	1.16	-8.197
N+1.33	B79	ENVOLVENTE MAX	0.3	57.26	61.06	1.48	-1.832	1.282	-8.841
N+1.33	B79	ENVOLVENTE MAX	0.375	57.26	61.9	1.48	-1.832	1.405	-9.504
N+1.33	B79	ENVOLVENTE MAX	0.45	57.26	62.75	1.48	-1.832	1.529	-10.189
N+1.33	B79	ENVOLVENTE MAX	0.525	57.26	63.69	1.48	-1.832	1.652	-10.895
N+1.33	B79	ENVOLVENTE MAX	0.6	57.26	64.76	1.48	-1.832	1.776	-11.625
N+1.33	B79	ENVOLVENTE MAX	0.675	57.26	65.83	1.48	-1.832	1.9	-12.378
N+1.33	B79	ENVOLVENTE MAX	0.75	57.26	66.9	1.48	-1.832	2.024	-13.155
N+1.33	B79	ENVOLVENTE MIN	0	-62.82	6.75	-1.66	-9.407	-0.661	-47.912
N+1.33	B79	ENVOLVENTE MIN	0.075	-62.82	7.1	-1.66	-9.407	-0.768	-52.168
N+1.33	B79	ENVOLVENTE MIN	0.15	-62.82	7.45	-1.66	-9.407	-0.875	-56.504
N+1.33	B79	ENVOLVENTE MIN	0.225	-62.82	7.81	-1.66	-9.407	-0.984	-60.92
N+1.33	B79	ENVOLVENTE MIN	0.3	-62.82	8.16	-1.66	-9.407	-1.093	-65.416
N+1.33	B79	ENVOLVENTE MIN	0.375	-62.82	8.51	-1.66	-9.407	-1.202	-69.992
N+1.33	B79	ENVOLVENTE MIN	0.45	-62.82	8.86	-1.66	-9.407	-1.312	-74.649
N+1.33	B79	ENVOLVENTE MIN	0.525	-62.82	9.21	-1.66	-9.407	-1.422	-79.386
N+1.33	B79	ENVOLVENTE MIN	0.6	-62.82	9.56	-1.66	-9.407	-1.533	-84.203
N+1.33	B79	ENVOLVENTE MIN	0.675	-62.82	9.92	-1.66	-9.407	-1.643	-89.1
N+1.33	B79	ENVOLVENTE MIN	0.75	-62.82	10.27	-1.66	-9.407	-1.754	-94.077
N+1.33	B80	ENVOLVENTE MAX	0	82.07	-3.34	1.41	8.665	1.747	-2.94
N+1.33	B80	ENVOLVENTE MAX	0.075	82.07	-2.99	1.41	8.665	1.651	-2.674
N+1.33	B80	ENVOLVENTE MAX	0.15	82.07	-2.64	1.41	8.665	1.555	-2.431
N+1.33	B80	ENVOLVENTE MAX	0.225	82.07	-2.29	1.41	8.665	1.461	-2.211
N+1.33	B80	ENVOLVENTE MAX	0.3	82.07	-1.94	1.41	8.665	1.368	-2.012
N+1.33	B80	ENVOLVENTE MAX	0.375	82.07	-1.58	1.41	8.665	1.276	-1.834
N+1.33	B80	ENVOLVENTE MAX	0.45	82.07	-1.23	1.41	8.665	1.186	-1.675
N+1.33	B80	ENVOLVENTE MAX	0.525	82.07	-0.88	1.41	8.665	1.098	-1.535
N+1.33	B80	ENVOLVENTE MAX	0.6	82.07	-0.53	1.41	8.665	1.013	-1.409
N+1.33	B80	ENVOLVENTE MAX	0.675	82.07	-0.18	1.41	8.665	0.932	-1.296
N+1.33	B80	ENVOLVENTE MAX	0.75	82.07	0.17	1.41	8.665	0.854	-1.192
N+1.33	B80	ENVOLVENTE MIN	0	-90.68	-71.3	-1.62	1.37	-2.027	-93.31
N+1.33	B80	ENVOLVENTE MIN	0.075	-90.68	-70.46	-1.62	1.37	-1.915	-88.022
N+1.33	B80	ENVOLVENTE MIN	0.15	-90.68	-69.62	-1.62	1.37	-1.804	-82.801
N+1.33	B80	ENVOLVENTE MIN	0.225	-90.68	-68.77	-1.62	1.37	-1.693	-77.647
N+1.33	B80	ENVOLVENTE MIN	0.3	-90.68	-67.93	-1.62	1.37	-1.584	-72.561
N+1.33	B80	ENVOLVENTE MIN	0.375	-90.68	-67.09	-1.62	1.37	-1.476	-67.543
N+1.33	B80	ENVOLVENTE MIN	0.45	-90.68	-66.24	-1.62	1.37	-1.371	-62.597
N+1.33	B80	ENVOLVENTE MIN	0.525	-90.68	-65.4	-1.62	1.37	-1.267	-57.722
N+1.33	B80	ENVOLVENTE MIN	0.6	-90.68	-64.55	-1.62	1.37	-1.166	-52.921
N+1.33	B80	ENVOLVENTE MIN	0.675	-90.68	-63.71	-1.62	1.37	-1.069	-48.197
N+1.33	B80	ENVOLVENTE MIN	0.75	-90.68	-62.87	-1.62	1.37	-0.975	-43.555
N+2.00	B81	ENVOLVENTE MAX	0	28.03	-13.84	0.19	0.734	0.307	-16.579
N+2.00	B81	ENVOLVENTE MAX	0.225	28.03	-12.62	0.19	0.734	0.267	-13.601
N+2.00	B81	ENVOLVENTE MAX	0.45	28.03	-11.39	0.19	0.734	0.228	-10.899
N+2.00	B81	ENVOLVENTE MAX	0.675	28.03	-10.16	0.19	0.734	0.19	-8.473
N+2.00	B81	ENVOLVENTE MAX	0.9	28.03	-8.94	0.19	0.734	0.154	-6.322
N+2.00	B81	ENVOLVENTE MAX	1.125	28.03	-7.71	0.19	0.734	0.122	-4.447
N+2.00	B81	ENVOLVENTE MAX	1.35	28.03	-6.48	0.19	0.734	0.098	-2.846
N+2.00	B81	ENVOLVENTE MAX	1.575	28.03	-5.25	0.19	0.734	0.087	-1.518
N+2.00	B81	ENVOLVENTE MAX	1.8	28.03	-4.03	0.19	0.734	0.095	-0.453
N+2.00	B81	ENVOLVENTE MAX	2.025	28.03	-2.8	0.19	0.734	0.114	0.931
N+2.00	B81	ENVOLVENTE MAX	2.25	28.03	-1.57	0.19	0.734	0.141	2.82
N+2.00	B81	ENVOLVENTE MIN	0	-25.41	-45.54	-0.16	-1.439	-0.243	-55.925
N+2.00	B81	ENVOLVENTE MIN	0.225	-25.41	-41.65	-0.16	-1.439	-0.21	-46.116
N+2.00	B81	ENVOLVENTE MIN	0.45	-25.41	-37.77	-0.16	-1.439	-0.178	-37.181
N+2.00	B81	ENVOLVENTE MIN	0.675	-25.41	-33.88	-0.16	-1.439	-0.147	-29.12
N+2.00	B81	ENVOLVENTE MIN	0.9	-25.41	-30	-0.16	-1.439	-0.118	-21.934
N+2.00	B81	ENVOLVENTE MIN	1.125	-25.41	-26.11	-0.16	-1.439	-0.094	-15.623
N+2.00	B81	ENVOLVENTE MIN	1.35	-25.41	-22.22	-0.16	-1.439	-0.077	-10.354
N+2.00	B81	ENVOLVENTE MIN	1.575	-25.41	-18.34	-0.16	-1.439	-0.073	-6.115
N+2.00	B81	ENVOLVENTE MIN	1.8	-25.41	-14.45	-0.16	-1.439	-0.088	-2.572

N+2.66	B86	ENVOLVENTE MAX	0.075	119.96	68.49	2.5	11.266	1.526	-6.928
N+2.66	B86	ENVOLVENTE MAX	0.15	119.96	69.33	2.5	11.266	1.679	-7.14
N+2.66	B86	ENVOLVENTE MAX	0.225	119.96	70.18	2.5	11.266	1.855	-7.298
N+2.66	B86	ENVOLVENTE MAX	0.3	119.96	71.02	2.5	11.266	2.04	-7.426
N+2.66	B86	ENVOLVENTE MAX	0.375	119.96	71.86	2.5	11.266	2.231	-7.539
N+2.66	B86	ENVOLVENTE MAX	0.45	119.96	72.71	2.5	11.266	2.427	-7.647
N+2.66	B86	ENVOLVENTE MAX	0.525	119.96	73.55	2.5	11.266	2.626	-7.757
N+2.66	B86	ENVOLVENTE MAX	0.6	119.96	74.39	2.5	11.266	2.829	-7.876
N+2.66	B86	ENVOLVENTE MAX	0.675	119.96	75.24	2.5	11.266	3.035	-8.006
N+2.66	B86	ENVOLVENTE MAX	0.75	119.96	76.08	2.5	11.266	3.242	-8.151
N+2.66	B86	ENVOLVENTE MIN	0	-117.14	-2.37	-3.24	1.195	-1.237	-47.374
N+2.66	B86	ENVOLVENTE MIN	0.075	-117.14	-2.02	-3.24	1.195	-1.283	-51.695
N+2.66	B86	ENVOLVENTE MIN	0.15	-117.14	-1.67	-3.24	1.195	-1.38	-56.096
N+2.66	B86	ENVOLVENTE MIN	0.225	-117.14	-1.32	-3.24	1.195	-1.501	-60.699
N+2.66	B86	ENVOLVENTE MIN	0.3	-117.14	-0.96	-3.24	1.195	-1.63	-65.78
N+2.66	B86	ENVOLVENTE MIN	0.375	-117.14	-0.61	-3.24	1.195	-1.765	-70.966
N+2.66	B86	ENVOLVENTE MIN	0.45	-117.14	-0.26	-3.24	1.195	-1.906	-76.247
N+2.66	B86	ENVOLVENTE MIN	0.525	-117.14	0.09	-3.24	1.195	-2.05	-81.615
N+2.66	B86	ENVOLVENTE MIN	0.6	-117.14	0.44	-3.24	1.195	-2.197	-87.064
N+2.66	B86	ENVOLVENTE MIN	0.675	-117.14	0.79	-3.24	1.195	-2.347	-92.592
N+2.66	B86	ENVOLVENTE MIN	0.75	-117.14	1.14	-3.24	1.195	-2.499	-98.194
N+2.66	B87	ENVOLVENTE MAX	0	89.84	-5.67	2.54	-0.671	2.524	-5.259
N+2.66	B87	ENVOLVENTE MAX	0.075	89.84	-5.32	2.54	-0.671	2.342	-4.766
N+2.66	B87	ENVOLVENTE MAX	0.15	89.84	-4.96	2.54	-0.671	2.16	-4.289
N+2.66	B87	ENVOLVENTE MAX	0.225	89.84	-4.61	2.54	-0.671	1.981	-3.824
N+2.66	B87	ENVOLVENTE MAX	0.3	89.84	-4.26	2.54	-0.671	1.817	-3.367
N+2.66	B87	ENVOLVENTE MAX	0.375	89.84	-3.91	2.54	-0.671	1.656	-2.916
N+2.66	B87	ENVOLVENTE MAX	0.45	89.84	-3.56	2.54	-0.671	1.497	-2.464
N+2.66	B87	ENVOLVENTE MAX	0.525	89.84	-3.21	2.54	-0.671	1.342	-2.005
N+2.66	B87	ENVOLVENTE MAX	0.6	89.84	-2.85	2.54	-0.671	1.191	-1.532
N+2.66	B87	ENVOLVENTE MAX	0.675	89.84	-2.5	2.54	-0.671	1.047	-1.038
N+2.66	B87	ENVOLVENTE MAX	0.75	89.84	-2.15	2.54	-0.671	0.913	-0.517
N+2.66	B87	ENVOLVENTE MIN	0	-75.79	-69.94	-3.17	-7.702	-3.281	-92.427
N+2.66	B87	ENVOLVENTE MIN	0.075	-75.79	-69.1	-3.17	-7.702	-3.051	-87.293
N+2.66	B87	ENVOLVENTE MIN	0.15	-75.79	-68.25	-3.17	-7.702	-2.823	-82.235
N+2.66	B87	ENVOLVENTE MIN	0.225	-75.79	-67.41	-3.17	-7.702	-2.596	-77.254
N+2.66	B87	ENVOLVENTE MIN	0.3	-75.79	-66.57	-3.17	-7.702	-2.384	-72.353
N+2.66	B87	ENVOLVENTE MIN	0.375	-75.79	-65.72	-3.17	-7.702	-2.176	-67.538
N+2.66	B87	ENVOLVENTE MIN	0.45	-75.79	-64.88	-3.17	-7.702	-1.969	-62.812
N+2.66	B87	ENVOLVENTE MIN	0.525	-75.79	-64.03	-3.17	-7.702	-1.766	-58.183
N+2.66	B87	ENVOLVENTE MIN	0.6	-75.79	-63.19	-3.17	-7.702	-1.568	-53.658
N+2.66	B87	ENVOLVENTE MIN	0.675	-75.79	-62.35	-3.17	-7.702	-1.377	-49.243
N+2.66	B87	ENVOLVENTE MIN	0.75	-75.79	-61.5	-3.17	-7.702	-1.196	-44.945
BASE	B103	ENVOLVENTE MAX	0	0.02	-3.13	1.12	-9.32	2.093	1.714
BASE	B103	ENVOLVENTE MAX	0.2	0.02	-2.27	1.12	-9.32	1.872	2.368
BASE	B103	ENVOLVENTE MAX	0.4	0.02	-1.35	1.12	-9.32	1.653	2.847
BASE	B103	ENVOLVENTE MAX	0.6	0.02	-0.2	1.12	-9.32	1.435	3.096
BASE	B103	ENVOLVENTE MAX	0.8	0.02	0.95	1.12	-9.32	1.219	3.115
BASE	B103	ENVOLVENTE MAX	1	0.02	2.1	1.12	-9.32	1.006	3.004
BASE	B103	ENVOLVENTE MAX	1.2	0.02	3.26	1.12	-9.32	0.8	2.845
BASE	B103	ENVOLVENTE MAX	1.4	0.02	4.41	1.12	-9.32	0.605	2.459
BASE	B103	ENVOLVENTE MAX	1.6	0.02	5.56	1.12	-9.32	0.437	1.845
BASE	B103	ENVOLVENTE MAX	1.8	0.02	6.71	1.12	-9.32	0.334	1.282
BASE	B103	ENVOLVENTE MAX	2	0.02	7.86	1.12	-9.32	0.361	0.653
BASE	B103	ENVOLVENTE MIN	0	-0.02	-6.38	-1.32	-54.221	-2.608	-0.89
BASE	B103	ENVOLVENTE MIN	0.2	-0.02	-5.04	-1.32	-54.221	-2.347	0.036
BASE	B103	ENVOLVENTE MIN	0.4	-0.02	-3.7	-1.32	-54.221	-2.087	0.788
BASE	B103	ENVOLVENTE MIN	0.6	-0.02	-2.48	-1.32	-54.221	-1.828	1.354
BASE	B103	ENVOLVENTE MIN	0.8	-0.02	-1.62	-1.32	-54.221	-1.572	1.602
BASE	B103	ENVOLVENTE MIN	1	-0.02	-0.76	-1.32	-54.221	-1.319	1.513
BASE	B103	ENVOLVENTE MIN	1.2	-0.02	0.11	-1.32	-54.221	-1.072	1.201
BASE	B103	ENVOLVENTE MIN	1.4	-0.02	0.97	-1.32	-54.221	-0.837	0.713
BASE	B103	ENVOLVENTE MIN	1.6	-0.02	1.84	-1.32	-54.221	-0.628	0.049
BASE	B103	ENVOLVENTE MIN	1.8	-0.02	2.7	-1.32	-54.221	-0.485	-1.068
BASE	B103	ENVOLVENTE MIN	2	-0.02	3.56	-1.32	-54.221	-0.471	-2.523
N+0.66	B104	ENVOLVENTE MAX	0	12.69	-90.39	65.65	29.103	24.78	-101.284
N+0.66	B104	ENVOLVENTE MAX	0.025	12.69	-90.29	65.65	29.103	24.014	-98.997

N+0.66	B104	ENVOLVENTE MIN	0.075	-12.72	-275.39	-67.53	-44.644	-30.932	-321.352
N+0.66	B104	ENVOLVENTE MIN	0.1	-12.72	-275.25	-67.53	-44.644	-30.403	-314.469
N+0.66	B104	ENVOLVENTE MIN	0.125	-12.72	-275.11	-67.53	-44.644	-29.983	-307.589
N+0.66	B104	ENVOLVENTE MIN	0.15	-12.72	-274.96	-67.53	-44.644	-29.674	-300.713
N+0.66	B104	ENVOLVENTE MIN	0.175	-12.72	-274.82	-67.53	-44.644	-29.482	-293.841
N+0.66	B104	ENVOLVENTE MIN	0.2	-12.72	-274.67	-67.53	-44.644	-29.406	-286.973
N+0.66	B104	ENVOLVENTE MIN	0.225	-12.72	-274.53	-67.53	-44.644	-29.446	-280.108
N+0.66	B104	ENVOLVENTE MIN	0.25	-12.72	-274.39	-67.53	-44.644	-29.6	-273.246
N+0.66	B105	ENVOLVENTE MAX	0	7.52	-42.64	4.63	9.056	11.089	-73.839
N+0.66	B105	ENVOLVENTE MAX	0.2	7.52	-41.77	4.63	9.056	10.164	-65.398
N+0.66	B105	ENVOLVENTE MAX	0.4	7.52	-40.91	4.63	9.056	9.239	-57.13
N+0.66	B105	ENVOLVENTE MAX	0.6	7.52	-40.04	4.63	9.056	8.314	-49.035
N+0.66	B105	ENVOLVENTE MAX	0.8	7.52	-39.18	4.63	9.056	7.39	-41.112
N+0.66	B105	ENVOLVENTE MAX	1	7.52	-38.32	4.63	9.056	6.467	-33.362
N+0.66	B105	ENVOLVENTE MAX	1.2	7.52	-37.45	4.63	9.056	5.545	-25.785
N+0.66	B105	ENVOLVENTE MAX	1.4	7.52	-36.59	4.63	9.056	4.625	-18.38
N+0.66	B105	ENVOLVENTE MAX	1.6	7.52	-35.72	4.63	9.056	3.709	-11.148
N+0.66	B105	ENVOLVENTE MAX	1.8	7.52	-34.86	4.63	9.056	2.8	-4.086
N+0.66	B105	ENVOLVENTE MAX	2	7.52	-34	4.63	9.056	1.912	7.327
N+0.66	B105	ENVOLVENTE MIN	0	-6.31	-136.75	-6.47	-13.94	-15.239	-254.649
N+0.66	B105	ENVOLVENTE MIN	0.2	-6.31	-135.6	-6.47	-13.94	-13.946	-227.415
N+0.66	B105	ENVOLVENTE MIN	0.4	-6.31	-134.44	-6.47	-13.94	-12.654	-200.411
N+0.66	B105	ENVOLVENTE MIN	0.6	-6.31	-133.29	-6.47	-13.94	-11.363	-173.637
N+0.66	B105	ENVOLVENTE MIN	0.8	-6.31	-132.14	-6.47	-13.94	-10.072	-147.094
N+0.66	B105	ENVOLVENTE MIN	1	-6.31	-130.99	-6.47	-13.94	-8.781	-120.781
N+0.66	B105	ENVOLVENTE MIN	1.2	-6.31	-129.84	-6.47	-13.94	-7.492	-94.699
N+0.66	B105	ENVOLVENTE MIN	1.4	-6.31	-128.68	-6.47	-13.94	-6.206	-68.847
N+0.66	B105	ENVOLVENTE MIN	1.6	-6.31	-127.53	-6.47	-13.94	-4.922	-43.225
N+0.66	B105	ENVOLVENTE MIN	1.8	-6.31	-126.38	-6.47	-13.94	-3.647	-17.834
N+0.66	B105	ENVOLVENTE MIN	2	-6.31	-125.23	-6.47	-13.94	-2.391	2.388
N+0.66	B107	ENVOLVENTE MAX	0	4.47	-1.58	0.22	1.2	0.512	-2.659
N+0.66	B107	ENVOLVENTE MAX	0.2	4.47	-1.26	0.22	1.2	0.474	-2.367
N+0.66	B107	ENVOLVENTE MAX	0.4	4.47	-0.93	0.22	1.2	0.436	-2.126
N+0.66	B107	ENVOLVENTE MAX	0.6	4.47	-0.61	0.22	1.2	0.407	-1.893
N+0.66	B107	ENVOLVENTE MAX	0.8	4.47	-0.28	0.22	1.2	0.392	-1.519
N+0.66	B107	ENVOLVENTE MAX	1	4.47	0.04	0.22	1.2	0.378	-1.061
N+0.66	B107	ENVOLVENTE MAX	1.2	4.47	0.36	0.22	1.2	0.366	-0.633
N+0.66	B107	ENVOLVENTE MAX	1.4	4.47	0.69	0.22	1.2	0.356	-0.262
N+0.66	B107	ENVOLVENTE MAX	1.6	4.47	1.01	0.22	1.2	0.349	0.049
N+0.66	B107	ENVOLVENTE MAX	1.8	4.47	1.34	0.22	1.2	0.344	0.296
N+0.66	B107	ENVOLVENTE MAX	2	4.47	1.66	0.22	1.2	0.343	0.48
N+0.66	B107	ENVOLVENTE MIN	0	-4.89	-5.99	-0.17	-1.368	-0.356	-9.71
N+0.66	B107	ENVOLVENTE MIN	0.2	-4.89	-5.56	-0.17	-1.368	-0.329	-8.672
N+0.66	B107	ENVOLVENTE MIN	0.4	-4.89	-5.12	-0.17	-1.368	-0.303	-7.72
N+0.66	B107	ENVOLVENTE MIN	0.6	-4.89	-4.69	-0.17	-1.368	-0.285	-6.855
N+0.66	B107	ENVOLVENTE MIN	0.8	-4.89	-4.26	-0.17	-1.368	-0.281	-6.076
N+0.66	B107	ENVOLVENTE MIN	1	-4.89	-3.83	-0.17	-1.368	-0.278	-5.383
N+0.66	B107	ENVOLVENTE MIN	1.2	-4.89	-3.4	-0.17	-1.368	-0.278	-4.777
N+0.66	B107	ENVOLVENTE MIN	1.4	-4.89	-2.96	-0.17	-1.368	-0.279	-4.257
N+0.66	B107	ENVOLVENTE MIN	1.6	-4.89	-2.53	-0.17	-1.368	-0.283	-4.086
N+0.66	B107	ENVOLVENTE MIN	1.8	-4.89	-2.1	-0.17	-1.368	-0.29	-4.105
N+0.66	B107	ENVOLVENTE MIN	2	-4.89	-1.67	-0.17	-1.368	-0.3	-4.211
N+0.66	B109	ENVOLVENTE MAX	0	3.92	-2.07	0.2	0.667	0.588	-2.845
N+0.66	B109	ENVOLVENTE MAX	0.2	3.92	-1.75	0.2	0.667	0.548	-2.437
N+0.66	B109	ENVOLVENTE MAX	0.4	3.92	-1.42	0.2	0.667	0.508	-2.082
N+0.66	B109	ENVOLVENTE MAX	0.6	3.92	-1.1	0.2	0.667	0.469	-1.767
N+0.66	B109	ENVOLVENTE MAX	0.8	3.92	-0.77	0.2	0.667	0.429	-1.436
N+0.66	B109	ENVOLVENTE MAX	1	3.92	-0.45	0.2	0.667	0.389	-1.024
N+0.66	B109	ENVOLVENTE MAX	1.2	3.92	-0.13	0.2	0.667	0.35	-0.63
N+0.66	B109	ENVOLVENTE MAX	1.4	3.92	0.2	0.2	0.667	0.31	-0.27
N+0.66	B109	ENVOLVENTE MAX	1.6	3.92	0.52	0.2	0.667	0.271	0.037
N+0.66	B109	ENVOLVENTE MAX	1.8	3.92	0.85	0.2	0.667	0.232	0.283
N+0.66	B109	ENVOLVENTE MAX	2	3.92	1.17	0.2	0.667	0.193	0.467
N+0.66	B109	ENVOLVENTE MIN	0	-2.54	-6.36	-0.16	-1.064	-0.448	-10.4
N+0.66	B109	ENVOLVENTE MIN	0.2	-2.54	-5.93	-0.16	-1.064	-0.416	-9.208
N+0.66	B109	ENVOLVENTE MIN	0.4	-2.54	-5.5	-0.16	-1.064	-0.384	-8.102
N+0.66	B109	ENVOLVENTE MIN	0.6	-2.54	-5.06	-0.16	-1.064	-0.352	-7.083
N+0.66	B109	ENVOLVENTE MIN	0.8	-2.54	-4.63	-0.16	-1.064	-0.32	-6.15

N+1.33	B110	ENVOLVENTE MAX	0.125	77.25	-83.6	67.54	62.941	28.719	-80.658
N+1.33	B110	ENVOLVENTE MAX	0.15	77.25	-83.49	67.54	62.941	28.287	-78.524
N+1.33	B110	ENVOLVENTE MAX	0.175	77.25	-83.38	67.54	62.941	27.938	-76.392
N+1.33	B110	ENVOLVENTE MAX	0.2	77.25	-83.28	67.54	62.941	27.675	-74.261
N+1.33	B110	ENVOLVENTE MAX	0.225	77.25	-83.17	67.54	62.941	27.501	-72.132
N+1.33	B110	ENVOLVENTE MAX	0.25	77.25	-83.06	67.54	62.941	27.417	-70.005
N+1.33	B110	ENVOLVENTE MIN	0	-77.31	-266.7	-62.91	-47.303	-35.42	-331.208
N+1.33	B110	ENVOLVENTE MIN	0.025	-77.31	-266.56	-62.91	-47.303	-34.749	-324.542
N+1.33	B110	ENVOLVENTE MIN	0.05	-77.31	-266.41	-62.91	-47.303	-34.14	-317.88
N+1.33	B110	ENVOLVENTE MIN	0.075	-77.31	-266.27	-62.91	-47.303	-33.598	-311.221
N+1.33	B110	ENVOLVENTE MIN	0.1	-77.31	-266.12	-62.91	-47.303	-33.127	-304.566
N+1.33	B110	ENVOLVENTE MIN	0.125	-77.31	-265.98	-62.91	-47.303	-32.731	-297.915
N+1.33	B110	ENVOLVENTE MIN	0.15	-77.31	-265.84	-62.91	-47.303	-32.414	-291.268
N+1.33	B110	ENVOLVENTE MIN	0.175	-77.31	-265.69	-62.91	-47.303	-32.181	-284.623
N+1.33	B110	ENVOLVENTE MIN	0.2	-77.31	-265.55	-62.91	-47.303	-32.034	-277.983
N+1.33	B110	ENVOLVENTE MIN	0.225	-77.31	-265.4	-62.91	-47.303	-31.975	-271.346
N+1.33	B110	ENVOLVENTE MIN	0.25	-77.31	-265.26	-62.91	-47.303	-32.007	-264.713
N+1.33	B111	ENVOLVENTE MAX	0	29.98	-38.75	5.7	15.984	13.824	-66.138
N+1.33	B111	ENVOLVENTE MAX	0.2	29.98	-37.88	5.7	15.984	12.69	-58.475
N+1.33	B111	ENVOLVENTE MAX	0.4	29.98	-37.02	5.7	15.984	11.558	-50.985
N+1.33	B111	ENVOLVENTE MAX	0.6	29.98	-36.15	5.7	15.984	10.428	-43.667
N+1.33	B111	ENVOLVENTE MAX	0.8	29.98	-35.29	5.7	15.984	9.3	-36.523
N+1.33	B111	ENVOLVENTE MAX	1	29.98	-34.43	5.7	15.984	8.176	-29.551
N+1.33	B111	ENVOLVENTE MAX	1.2	29.98	-33.56	5.7	15.984	7.057	-22.751
N+1.33	B111	ENVOLVENTE MAX	1.4	29.98	-32.7	5.7	15.984	5.948	-16.125
N+1.33	B111	ENVOLVENTE MAX	1.6	29.98	-31.83	5.7	15.984	4.853	-9.67
N+1.33	B111	ENVOLVENTE MAX	1.8	29.98	-30.97	5.7	15.984	3.788	-3.386
N+1.33	B111	ENVOLVENTE MAX	2	29.98	-30.11	5.7	15.984	2.791	6.944
N+1.33	B111	ENVOLVENTE MIN	0	-28.63	-132.57	-6.8	-10.33	-16.174	-246.672
N+1.33	B111	ENVOLVENTE MIN	0.2	-28.63	-131.42	-6.8	-10.33	-14.821	-220.274
N+1.33	B111	ENVOLVENTE MIN	0.4	-28.63	-130.26	-6.8	-10.33	-13.47	-194.106
N+1.33	B111	ENVOLVENTE MIN	0.6	-28.63	-129.11	-6.8	-10.33	-12.12	-168.168
N+1.33	B111	ENVOLVENTE MIN	0.8	-28.63	-127.96	-6.8	-10.33	-10.773	-142.461
N+1.33	B111	ENVOLVENTE MIN	1	-28.63	-126.81	-6.8	-10.33	-9.43	-116.984
N+1.33	B111	ENVOLVENTE MIN	1.2	-28.63	-125.66	-6.8	-10.33	-8.092	-91.738
N+1.33	B111	ENVOLVENTE MIN	1.4	-28.63	-124.5	-6.8	-10.33	-6.763	-66.722
N+1.33	B111	ENVOLVENTE MIN	1.6	-28.63	-123.35	-6.8	-10.33	-5.449	-41.936
N+1.33	B111	ENVOLVENTE MIN	1.8	-28.63	-122.2	-6.8	-10.33	-4.165	-17.381
N+1.33	B111	ENVOLVENTE MIN	2	-28.63	-121.05	-6.8	-10.33	-2.949	2.208
N+1.33	B113	ENVOLVENTE MAX	0	4.7	-1.49	0.28	1.534	0.521	-2.675
N+1.33	B113	ENVOLVENTE MAX	0.2	4.7	-1.16	0.28	1.534	0.486	-2.399
N+1.33	B113	ENVOLVENTE MAX	0.4	4.7	-0.84	0.28	1.534	0.455	-2.171
N+1.33	B113	ENVOLVENTE MAX	0.6	4.7	-0.52	0.28	1.534	0.428	-1.914
N+1.33	B113	ENVOLVENTE MAX	0.8	4.7	-0.19	0.28	1.534	0.406	-1.485
N+1.33	B113	ENVOLVENTE MAX	1	4.7	0.13	0.28	1.534	0.391	-1.011
N+1.33	B113	ENVOLVENTE MAX	1.2	4.7	0.46	0.28	1.534	0.383	-0.577
N+1.33	B113	ENVOLVENTE MAX	1.4	4.7	0.78	0.28	1.534	0.382	-0.199
N+1.33	B113	ENVOLVENTE MAX	1.6	4.7	1.1	0.28	1.534	0.39	0.117
N+1.33	B113	ENVOLVENTE MAX	1.8	4.7	1.43	0.28	1.534	0.405	0.37
N+1.33	B113	ENVOLVENTE MAX	2	4.7	1.75	0.28	1.534	0.426	0.56
N+1.33	B113	ENVOLVENTE MIN	0	-4.86	-6.03	-0.25	-1.101	-0.439	-9.859
N+1.33	B113	ENVOLVENTE MIN	0.2	-4.86	-5.6	-0.25	-1.101	-0.41	-8.824
N+1.33	B113	ENVOLVENTE MIN	0.4	-4.86	-5.17	-0.25	-1.101	-0.386	-7.874
N+1.33	B113	ENVOLVENTE MIN	0.6	-4.86	-4.74	-0.25	-1.101	-0.366	-7.011
N+1.33	B113	ENVOLVENTE MIN	0.8	-4.86	-4.3	-0.25	-1.101	-0.351	-6.235
N+1.33	B113	ENVOLVENTE MIN	1	-4.86	-3.87	-0.25	-1.101	-0.342	-5.544
N+1.33	B113	ENVOLVENTE MIN	1.2	-4.86	-3.44	-0.25	-1.101	-0.34	-4.94
N+1.33	B113	ENVOLVENTE MIN	1.4	-4.86	-3.01	-0.25	-1.101	-0.347	-4.431
N+1.33	B113	ENVOLVENTE MIN	1.6	-4.86	-2.58	-0.25	-1.101	-0.361	-4.377
N+1.33	B113	ENVOLVENTE MIN	1.8	-4.86	-2.14	-0.25	-1.101	-0.383	-4.412
N+1.33	B113	ENVOLVENTE MIN	2	-4.86	-1.71	-0.25	-1.101	-0.411	-4.533
N+1.33	B115	ENVOLVENTE MAX	0	3.83	-1.41	0.17	1.351	0.585	-2.492
N+1.33	B115	ENVOLVENTE MAX	0.2	3.83	-1.08	0.17	1.351	0.554	-2.158
N+1.33	B115	ENVOLVENTE MAX	0.4	3.83	-0.76	0.17	1.351	0.522	-1.861
N+1.33	B115	ENVOLVENTE MAX	0.6	3.83	-0.44	0.17	1.351	0.491	-1.586
N+1.33	B115	ENVOLVENTE MAX	0.8	3.83	-0.11	0.17	1.351	0.46	-1.251
N+1.33	B115	ENVOLVENTE MAX	1	3.83	0.21	0.17	1.351	0.43	-0.857

N+1.33	B115	ENVOLVENTE MIN	1.4	-2.76	-2.86	-0.14	-1.032	-0.333	-4.233
N+1.33	B115	ENVOLVENTE MIN	1.6	-2.76	-2.43	-0.14	-1.032	-0.312	-4.214
N+1.33	B115	ENVOLVENTE MIN	1.8	-2.76	-1.99	-0.14	-1.032	-0.292	-4.284
N+1.33	B115	ENVOLVENTE MIN	2	-2.76	-1.56	-0.14	-1.032	-0.273	-4.443
N+2.00	B116	ENVOLVENTE MAX	0	50.09	85.97	4.62	7.498	3.17	3.261
N+2.00	B116	ENVOLVENTE MAX	0.2	50.09	87.12	4.62	7.498	2.787	-2.27
N+2.00	B116	ENVOLVENTE MAX	0.4	50.09	88.27	4.62	7.498	2.679	-6.399
N+2.00	B116	ENVOLVENTE MAX	0.6	50.09	89.43	4.62	7.498	2.848	-10.543
N+2.00	B116	ENVOLVENTE MAX	0.8	50.09	90.58	4.62	7.498	3.229	-14.809
N+2.00	B116	ENVOLVENTE MAX	1	50.09	91.73	4.62	7.498	3.754	-19.226
N+2.00	B116	ENVOLVENTE MAX	1.2	50.09	92.88	4.62	7.498	4.368	-23.804
N+2.00	B116	ENVOLVENTE MAX	1.4	50.09	94.03	4.62	7.498	5.04	-28.548
N+2.00	B116	ENVOLVENTE MAX	1.6	50.09	95.19	4.62	7.498	5.748	-33.461
N+2.00	B116	ENVOLVENTE MAX	1.8	50.09	96.34	4.62	7.498	6.482	-38.544
N+2.00	B116	ENVOLVENTE MAX	2	50.09	97.49	4.62	7.498	7.234	-43.798
N+2.00	B116	ENVOLVENTE MIN	0	-42.66	17.92	-4.08	-39.167	-3.083	-1.216
N+2.00	B116	ENVOLVENTE MIN	0.2	-42.66	18.79	-4.08	-39.167	-2.808	-15.541
N+2.00	B116	ENVOLVENTE MIN	0.4	-42.66	19.65	-4.08	-39.167	-2.807	-33.081
N+2.00	B116	ENVOLVENTE MIN	0.6	-42.66	20.52	-4.08	-39.167	-3.083	-50.851
N+2.00	B116	ENVOLVENTE MIN	0.8	-42.66	21.38	-4.08	-39.167	-3.572	-68.851
N+2.00	B116	ENVOLVENTE MIN	1	-42.66	22.24	-4.08	-39.167	-4.204	-87.082
N+2.00	B116	ENVOLVENTE MIN	1.2	-42.66	23.11	-4.08	-39.167	-4.926	-105.544
N+2.00	B116	ENVOLVENTE MIN	1.4	-42.66	23.97	-4.08	-39.167	-5.705	-124.236
N+2.00	B116	ENVOLVENTE MIN	1.6	-42.66	24.84	-4.08	-39.167	-6.522	-143.158
N+2.00	B116	ENVOLVENTE MIN	1.8	-42.66	25.7	-4.08	-39.167	-7.363	-162.31
N+2.00	B116	ENVOLVENTE MIN	2	-42.66	26.56	-4.08	-39.167	-8.222	-181.693
N+2.00	B118	ENVOLVENTE MAX	0	59.95	-24.88	2.47	30.55	4.389	-39.531
N+2.00	B118	ENVOLVENTE MAX	0.2	59.95	-24.01	2.47	30.55	3.96	-34.64
N+2.00	B118	ENVOLVENTE MAX	0.4	59.95	-23.15	2.47	30.55	3.549	-29.922
N+2.00	B118	ENVOLVENTE MAX	0.6	59.95	-22.29	2.47	30.55	3.166	-25.376
N+2.00	B118	ENVOLVENTE MAX	0.8	59.95	-21.42	2.47	30.55	2.825	-21.001
N+2.00	B118	ENVOLVENTE MAX	1	59.95	-20.56	2.47	30.55	2.535	-16.798
N+2.00	B118	ENVOLVENTE MAX	1.2	59.95	-19.69	2.47	30.55	2.309	-12.765
N+2.00	B118	ENVOLVENTE MAX	1.4	59.95	-18.83	2.47	30.55	2.163	-8.901
N+2.00	B118	ENVOLVENTE MAX	1.6	59.95	-17.97	2.47	30.55	2.127	-5.199
N+2.00	B118	ENVOLVENTE MAX	1.8	59.95	-17.1	2.47	30.55	2.227	-1.637
N+2.00	B118	ENVOLVENTE MAX	2	59.95	-16.24	2.47	30.55	2.507	3.268
N+2.00	B118	ENVOLVENTE MIN	0	-53.05	-91.92	-2.64	-8.935	-4.201	-169.525
N+2.00	B118	ENVOLVENTE MIN	0.2	-53.05	-90.77	-2.64	-8.935	-3.736	-151.255
N+2.00	B118	ENVOLVENTE MIN	0.4	-53.05	-89.62	-2.64	-8.935	-3.29	-133.216
N+2.00	B118	ENVOLVENTE MIN	0.6	-53.05	-88.47	-2.64	-8.935	-2.873	-115.407
N+2.00	B118	ENVOLVENTE MIN	0.8	-53.05	-87.32	-2.64	-8.935	-2.496	-97.829
N+2.00	B118	ENVOLVENTE MIN	1	-53.05	-86.16	-2.64	-8.935	-2.171	-80.481
N+2.00	B118	ENVOLVENTE MIN	1.2	-53.05	-85.01	-2.64	-8.935	-1.91	-63.363
N+2.00	B118	ENVOLVENTE MIN	1.4	-53.05	-83.86	-2.64	-8.935	-1.729	-46.476
N+2.00	B118	ENVOLVENTE MIN	1.6	-53.05	-82.71	-2.64	-8.935	-1.657	-29.819
N+2.00	B118	ENVOLVENTE MIN	1.8	-53.05	-81.56	-2.64	-8.935	-1.723	-13.488
N+2.00	B118	ENVOLVENTE MIN	2	-53.05	-80.4	-2.64	-8.935	-1.967	-0.014
N+2.00	B119	ENVOLVENTE MAX	0	21.96	3.22	0.14	-0.171	0.249	-0.199
N+2.00	B119	ENVOLVENTE MAX	0.2	21.96	3.65	0.14	-0.171	0.229	-0.443
N+2.00	B119	ENVOLVENTE MAX	0.4	21.96	4.08	0.14	-0.171	0.211	-0.7
N+2.00	B119	ENVOLVENTE MAX	0.6	21.96	4.52	0.14	-0.171	0.195	-0.932
N+2.00	B119	ENVOLVENTE MAX	0.8	21.96	4.95	0.14	-0.171	0.181	-0.918
N+2.00	B119	ENVOLVENTE MAX	1	21.96	5.38	0.14	-0.171	0.171	-0.905
N+2.00	B119	ENVOLVENTE MAX	1.2	21.96	5.81	0.14	-0.171	0.164	-0.929
N+2.00	B119	ENVOLVENTE MAX	1.4	21.96	6.24	0.14	-0.171	0.161	-0.999
N+2.00	B119	ENVOLVENTE MAX	1.6	21.96	6.68	0.14	-0.171	0.163	-1.119
N+2.00	B119	ENVOLVENTE MAX	1.8	21.96	7.11	0.14	-0.171	0.169	-1.294
N+2.00	B119	ENVOLVENTE MAX	2	21.96	7.54	0.14	-0.171	0.178	-1.526
N+2.00	B119	ENVOLVENTE MIN	0	-26.24	-2	-0.12	-3.584	-0.212	-4.306
N+2.00	B119	ENVOLVENTE MIN	0.2	-26.24	-1.68	-0.12	-3.584	-0.197	-4.38
N+2.00	B119	ENVOLVENTE MIN	0.4	-26.24	-1.36	-0.12	-3.584	-0.184	-4.761
N+2.00	B119	ENVOLVENTE MIN	0.6	-26.24	-1.03	-0.12	-3.584	-0.173	-5.327
N+2.00	B119	ENVOLVENTE MIN	0.8	-26.24	-0.71	-0.12	-3.584	-0.165	-5.979
N+2.00	B119	ENVOLVENTE MIN	1	-26.24	-0.38	-0.12	-3.584	-0.16	-6.718
N+2.00	B119	ENVOLVENTE MIN	1.2	-26.24	-0.06	-0.12	-3.584	-0.157	-7.756
N+2.00	B119	ENVOLVENTE MIN	1.4	-26.24	0.26	-0.12	-3.584	-0.16	-8.912

N+2.00	B120	ENVOLVENTE MAX	0.45	45.47	1.64	1.99	0.758	0.385	-1.806
N+2.00	B120	ENVOLVENTE MAX	0.5	45.47	1.72	1.99	0.758	0.481	-1.782
N+2.00	B120	ENVOLVENTE MIN	0	-54.05	-2.35	-2.24	-1	-0.725	-13.628
N+2.00	B120	ENVOLVENTE MIN	0.05	-54.05	-2.24	-2.24	-1	-0.619	-13.606
N+2.00	B120	ENVOLVENTE MIN	0.1	-54.05	-2.13	-2.24	-1	-0.514	-13.592
N+2.00	B120	ENVOLVENTE MIN	0.15	-54.05	-2.02	-2.24	-1	-0.414	-13.584
N+2.00	B120	ENVOLVENTE MIN	0.2	-54.05	-1.91	-2.24	-1	-0.322	-13.583
N+2.00	B120	ENVOLVENTE MIN	0.25	-54.05	-1.81	-2.24	-1	-0.25	-13.59
N+2.00	B120	ENVOLVENTE MIN	0.3	-54.05	-1.7	-2.24	-1	-0.212	-13.604
N+2.00	B120	ENVOLVENTE MIN	0.35	-54.05	-1.59	-2.24	-1	-0.22	-13.624
N+2.00	B120	ENVOLVENTE MIN	0.4	-54.05	-1.48	-2.24	-1	-0.268	-13.652
N+2.00	B120	ENVOLVENTE MIN	0.45	-54.05	-1.37	-2.24	-1	-0.339	-13.687
N+2.00	B120	ENVOLVENTE MIN	0.5	-54.05	-1.27	-2.24	-1	-0.422	-13.729
N+2.00	B121	ENVOLVENTE MAX	0	21.29	-1.79	0.16	3.127	0.201	-1.61
N+2.00	B121	ENVOLVENTE MAX	0.2	21.29	-1.46	0.16	3.127	0.173	-1.268
N+2.00	B121	ENVOLVENTE MAX	0.4	21.29	-1.14	0.16	3.127	0.148	-0.986
N+2.00	B121	ENVOLVENTE MAX	0.6	21.29	-0.82	0.16	3.127	0.124	-0.762
N+2.00	B121	ENVOLVENTE MAX	0.8	21.29	-0.49	0.16	3.127	0.105	-0.59
N+2.00	B121	ENVOLVENTE MAX	1	21.29	-0.17	0.16	3.127	0.093	-0.463
N+2.00	B121	ENVOLVENTE MAX	1.2	21.29	0.16	0.16	3.127	0.09	-0.369
N+2.00	B121	ENVOLVENTE MAX	1.4	21.29	0.48	0.16	3.127	0.097	-0.298
N+2.00	B121	ENVOLVENTE MAX	1.6	21.29	0.8	0.16	3.127	0.114	-0.239
N+2.00	B121	ENVOLVENTE MAX	1.8	21.29	1.13	0.16	3.127	0.138	-0.175
N+2.00	B121	ENVOLVENTE MAX	2	21.29	1.45	0.16	3.127	0.166	0.044
N+2.00	B121	ENVOLVENTE MIN	0	-24.96	-7.56	-0.18	-0.062	-0.251	-13.197
N+2.00	B121	ENVOLVENTE MIN	0.2	-24.96	-7.13	-0.18	-0.062	-0.219	-11.744
N+2.00	B121	ENVOLVENTE MIN	0.4	-24.96	-6.7	-0.18	-0.062	-0.188	-10.383
N+2.00	B121	ENVOLVENTE MIN	0.6	-24.96	-6.27	-0.18	-0.062	-0.159	-9.115
N+2.00	B121	ENVOLVENTE MIN	0.8	-24.96	-5.83	-0.18	-0.062	-0.135	-7.947
N+2.00	B121	ENVOLVENTE MIN	1	-24.96	-5.4	-0.18	-0.062	-0.118	-6.884
N+2.00	B121	ENVOLVENTE MIN	1.2	-24.96	-4.97	-0.18	-0.062	-0.11	-5.94
N+2.00	B121	ENVOLVENTE MIN	1.4	-24.96	-4.54	-0.18	-0.062	-0.112	-5.125
N+2.00	B121	ENVOLVENTE MIN	1.6	-24.96	-4.11	-0.18	-0.062	-0.124	-4.448
N+2.00	B121	ENVOLVENTE MIN	1.8	-24.96	-3.67	-0.18	-0.062	-0.143	-3.927
N+2.00	B121	ENVOLVENTE MIN	2	-24.96	-3.24	-0.18	-0.062	-0.166	-3.713
N+2.66	B122	ENVOLVENTE MAX	0	59.9	120.42	7.53	9.508	5.95	6.938
N+2.66	B122	ENVOLVENTE MAX	0.2	59.9	121.57	7.53	9.508	7.712	-2.496
N+2.66	B122	ENVOLVENTE MAX	0.4	59.9	122.72	7.53	9.508	9.56	-8.058
N+2.66	B122	ENVOLVENTE MAX	0.6	59.9	123.88	7.53	9.508	11.435	-13.791
N+2.66	B122	ENVOLVENTE MAX	0.8	59.9	125.03	7.53	9.508	13.325	-19.696
N+2.66	B122	ENVOLVENTE MAX	1	59.9	126.18	7.53	9.508	15.225	-25.774
N+2.66	B122	ENVOLVENTE MAX	1.2	59.9	127.33	7.53	9.508	17.131	-32.024
N+2.66	B122	ENVOLVENTE MAX	1.4	59.9	128.48	7.53	9.508	19.042	-38.446
N+2.66	B122	ENVOLVENTE MAX	1.6	59.9	129.64	7.53	9.508	20.956	-45.042
N+2.66	B122	ENVOLVENTE MAX	1.8	59.9	130.79	7.53	9.508	22.872	-51.81
N+2.66	B122	ENVOLVENTE MAX	2	59.9	131.94	7.53	9.508	24.79	-58.752
N+2.66	B122	ENVOLVENTE MIN	0	-59.81	26.5	-9.64	-31.498	-4.53	2.041
N+2.66	B122	ENVOLVENTE MIN	0.2	-59.81	27.36	-9.64	-31.498	-5.868	-17.261
N+2.66	B122	ENVOLVENTE MIN	0.4	-59.81	28.23	-9.64	-31.498	-7.293	-41.69
N+2.66	B122	ENVOLVENTE MIN	0.6	-59.81	29.09	-9.64	-31.498	-8.746	-66.35
N+2.66	B122	ENVOLVENTE MIN	0.8	-59.81	29.95	-9.64	-31.498	-10.213	-91.241
N+2.66	B122	ENVOLVENTE MIN	1	-59.81	30.82	-9.64	-31.498	-11.69	-116.361
N+2.66	B122	ENVOLVENTE MIN	1.2	-59.81	31.68	-9.64	-31.498	-13.173	-141.713
N+2.66	B122	ENVOLVENTE MIN	1.4	-59.81	32.55	-9.64	-31.498	-14.661	-167.294
N+2.66	B122	ENVOLVENTE MIN	1.6	-59.81	33.41	-9.64	-31.498	-16.152	-193.106
N+2.66	B122	ENVOLVENTE MIN	1.8	-59.81	34.27	-9.64	-31.498	-17.646	-219.149
N+2.66	B122	ENVOLVENTE MIN	2	-59.81	35.14	-9.64	-31.498	-19.141	-245.421
N+2.66	B123	ENVOLVENTE MAX	0	164.91	266	91.06	48.009	51.466	-61.649
N+2.66	B123	ENVOLVENTE MAX	0.025	164.91	266.14	91.06	48.009	50.556	-63.738
N+2.66	B123	ENVOLVENTE MAX	0.05	164.91	266.29	91.06	48.009	49.741	-65.829
N+2.66	B123	ENVOLVENTE MAX	0.075	164.91	266.43	91.06	48.009	49.022	-67.923
N+2.66	B123	ENVOLVENTE MAX	0.1	164.91	266.58	91.06	48.009	48.405	-70.018
N+2.66	B123	ENVOLVENTE MAX	0.125	164.91	266.72	91.06	48.009	47.893	-72.116
N+2.66	B123	ENVOLVENTE MAX	0.15	164.91	266.86	91.06	48.009	47.486	-74.215
N+2.66	B123	ENVOLVENTE MAX	0.175	164.91	267.01	91.06	48.009	47.187	-76.317
N+2.66	B123	ENVOLVENTE MAX	0.2	164.91	267.15	91.06	48.009	46.994	-78.421
N+2.66	B123	ENVOLVENTE MAX	0.225	164.91	267.3	91.06	48.009	46.908	-80.527
N+2.66	B123	ENVOLVENTE MAX	0.25	164.91	267.44	91.06	48.009	46.926	-82.635

N+2.66	B124	ENVOLVENTE MAX	0	5.63	1.97	0.27	0.799	0.571	0.849
N+2.66	B124	ENVOLVENTE MAX	0.2	5.63	2.4	0.27	0.799	0.56	0.635
N+2.66	B124	ENVOLVENTE MAX	0.4	5.63	2.83	0.27	0.799	0.553	0.358
N+2.66	B124	ENVOLVENTE MAX	0.6	5.63	3.26	0.27	0.799	0.548	0.019
N+2.66	B124	ENVOLVENTE MAX	0.8	5.63	3.69	0.27	0.799	0.547	-0.379
N+2.66	B124	ENVOLVENTE MAX	1	5.63	4.13	0.27	0.799	0.55	-0.833
N+2.66	B124	ENVOLVENTE MAX	1.2	5.63	4.56	0.27	0.799	0.561	-1.33
N+2.66	B124	ENVOLVENTE MAX	1.4	5.63	4.99	0.27	0.799	0.576	-1.795
N+2.66	B124	ENVOLVENTE MAX	1.6	5.63	5.42	0.27	0.799	0.596	-2.172
N+2.66	B124	ENVOLVENTE MAX	1.8	5.63	5.85	0.27	0.799	0.62	-2.524
N+2.66	B124	ENVOLVENTE MAX	2	5.63	6.29	0.27	0.799	0.648	-2.898
N+2.66	B124	ENVOLVENTE MIN	0	-4.18	-1.67	-0.28	-2.935	-0.734	-4.491
N+2.66	B124	ENVOLVENTE MIN	0.2	-4.18	-1.35	-0.28	-2.935	-0.72	-4.412
N+2.66	B124	ENVOLVENTE MIN	0.4	-4.18	-1.03	-0.28	-2.935	-0.71	-4.42
N+2.66	B124	ENVOLVENTE MIN	0.6	-4.18	-0.7	-0.28	-2.935	-0.703	-4.517
N+2.66	B124	ENVOLVENTE MIN	0.8	-4.18	-0.38	-0.28	-2.935	-0.698	-4.885
N+2.66	B124	ENVOLVENTE MIN	1	-4.18	-0.05	-0.28	-2.935	-0.698	-5.545
N+2.66	B124	ENVOLVENTE MIN	1.2	-4.18	0.27	-0.28	-2.935	-0.706	-6.292
N+2.66	B124	ENVOLVENTE MIN	1.4	-4.18	0.59	-0.28	-2.935	-0.719	-7.125
N+2.66	B124	ENVOLVENTE MIN	1.6	-4.18	0.92	-0.28	-2.935	-0.737	-8.044
N+2.66	B124	ENVOLVENTE MIN	1.8	-4.18	1.24	-0.28	-2.935	-0.758	-9.05
N+2.66	B124	ENVOLVENTE MIN	2	-4.18	1.57	-0.28	-2.935	-0.782	-10.142
N+2.66	B126	ENVOLVENTE MAX	0	6.27	2.31	0.41	1.459	0.737	1.796
N+2.66	B126	ENVOLVENTE MAX	0.2	6.27	2.74	0.41	1.459	0.673	1.426
N+2.66	B126	ENVOLVENTE MAX	0.4	6.27	3.17	0.41	1.459	0.613	0.992
N+2.66	B126	ENVOLVENTE MAX	0.6	6.27	3.6	0.41	1.459	0.558	0.495
N+2.66	B126	ENVOLVENTE MAX	0.8	6.27	4.04	0.41	1.459	0.511	-0.062
N+2.66	B126	ENVOLVENTE MAX	1	6.27	4.47	0.41	1.459	0.486	-0.672
N+2.66	B126	ENVOLVENTE MAX	1.2	6.27	4.9	0.41	1.459	0.465	-1.237
N+2.66	B126	ENVOLVENTE MAX	1.4	6.27	5.33	0.41	1.459	0.452	-1.511
N+2.66	B126	ENVOLVENTE MAX	1.6	6.27	5.76	0.41	1.459	0.446	-1.496
N+2.66	B126	ENVOLVENTE MAX	1.8	6.27	6.2	0.41	1.459	0.469	-1.458
N+2.66	B126	ENVOLVENTE MAX	2	6.27	6.63	0.41	1.459	0.506	-1.474
N+2.66	B126	ENVOLVENTE MIN	0	-7.51	-3.05	-0.48	-3.403	-0.967	-6.005
N+2.66	B126	ENVOLVENTE MIN	0.2	-7.51	-2.72	-0.48	-3.403	-0.887	-5.562
N+2.66	B126	ENVOLVENTE MIN	0.4	-7.51	-2.4	-0.48	-3.403	-0.811	-5.207
N+2.66	B126	ENVOLVENTE MIN	0.6	-7.51	-2.07	-0.48	-3.403	-0.741	-4.941
N+2.66	B126	ENVOLVENTE MIN	0.8	-7.51	-1.75	-0.48	-3.403	-0.679	-4.765
N+2.66	B126	ENVOLVENTE MIN	1	-7.51	-1.43	-0.48	-3.403	-0.638	-5.149
N+2.66	B126	ENVOLVENTE MIN	1.2	-7.51	-1.1	-0.48	-3.403	-0.603	-5.709
N+2.66	B126	ENVOLVENTE MIN	1.4	-7.51	-0.78	-0.48	-3.403	-0.574	-6.356
N+2.66	B126	ENVOLVENTE MIN	1.6	-7.51	-0.45	-0.48	-3.403	-0.553	-7.09
N+2.66	B126	ENVOLVENTE MIN	1.8	-7.51	-0.13	-0.48	-3.403	-0.561	-7.91
N+2.66	B126	ENVOLVENTE MIN	2	-7.51	0.19	-0.48	-3.403	-0.583	-8.816
N+3.33	B128	ENVOLVENTE MAX	0	50.33	116.42	9.36	35.586	5.786	7.283
N+3.33	B128	ENVOLVENTE MAX	0.2	50.33	117.57	9.36	35.586	7.583	-0.468
N+3.33	B128	ENVOLVENTE MAX	0.4	50.33	118.72	9.36	35.586	9.459	-4.412
N+3.33	B128	ENVOLVENTE MAX	0.6	50.33	119.87	9.36	35.586	11.367	-8.528
N+3.33	B128	ENVOLVENTE MAX	0.8	50.33	121.02	9.36	35.586	13.29	-12.817
N+3.33	B128	ENVOLVENTE MAX	1	50.33	122.18	9.36	35.586	15.222	-17.278
N+3.33	B128	ENVOLVENTE MAX	1.2	50.33	123.33	9.36	35.586	17.167	-21.912
N+3.33	B128	ENVOLVENTE MAX	1.4	50.33	124.48	9.36	35.586	19.386	-26.719
N+3.33	B128	ENVOLVENTE MAX	1.6	50.33	125.63	9.36	35.586	21.61	-31.698
N+3.33	B128	ENVOLVENTE MAX	1.8	50.33	126.78	9.36	35.586	23.838	-36.851
N+3.33	B128	ENVOLVENTE MAX	2	50.33	127.94	9.36	35.586	26.069	-42.176
N+3.33	B128	ENVOLVENTE MIN	0	-50.85	18.42	-11.22	-29.73	-4.983	1.924
N+3.33	B128	ENVOLVENTE MIN	0.2	-50.85	19.28	-11.22	-29.73	-6.408	-17.606
N+3.33	B128	ENVOLVENTE MIN	0.4	-50.85	20.15	-11.22	-29.73	-7.912	-40.624
N+3.33	B128	ENVOLVENTE MIN	0.6	-50.85	21.01	-11.22	-29.73	-9.447	-63.874
N+3.33	B128	ENVOLVENTE MIN	0.8	-50.85	21.87	-11.22	-29.73	-10.999	-87.693
N+3.33	B128	ENVOLVENTE MIN	1	-50.85	22.74	-11.22	-29.73	-12.559	-112.013
N+3.33	B128	ENVOLVENTE MIN	1.2	-50.85	23.6	-11.22	-29.73	-14.131	-136.563
N+3.33	B128	ENVOLVENTE MIN	1.4	-50.85	24.47	-11.22	-29.73	-15.978	-161.344
N+3.33	B128	ENVOLVENTE MIN	1.6	-50.85	25.33	-11.22	-29.73	-17.83	-186.355
N+3.33	B128	ENVOLVENTE MIN	1.8	-50.85	26.19	-11.22	-29.73	-19.685	-211.597
N+3.33	B128	ENVOLVENTE MIN	2	-50.85	27.06	-11.22	-29.73	-21.544	-237.069
N+3.33	B129	ENVOLVENTE MAX	0	137.3	263.14	47.4	80.439	51.261	-42.864

N+3.33	B129	ENVOLVENTE MIN	0.05	-139.02	79.05	-64.51	-56.566	-40.627	-266.886
N+3.33	B129	ENVOLVENTE MIN	0.075	-139.02	79.16	-64.51	-56.566	-40.042	-273.474
N+3.33	B129	ENVOLVENTE MIN	0.1	-139.02	79.27	-64.51	-56.566	-39.692	-280.065
N+3.33	B129	ENVOLVENTE MIN	0.125	-139.02	79.38	-64.51	-56.566	-39.36	-286.66
N+3.33	B129	ENVOLVENTE MIN	0.15	-139.02	79.49	-64.51	-56.566	-39.045	-293.258
N+3.33	B129	ENVOLVENTE MIN	0.175	-139.02	79.59	-64.51	-56.566	-38.748	-299.86
N+3.33	B129	ENVOLVENTE MIN	0.2	-139.02	79.7	-64.51	-56.566	-38.47	-306.465
N+3.33	B129	ENVOLVENTE MIN	0.225	-139.02	79.81	-64.51	-56.566	-38.21	-313.074
N+3.33	B129	ENVOLVENTE MIN	0.25	-139.02	79.92	-64.51	-56.566	-37.97	-319.687
N+3.33	B130	ENVOLVENTE MAX	0	6.97	3	0.29	2.495	0.678	2.262
N+3.33	B130	ENVOLVENTE MAX	0.2	6.97	3.43	0.29	2.495	0.648	1.891
N+3.33	B130	ENVOLVENTE MAX	0.4	6.97	3.86	0.29	2.495	0.623	1.456
N+3.33	B130	ENVOLVENTE MAX	0.6	6.97	4.29	0.29	2.495	0.603	0.959
N+3.33	B130	ENVOLVENTE MAX	0.8	6.97	4.73	0.29	2.495	0.589	0.402
N+3.33	B130	ENVOLVENTE MAX	1	6.97	5.16	0.29	2.495	0.581	-0.21
N+3.33	B130	ENVOLVENTE MAX	1.2	6.97	5.59	0.29	2.495	0.579	-0.863
N+3.33	B130	ENVOLVENTE MAX	1.4	6.97	6.02	0.29	2.495	0.588	-1.535
N+3.33	B130	ENVOLVENTE MAX	1.6	6.97	6.45	0.29	2.495	0.614	-2.143
N+3.33	B130	ENVOLVENTE MAX	1.8	6.97	6.89	0.29	2.495	0.646	-2.509
N+3.33	B130	ENVOLVENTE MAX	2	6.97	7.32	0.29	2.495	0.683	-2.788
N+3.33	B130	ENVOLVENTE MIN	0	-5.7	-1.96	-0.41	-2.853	-0.904	-4.419
N+3.33	B130	ENVOLVENTE MIN	0.2	-5.7	-1.64	-0.41	-2.853	-0.851	-4.331
N+3.33	B130	ENVOLVENTE MIN	0.4	-5.7	-1.31	-0.41	-2.853	-0.804	-4.33
N+3.33	B130	ENVOLVENTE MIN	0.6	-5.7	-0.99	-0.41	-2.853	-0.761	-4.419
N+3.33	B130	ENVOLVENTE MIN	0.8	-5.7	-0.67	-0.41	-2.853	-0.724	-4.598
N+3.33	B130	ENVOLVENTE MIN	1	-5.7	-0.34	-0.41	-2.853	-0.693	-4.927
N+3.33	B130	ENVOLVENTE MIN	1.2	-5.7	-0.02	-0.41	-2.853	-0.669	-5.794
N+3.33	B130	ENVOLVENTE MIN	1.4	-5.7	0.31	-0.41	-2.853	-0.654	-6.748
N+3.33	B130	ENVOLVENTE MIN	1.6	-5.7	0.63	-0.41	-2.853	-0.658	-7.788
N+3.33	B130	ENVOLVENTE MIN	1.8	-5.7	0.95	-0.41	-2.853	-0.667	-8.914
N+3.33	B130	ENVOLVENTE MIN	2	-5.7	1.28	-0.41	-2.853	-0.682	-10.127
N+3.33	B132	ENVOLVENTE MAX	0	5.5	4.78	0.76	4.702	0.826	3.72
N+3.33	B132	ENVOLVENTE MAX	0.2	5.5	5.21	0.76	4.702	0.742	3.009
N+3.33	B132	ENVOLVENTE MAX	0.4	5.5	5.65	0.76	4.702	0.671	2.234
N+3.33	B132	ENVOLVENTE MAX	0.6	5.5	6.08	0.76	4.702	0.62	1.395
N+3.33	B132	ENVOLVENTE MAX	0.8	5.5	6.51	0.76	4.702	0.585	0.497
N+3.33	B132	ENVOLVENTE MAX	1	5.5	6.94	0.76	4.702	0.556	-0.453
N+3.33	B132	ENVOLVENTE MAX	1.2	5.5	7.37	0.76	4.702	0.601	-1.377
N+3.33	B132	ENVOLVENTE MAX	1.4	5.5	7.81	0.76	4.702	0.693	-1.698
N+3.33	B132	ENVOLVENTE MAX	1.6	5.5	8.24	0.76	4.702	0.786	-1.553
N+3.33	B132	ENVOLVENTE MAX	1.8	5.5	8.67	0.76	4.702	0.882	-1.421
N+3.33	B132	ENVOLVENTE MAX	2	5.5	9.1	0.76	4.702	0.978	-1.344
N+3.33	B132	ENVOLVENTE MIN	0	-6.77	-3.51	-0.65	-3.846	-0.821	-6.084
N+3.33	B132	ENVOLVENTE MIN	0.2	-6.77	-3.18	-0.65	-3.846	-0.76	-5.703
N+3.33	B132	ENVOLVENTE MIN	0.4	-6.77	-2.86	-0.65	-3.846	-0.713	-5.41
N+3.33	B132	ENVOLVENTE MIN	0.6	-6.77	-2.53	-0.65	-3.846	-0.686	-5.205
N+3.33	B132	ENVOLVENTE MIN	0.8	-6.77	-2.21	-0.65	-3.846	-0.674	-5.091
N+3.33	B132	ENVOLVENTE MIN	1	-6.77	-1.89	-0.65	-3.846	-0.669	-5.308
N+3.33	B132	ENVOLVENTE MIN	1.2	-6.77	-1.56	-0.65	-3.846	-0.737	-6.215
N+3.33	B132	ENVOLVENTE MIN	1.4	-6.77	-1.24	-0.65	-3.846	-0.852	-7.209
N+3.33	B132	ENVOLVENTE MIN	1.6	-6.77	-0.91	-0.65	-3.846	-0.969	-8.29
N+3.33	B132	ENVOLVENTE MIN	1.8	-6.77	-0.59	-0.65	-3.846	-1.088	-9.457
N+3.33	B132	ENVOLVENTE MIN	2	-6.77	-0.27	-0.65	-3.846	-1.207	-11.133
N+4.00	B134	ENVOLVENTE MAX	0	69.9	94.11	4.14	66.416	10.273	7.756
N+4.00	B134	ENVOLVENTE MAX	0.2	69.9	95.26	4.14	66.416	10.091	3.455
N+4.00	B134	ENVOLVENTE MAX	0.4	69.9	96.41	4.14	66.416	9.95	1.351
N+4.00	B134	ENVOLVENTE MAX	0.6	69.9	97.56	4.14	66.416	9.852	-0.914
N+4.00	B134	ENVOLVENTE MAX	0.8	69.9	98.72	4.14	66.416	9.798	-3.35
N+4.00	B134	ENVOLVENTE MAX	1	69.9	99.87	4.14	66.416	9.791	-5.957
N+4.00	B134	ENVOLVENTE MAX	1.2	69.9	101.02	4.14	66.416	9.835	-8.735
N+4.00	B134	ENVOLVENTE MAX	1.4	69.9	102.17	4.14	66.416	9.938	-11.686
N+4.00	B134	ENVOLVENTE MAX	1.6	69.9	103.32	4.14	66.416	10.108	-14.81
N+4.00	B134	ENVOLVENTE MAX	1.8	69.9	104.48	4.14	66.416	10.355	-18.106
N+4.00	B134	ENVOLVENTE MAX	2	69.9	105.63	4.14	66.416	10.681	-21.575
N+4.00	B134	ENVOLVENTE MIN	0	-68.8	9.13	-4.38	-18.432	-8.772	-2.031
N+4.00	B134	ENVOLVENTE MIN	0.2	-68.8	10	-4.38	-18.432	-8.542	-18.58
N+4.00	B134	ENVOLVENTE MIN	0.4	-68.8	10.86	-4.38	-18.432	-8.353	-37.73

N+4.00	B136	ENVOLVENTE MAX	0.8	29.17	5.67	0.34	6.598	0.511	-1.967
N+4.00	B136	ENVOLVENTE MAX	1	29.17	6.1	0.34	6.598	0.575	-1.803
N+4.00	B136	ENVOLVENTE MAX	1.2	29.17	6.53	0.34	6.598	0.641	-1.679
N+4.00	B136	ENVOLVENTE MAX	1.4	29.17	6.96	0.34	6.598	0.706	-1.615
N+4.00	B136	ENVOLVENTE MAX	1.6	29.17	7.39	0.34	6.598	0.773	-1.486
N+4.00	B136	ENVOLVENTE MAX	1.8	29.17	7.83	0.34	6.598	0.84	-1.408
N+4.00	B136	ENVOLVENTE MAX	2	29.17	8.26	0.34	6.598	0.907	-1.394
N+4.00	B136	ENVOLVENTE MIN	0	-29.7	-3.16	-0.35	0.961	-0.363	-7.494
N+4.00	B136	ENVOLVENTE MIN	0.2	-29.7	-2.83	-0.35	0.961	-0.416	-7.089
N+4.00	B136	ENVOLVENTE MIN	0.4	-29.7	-2.51	-0.35	0.961	-0.474	-7.368
N+4.00	B136	ENVOLVENTE MIN	0.6	-29.7	-2.19	-0.35	0.961	-0.535	-7.844
N+4.00	B136	ENVOLVENTE MIN	0.8	-29.7	-1.86	-0.35	0.961	-0.598	-8.407
N+4.00	B136	ENVOLVENTE MIN	1	-29.7	-1.54	-0.35	0.961	-0.662	-9.055
N+4.00	B136	ENVOLVENTE MIN	1.2	-29.7	-1.21	-0.35	0.961	-0.727	-9.79
N+4.00	B136	ENVOLVENTE MIN	1.4	-29.7	-0.89	-0.35	0.961	-0.793	-10.911
N+4.00	B136	ENVOLVENTE MIN	1.6	-29.7	-0.57	-0.35	0.961	-0.859	-12.33
N+4.00	B136	ENVOLVENTE MIN	1.8	-29.7	-0.24	-0.35	0.961	-0.926	-13.849
N+4.00	B136	ENVOLVENTE MIN	2	-29.7	0.08	-0.35	0.961	-0.993	-15.456
N+4.00	B137	ENVOLVENTE MAX	0	32	-3.96	0.06	1.627	0.373	-3.984
N+4.00	B137	ENVOLVENTE MAX	0.295	32	-3.48	0.06	1.627	0.385	-2.887
N+4.00	B137	ENVOLVENTE MAX	0.59	32	-3	0.06	1.627	0.398	-1.931
N+4.00	B137	ENVOLVENTE MAX	0.885	32	-2.52	0.06	1.627	0.411	-1.115
N+4.00	B137	ENVOLVENTE MAX	1.18	32	-2.05	0.06	1.627	0.425	-0.441
N+4.00	B137	ENVOLVENTE MAX	1.475	32	-1.57	0.06	1.627	0.438	0.092
N+4.00	B137	ENVOLVENTE MAX	1.77	32	-1.09	0.06	1.627	0.452	0.485
N+4.00	B137	ENVOLVENTE MAX	2.065	32	-0.61	0.06	1.627	0.466	0.736
N+4.00	B137	ENVOLVENTE MAX	2.36	32	-0.13	0.06	1.627	0.481	0.847
N+4.00	B137	ENVOLVENTE MAX	2.655	32	0.34	0.06	1.627	0.495	0.817
N+4.00	B137	ENVOLVENTE MAX	2.95	32	0.82	0.06	1.627	0.51	0.929
N+4.00	B137	ENVOLVENTE MIN	0	-32.4	-9.34	-0.06	-0.563	-0.31	-17.636
N+4.00	B137	ENVOLVENTE MIN	0.295	-32.4	-8.71	-0.06	-0.563	-0.323	-14.976
N+4.00	B137	ENVOLVENTE MIN	0.59	-32.4	-8.07	-0.06	-0.563	-0.337	-12.579
N+4.00	B137	ENVOLVENTE MIN	0.885	-32.4	-7.43	-0.06	-0.563	-0.35	-10.37
N+4.00	B137	ENVOLVENTE MIN	1.18	-32.4	-6.79	-0.06	-0.563	-0.364	-8.349
N+4.00	B137	ENVOLVENTE MIN	1.475	-32.4	-6.16	-0.06	-0.563	-0.378	-6.515
N+4.00	B137	ENVOLVENTE MIN	1.77	-32.4	-5.52	-0.06	-0.563	-0.393	-4.87
N+4.00	B137	ENVOLVENTE MIN	2.065	-32.4	-4.88	-0.06	-0.563	-0.408	-3.413
N+4.00	B137	ENVOLVENTE MIN	2.36	-32.4	-4.25	-0.06	-0.563	-0.422	-2.144
N+4.00	B137	ENVOLVENTE MIN	2.655	-32.4	-3.61	-0.06	-0.563	-0.437	-1.064
N+4.00	B137	ENVOLVENTE MIN	2.95	-32.4	-2.97	-0.06	-0.563	-0.453	-0.454
N+4.00	B138	ENVOLVENTE MAX	0	76.12	251.67	0.25	61.45	11.504	-16.081
N+4.00	B138	ENVOLVENTE MAX	0.025	76.12	251.82	0.25	61.45	11.498	-18.216
N+4.00	B138	ENVOLVENTE MAX	0.05	76.12	251.96	0.25	61.45	11.492	-20.351
N+4.00	B138	ENVOLVENTE MAX	0.075	76.12	252.11	0.25	61.45	11.486	-22.483
N+4.00	B138	ENVOLVENTE MAX	0.1	76.12	252.25	0.25	61.45	11.48	-24.614
N+4.00	B138	ENVOLVENTE MAX	0.125	76.12	252.39	0.25	61.45	11.474	-26.744
N+4.00	B138	ENVOLVENTE MAX	0.15	76.12	252.54	0.25	61.45	11.468	-28.871
N+4.00	B138	ENVOLVENTE MAX	0.175	76.12	252.68	0.25	61.45	11.462	-30.996
N+4.00	B138	ENVOLVENTE MAX	0.2	76.12	252.83	0.25	61.45	11.455	-33.119
N+4.00	B138	ENVOLVENTE MAX	0.225	76.12	252.97	0.25	61.45	11.449	-35.239
N+4.00	B138	ENVOLVENTE MAX	0.25	76.12	253.11	0.25	61.45	11.443	-37.357
N+4.00	B138	ENVOLVENTE MIN	0	-75.26	68.63	-0.24	-39.642	-12.585	-203.217
N+4.00	B138	ENVOLVENTE MIN	0.025	-75.26	68.74	-0.24	-39.642	-12.579	-208.344
N+4.00	B138	ENVOLVENTE MIN	0.05	-75.26	68.85	-0.24	-39.642	-12.573	-213.479
N+4.00	B138	ENVOLVENTE MIN	0.075	-75.26	68.95	-0.24	-39.642	-12.567	-218.622
N+4.00	B138	ENVOLVENTE MIN	0.1	-75.26	69.06	-0.24	-39.642	-12.561	-223.773
N+4.00	B138	ENVOLVENTE MIN	0.125	-75.26	69.17	-0.24	-39.642	-12.556	-228.932
N+4.00	B138	ENVOLVENTE MIN	0.15	-75.26	69.28	-0.24	-39.642	-12.55	-234.099
N+4.00	B138	ENVOLVENTE MIN	0.175	-75.26	69.39	-0.24	-39.642	-12.544	-239.275
N+4.00	B138	ENVOLVENTE MIN	0.2	-75.26	69.49	-0.24	-39.642	-12.538	-244.459
N+4.00	B138	ENVOLVENTE MIN	0.225	-75.26	69.6	-0.24	-39.642	-12.533	-249.652
N+4.00	B138	ENVOLVENTE MIN	0.25	-75.26	69.71	-0.24	-39.642	-12.527	-254.854
N+4.00	B139	ENVOLVENTE MAX	0	48.21	-24.62	2.12	42.898	11.966	-50.29
N+4.00	B139	ENVOLVENTE MAX	0.27	48.21	-23.46	2.12	42.898	11.416	-43.799
N+4.00	B139	ENVOLVENTE MAX	0.54	48.21	-22.29	2.12	42.898	10.868	-37.623
N+4.00	B139	ENVOLVENTE MAX	0.81	48.21	-21.13	2.12	42.898	10.324	-31.761
N+4.00	B139	ENVOLVENTE MAX	1.08	48.21	-19.96	2.12	42.898	9.782	-26.215

N+4.00	B139	ENVOLVENTE MIN	1.62	-47.55	-48.23	-2.17	14.11	-9.84	-49.26
N+4.00	B139	ENVOLVENTE MIN	1.89	-47.55	-46.68	-2.17	14.11	-9.299	-36.447
N+4.00	B139	ENVOLVENTE MIN	2.16	-47.55	-45.12	-2.17	14.11	-8.765	-24.054
N+4.00	B139	ENVOLVENTE MIN	2.43	-47.55	-43.57	-2.17	14.11	-8.238	-12.081
N+4.00	B139	ENVOLVENTE MIN	2.7	-47.55	-42.01	-2.17	14.11	-7.722	-0.929
N+2.00	B140	ENVOLVENTE MAX	0	80.98	194.42	8.38	24.73	15.52	-43.499
N+2.00	B140	ENVOLVENTE MAX	0.025	80.98	194.57	8.38	24.73	15.331	-45.104
N+2.00	B140	ENVOLVENTE MAX	0.05	80.98	194.71	8.38	24.73	15.143	-46.709
N+2.00	B140	ENVOLVENTE MAX	0.075	80.98	194.86	8.38	24.73	14.955	-48.259
N+2.00	B140	ENVOLVENTE MAX	0.1	80.98	195	8.38	24.73	14.768	-49.691
N+2.00	B140	ENVOLVENTE MAX	0.125	80.98	195.14	8.38	24.73	14.582	-51.121
N+2.00	B140	ENVOLVENTE MAX	0.15	80.98	195.29	8.38	24.73	14.396	-52.549
N+2.00	B140	ENVOLVENTE MAX	0.175	80.98	195.43	8.38	24.73	14.21	-53.974
N+2.00	B140	ENVOLVENTE MAX	0.2	80.98	195.58	8.38	24.73	14.026	-55.398
N+2.00	B140	ENVOLVENTE MAX	0.225	80.98	195.72	8.38	24.73	13.842	-56.82
N+2.00	B140	ENVOLVENTE MAX	0.25	80.98	195.86	8.38	24.73	13.658	-58.241
N+2.00	B140	ENVOLVENTE MIN	0	-67.91	51.23	-8.53	-58.502	-17.773	-183.697
N+2.00	B140	ENVOLVENTE MIN	0.025	-67.91	51.34	-8.53	-58.502	-17.58	-188.559
N+2.00	B140	ENVOLVENTE MIN	0.05	-67.91	51.45	-8.53	-58.502	-17.388	-193.425
N+2.00	B140	ENVOLVENTE MIN	0.075	-67.91	51.56	-8.53	-58.502	-17.197	-198.295
N+2.00	B140	ENVOLVENTE MIN	0.1	-67.91	51.66	-8.53	-58.502	-17.006	-203.168
N+2.00	B140	ENVOLVENTE MIN	0.125	-67.91	51.77	-8.53	-58.502	-16.815	-208.045
N+2.00	B140	ENVOLVENTE MIN	0.15	-67.91	51.88	-8.53	-58.502	-16.625	-212.925
N+2.00	B140	ENVOLVENTE MIN	0.175	-67.91	51.99	-8.53	-58.502	-16.436	-217.809
N+2.00	B140	ENVOLVENTE MIN	0.2	-67.91	52.1	-8.53	-58.502	-16.248	-222.697
N+2.00	B140	ENVOLVENTE MIN	0.225	-67.91	52.2	-8.53	-58.502	-16.06	-227.588
N+2.00	B140	ENVOLVENTE MIN	0.25	-67.91	52.31	-8.53	-58.502	-15.873	-232.483
N+2.00	B141	ENVOLVENTE MAX	0	96.77	-51.17	8.44	48.04	6.406	-53.861
N+2.00	B141	ENVOLVENTE MAX	0.025	96.77	-51.06	8.44	48.04	6.524	-52.358
N+2.00	B141	ENVOLVENTE MAX	0.05	96.77	-50.95	8.44	48.04	6.648	-50.851
N+2.00	B141	ENVOLVENTE MAX	0.075	96.77	-50.85	8.44	48.04	6.775	-49.34
N+2.00	B141	ENVOLVENTE MAX	0.1	96.77	-50.74	8.44	48.04	6.907	-47.824
N+2.00	B141	ENVOLVENTE MAX	0.125	96.77	-50.63	8.44	48.04	7.042	-46.305
N+2.00	B141	ENVOLVENTE MAX	0.15	96.77	-50.52	8.44	48.04	7.182	-44.781
N+2.00	B141	ENVOLVENTE MAX	0.175	96.77	-50.41	8.44	48.04	7.324	-43.253
N+2.00	B141	ENVOLVENTE MAX	0.2	96.77	-50.31	8.44	48.04	7.47	-41.719
N+2.00	B141	ENVOLVENTE MAX	0.225	96.77	-50.2	8.44	48.04	7.619	-40.181
N+2.00	B141	ENVOLVENTE MAX	0.25	96.77	-50.09	8.44	48.04	7.77	-38.638
N+2.00	B141	ENVOLVENTE MIN	0	-83.85	-190.18	-8.67	-23.422	-8.378	-217.521
N+2.00	B141	ENVOLVENTE MIN	0.025	-83.85	-190.03	-8.67	-23.422	-8.49	-212.768
N+2.00	B141	ENVOLVENTE MIN	0.05	-83.85	-189.89	-8.67	-23.422	-8.607	-208.019
N+2.00	B141	ENVOLVENTE MIN	0.075	-83.85	-189.75	-8.67	-23.422	-8.729	-203.274
N+2.00	B141	ENVOLVENTE MIN	0.1	-83.85	-189.6	-8.67	-23.422	-8.855	-198.532
N+2.00	B141	ENVOLVENTE MIN	0.125	-83.85	-189.46	-8.67	-23.422	-8.985	-193.794
N+2.00	B141	ENVOLVENTE MIN	0.15	-83.85	-189.31	-8.67	-23.422	-9.119	-189.059
N+2.00	B141	ENVOLVENTE MIN	0.175	-83.85	-189.17	-8.67	-23.422	-9.255	-184.328
N+2.00	B141	ENVOLVENTE MIN	0.2	-83.85	-189.03	-8.67	-23.422	-9.395	-179.601
N+2.00	B141	ENVOLVENTE MIN	0.225	-83.85	-188.88	-8.67	-23.422	-9.538	-174.877
N+2.00	B141	ENVOLVENTE MIN	0.25	-83.85	-188.74	-8.67	-23.422	-9.684	-170.157
BASE	B142	ENVOLVENTE MAX	0	0.2	-19.09	63.98	-32.394	13.428	-5.503
BASE	B142	ENVOLVENTE MAX	0.025	0.2	-18.98	63.98	-32.394	11.829	-5.019
BASE	B142	ENVOLVENTE MAX	0.05	0.2	-18.87	63.98	-32.394	10.23	-4.536
BASE	B142	ENVOLVENTE MAX	0.075	0.2	-18.77	63.98	-32.394	8.631	-4.055
BASE	B142	ENVOLVENTE MAX	0.1	0.2	-18.66	63.98	-32.394	7.032	-3.574
BASE	B142	ENVOLVENTE MAX	0.125	0.2	-18.55	63.98	-32.394	5.434	-3.032
BASE	B142	ENVOLVENTE MAX	0.15	0.2	-18.44	63.98	-32.394	3.838	-2.469
BASE	B142	ENVOLVENTE MAX	0.175	0.2	-18.33	63.98	-32.394	2.245	-1.901
BASE	B142	ENVOLVENTE MAX	0.2	0.2	-18.23	63.98	-32.394	0.687	-1.32
BASE	B142	ENVOLVENTE MAX	0.225	0.2	-18.12	63.98	-32.394	0.801	-0.695
BASE	B142	ENVOLVENTE MAX	0.25	0.2	-18.01	63.98	-32.394	2.03	0.426
BASE	B142	ENVOLVENTE MIN	0	-0.17	-64.99	-50.13	-128.54	-10.52	-15.827
BASE	B142	ENVOLVENTE MIN	0.025	-0.17	-64.84	-50.13	-128.54	-9.267	-14.205
BASE	B142	ENVOLVENTE MIN	0.05	-0.17	-64.7	-50.13	-128.54	-8.014	-12.585
BASE	B142	ENVOLVENTE MIN	0.075	-0.17	-64.56	-50.13	-128.54	-6.762	-10.97
BASE	B142	ENVOLVENTE MIN	0.1	-0.17	-64.41	-50.13	-128.54	-5.51	-9.358
BASE	B142	ENVOLVENTE MIN	0.125	-0.17	-64.27	-50.13	-128.54	-4.258	-7.749
BASE	B142	ENVOLVENTE MIN	0.15	-0.17	-64.12	-50.13	-128.54	-3.008	-6.144
BASE	B142	ENVOLVENTE MIN	0.175	-0.17	-63.98	-50.13	-128.54	-1.762	-4.593

7.6.2 FUERZA EN COLUMNAS

Story	Column	Load	Loc	P	V2	V3	T	M2	M3
N+4.00	C8	ENVOLVENTE MAX	0	-98.11	207.35	36.59	54.673	23.126	63.003
N+4.00	C8	ENVOLVENTE MAX	0.067	-97.75	207.35	36.59	54.673	23.941	49.493
N+4.00	C8	ENVOLVENTE MAX	0.134	-97.39	207.35	36.59	54.673	24.769	36.112
N+4.00	C8	ENVOLVENTE MAX	0.201	-97.03	207.35	36.59	54.673	25.608	22.953
N+4.00	C8	ENVOLVENTE MAX	0.268	-96.67	207.35	36.59	54.673	26.459	10.213
N+4.00	C8	ENVOLVENTE MAX	0.335	-96.31	207.35	36.59	54.673	27.32	-1.606
N+4.00	C8	ENVOLVENTE MAX	0.402	-95.94	207.35	36.59	54.673	28.191	-11
N+4.00	C8	ENVOLVENTE MAX	0.469	-95.58	207.35	36.59	54.673	29.071	-14.068
N+4.00	C8	ENVOLVENTE MAX	0.536	-95.22	207.35	36.59	54.673	30.248	-8.406
N+4.00	C8	ENVOLVENTE MAX	0.603	-94.86	207.35	36.59	54.673	32.102	1.998
N+4.00	C8	ENVOLVENTE MAX	0.67	-94.5	207.35	36.59	54.673	33.959	14.122
N+4.00	C8	ENVOLVENTE MIN	0	-315.5	-207.87	-28.61	-48.879	-45.612	-191.548
N+4.00	C8	ENVOLVENTE MIN	0.067	-315.02	-207.87	-28.61	-48.879	-46.962	-178.003
N+4.00	C8	ENVOLVENTE MIN	0.134	-314.54	-207.87	-28.61	-48.879	-48.324	-164.588
N+4.00	C8	ENVOLVENTE MIN	0.201	-314.05	-207.87	-28.61	-48.879	-49.699	-151.394
N+4.00	C8	ENVOLVENTE MIN	0.268	-313.57	-207.87	-28.61	-48.879	-51.084	-138.619
N+4.00	C8	ENVOLVENTE MIN	0.335	-313.09	-207.87	-28.61	-48.879	-52.48	-126.766
N+4.00	C8	ENVOLVENTE MIN	0.402	-312.61	-207.87	-28.61	-48.879	-53.886	-117.337
N+4.00	C8	ENVOLVENTE MIN	0.469	-312.12	-207.87	-28.61	-48.879	-55.301	-115.738
N+4.00	C8	ENVOLVENTE MIN	0.536	-311.64	-207.87	-28.61	-48.879	-57.013	-119.862
N+4.00	C8	ENVOLVENTE MIN	0.603	-311.16	-207.87	-28.61	-48.879	-59.401	-130.231
N+4.00	C8	ENVOLVENTE MIN	0.67	-310.68	-207.87	-28.61	-48.879	-61.793	-142.321
N+3.33	C8	ENVOLVENTE MAX	0	-101.73	214.07	41.58	54.673	19.046	204.887
N+3.33	C8	ENVOLVENTE MAX	0.067	-101.37	214.07	41.58	54.673	18.47	190.623
N+3.33	C8	ENVOLVENTE MAX	0.134	-101.01	214.07	41.58	54.673	17.984	176.368
N+3.33	C8	ENVOLVENTE MAX	0.201	-100.65	214.07	41.58	54.673	17.791	162.123
N+3.33	C8	ENVOLVENTE MAX	0.268	-100.29	214.07	41.58	54.673	18.2	147.89
N+3.33	C8	ENVOLVENTE MAX	0.335	-99.92	214.07	41.58	54.673	18.898	133.671
N+3.33	C8	ENVOLVENTE MAX	0.402	-99.56	214.07	41.58	54.673	19.68	119.471
N+3.33	C8	ENVOLVENTE MAX	0.469	-99.2	214.07	41.58	54.673	20.503	105.295
N+3.33	C8	ENVOLVENTE MAX	0.536	-98.84	214.07	41.58	54.673	21.355	91.15
N+3.33	C8	ENVOLVENTE MAX	0.603	-98.48	214.07	41.58	54.673	22.23	77.047
N+3.33	C8	ENVOLVENTE MAX	0.67	-98.11	214.07	41.58	54.673	23.126	63.003
N+3.33	C8	ENVOLVENTE MIN	0	-320.32	-214.59	-33.6	-48.879	-36.185	-333.778
N+3.33	C8	ENVOLVENTE MIN	0.067	-319.84	-214.59	-33.6	-48.879	-36.144	-319.479
N+3.33	C8	ENVOLVENTE MIN	0.134	-319.36	-214.59	-33.6	-48.879	-36.192	-305.19
N+3.33	C8	ENVOLVENTE MIN	0.201	-318.88	-214.59	-33.6	-48.879	-36.534	-290.91
N+3.33	C8	ENVOLVENTE MIN	0.268	-318.4	-214.59	-33.6	-48.879	-37.478	-276.642
N+3.33	C8	ENVOLVENTE MIN	0.335	-317.91	-214.59	-33.6	-48.879	-38.71	-262.389
N+3.33	C8	ENVOLVENTE MIN	0.402	-317.43	-214.59	-33.6	-48.879	-40.027	-248.155
N+3.33	C8	ENVOLVENTE MIN	0.469	-316.95	-214.59	-33.6	-48.879	-41.385	-233.944
N+3.33	C8	ENVOLVENTE MIN	0.536	-316.47	-214.59	-33.6	-48.879	-42.771	-219.764
N+3.33	C8	ENVOLVENTE MIN	0.603	-315.98	-214.59	-33.6	-48.879	-44.181	-205.627
N+3.33	C8	ENVOLVENTE MIN	0.67	-315.5	-214.59	-33.6	-48.879	-45.612	-191.548
N+2.66	C8	ENVOLVENTE MAX	0	-105.3	218.73	45.21	54.673	33.365	348.742
N+2.66	C8	ENVOLVENTE MAX	0.066	-104.94	218.73	45.21	54.673	30.748	334.341
N+2.66	C8	ENVOLVENTE MAX	0.132	-104.58	218.73	45.21	54.673	28.142	319.943
N+2.66	C8	ENVOLVENTE MAX	0.198	-104.23	218.73	45.21	54.673	25.548	305.548
N+2.66	C8	ENVOLVENTE MAX	0.264	-103.87	218.73	45.21	54.673	23.793	291.155
N+2.66	C8	ENVOLVENTE MAX	0.33	-103.51	218.73	45.21	54.673	22.912	276.766
N+2.66	C8	ENVOLVENTE MAX	0.396	-103.16	218.73	45.21	54.673	22.066	262.38
N+2.66	C8	ENVOLVENTE MAX	0.462	-102.8	218.73	45.21	54.673	21.255	247.999
N+2.66	C8	ENVOLVENTE MAX	0.528	-102.45	218.73	45.21	54.673	20.48	233.622
N+2.66	C8	ENVOLVENTE MAX	0.594	-102.09	218.73	45.21	54.673	19.742	219.251
N+2.66	C8	ENVOLVENTE MAX	0.66	-101.73	218.73	45.21	54.673	19.046	204.887
N+2.66	C8	ENVOLVENTE MIN	0	-325.08	-219.25	-37.23	-48.879	-45.236	-477.974
N+2.66	C8	ENVOLVENTE MIN	0.066	-324.6	-219.25	-37.23	-48.879	-43.146	-463.539
N+2.66	C8	ENVOLVENTE MIN	0.132	-324.13	-219.25	-37.23	-48.879	-41.067	-449.107
N+2.66	C8	ENVOLVENTE MIN	0.198	-323.65	-219.25	-37.23	-48.879	-38.999	-434.678
N+2.66	C8	ENVOLVENTE MIN	0.264	-323.18	-219.25	-37.23	-48.879	-37.771	-420.251
N+2.66	C8	ENVOLVENTE MIN	0.33	-322.7	-219.25	-37.23	-48.879	-37.417	-405.828
N+2.66	C8	ENVOLVENTE MIN	0.396	-322.23	-219.25	-37.23	-48.879	-37.097	-391.408
N+2.66	C8	ENVOLVENTE MIN	0.462	-321.75	-219.25	-37.23	-48.879	-36.813	-376.993
N+2.66	C8	ENVOLVENTE MIN	0.528	-321.28	-219.25	-37.23	-48.879	-36.565	-362.582
N+2.66	C8	ENVOLVENTE MIN	0.594	-320.8	-219.25	-37.23	-48.879	-36.354	-348.177
N+2.66	C8	ENVOLVENTE MIN	0.66	-320.32	-219.25	-37.23	-48.879	-36.185	-333.778
N+2.00	C8	ENVOLVENTE MAX	0	-108.91	221.59	47.54	54.673	62.014	496.936

N+2.00	C8	ENVOLVENTE MIN	0.067	-329.42	-222.11	-39.56	-48.879	-66.164	-611.654
N+2.00	C8	ENVOLVENTE MIN	0.134	-328.94	-222.11	-39.56	-48.879	-63.8	-596.795
N+2.00	C8	ENVOLVENTE MIN	0.201	-328.45	-222.11	-39.56	-48.879	-61.445	-581.937
N+2.00	C8	ENVOLVENTE MIN	0.268	-327.97	-222.11	-39.56	-48.879	-59.098	-567.081
N+2.00	C8	ENVOLVENTE MIN	0.335	-327.49	-222.11	-39.56	-48.879	-56.761	-552.225
N+2.00	C8	ENVOLVENTE MIN	0.402	-327.01	-222.11	-39.56	-48.879	-54.435	-537.371
N+2.00	C8	ENVOLVENTE MIN	0.469	-326.52	-222.11	-39.56	-48.879	-52.118	-522.519
N+2.00	C8	ENVOLVENTE MIN	0.536	-326.04	-222.11	-39.56	-48.879	-49.812	-507.669
N+2.00	C8	ENVOLVENTE MIN	0.603	-325.56	-222.11	-39.56	-48.879	-47.518	-492.82
N+2.00	C8	ENVOLVENTE MIN	0.67	-325.08	-222.11	-39.56	-48.879	-45.236	-477.974
N+1.33	C8	ENVOLVENTE MAX	0	-112.53	222.97	48.71	54.673	92.219	646.159
N+1.33	C8	ENVOLVENTE MAX	0.067	-112.17	222.97	48.71	54.673	89.174	631.234
N+1.33	C8	ENVOLVENTE MAX	0.134	-111.81	222.97	48.71	54.673	86.133	616.309
N+1.33	C8	ENVOLVENTE MAX	0.201	-111.45	222.97	48.71	54.673	83.098	601.385
N+1.33	C8	ENVOLVENTE MAX	0.268	-111.09	222.97	48.71	54.673	80.067	586.461
N+1.33	C8	ENVOLVENTE MAX	0.335	-110.72	222.97	48.71	54.673	77.042	571.538
N+1.33	C8	ENVOLVENTE MAX	0.402	-110.36	222.97	48.71	54.673	74.023	556.616
N+1.33	C8	ENVOLVENTE MAX	0.469	-110	222.97	48.71	54.673	71.01	541.695
N+1.33	C8	ENVOLVENTE MAX	0.536	-109.64	222.97	48.71	54.673	68.004	526.774
N+1.33	C8	ENVOLVENTE MAX	0.603	-109.28	222.97	48.71	54.673	65.005	511.855
N+1.33	C8	ENVOLVENTE MAX	0.67	-108.91	222.97	48.71	54.673	62.014	496.936
N+1.33	C8	ENVOLVENTE MIN	0	-334.72	-223.49	-40.72	-48.879	-93.395	-776.084
N+1.33	C8	ENVOLVENTE MIN	0.067	-334.24	-223.49	-40.72	-48.879	-90.884	-761.124
N+1.33	C8	ENVOLVENTE MIN	0.134	-333.76	-223.49	-40.72	-48.879	-88.378	-746.164
N+1.33	C8	ENVOLVENTE MIN	0.201	-333.28	-223.49	-40.72	-48.879	-85.877	-731.205
N+1.33	C8	ENVOLVENTE MIN	0.268	-332.8	-223.49	-40.72	-48.879	-83.382	-716.247
N+1.33	C8	ENVOLVENTE MIN	0.335	-332.31	-223.49	-40.72	-48.879	-80.891	-701.29
N+1.33	C8	ENVOLVENTE MIN	0.402	-331.83	-223.49	-40.72	-48.879	-78.407	-686.333
N+1.33	C8	ENVOLVENTE MIN	0.469	-331.35	-223.49	-40.72	-48.879	-75.929	-671.377
N+1.33	C8	ENVOLVENTE MIN	0.536	-330.87	-223.49	-40.72	-48.879	-73.458	-656.422
N+1.33	C8	ENVOLVENTE MIN	0.603	-330.38	-223.49	-40.72	-48.879	-70.993	-641.468
N+1.33	C8	ENVOLVENTE MIN	0.67	-329.9	-223.49	-40.72	-48.879	-68.537	-626.515
N+0.66	C8	ENVOLVENTE MAX	0	-116.1	223.34	49.03	54.673	122.725	793.453
N+0.66	C8	ENVOLVENTE MAX	0.066	-115.74	223.34	49.03	54.673	119.567	778.721
N+0.66	C8	ENVOLVENTE MAX	0.132	-115.38	223.34	49.03	54.673	116.517	763.991
N+0.66	C8	ENVOLVENTE MAX	0.198	-115.03	223.34	49.03	54.673	113.469	749.26
N+0.66	C8	ENVOLVENTE MAX	0.264	-114.67	223.34	49.03	54.673	110.423	734.53
N+0.66	C8	ENVOLVENTE MAX	0.33	-114.31	223.34	49.03	54.673	107.381	719.801
N+0.66	C8	ENVOLVENTE MAX	0.396	-113.96	223.34	49.03	54.673	104.342	705.071
N+0.66	C8	ENVOLVENTE MAX	0.462	-113.6	223.34	49.03	54.673	101.306	690.343
N+0.66	C8	ENVOLVENTE MAX	0.528	-113.25	223.34	49.03	54.673	98.273	675.614
N+0.66	C8	ENVOLVENTE MAX	0.594	-112.89	223.34	49.03	54.673	95.244	660.886
N+0.66	C8	ENVOLVENTE MAX	0.66	-112.53	223.34	49.03	54.673	92.219	646.159
N+0.66	C8	ENVOLVENTE MIN	0	-339.48	-223.86	-41.05	-48.879	-118.633	-923.718
N+0.66	C8	ENVOLVENTE MIN	0.066	-339	-223.86	-41.05	-48.879	-116.002	-908.953
N+0.66	C8	ENVOLVENTE MIN	0.132	-338.53	-223.86	-41.05	-48.879	-113.478	-894.188
N+0.66	C8	ENVOLVENTE MIN	0.198	-338.05	-223.86	-41.05	-48.879	-110.957	-879.424
N+0.66	C8	ENVOLVENTE MIN	0.264	-337.58	-223.86	-41.05	-48.879	-108.438	-864.66
N+0.66	C8	ENVOLVENTE MIN	0.33	-337.1	-223.86	-41.05	-48.879	-105.923	-849.896
N+0.66	C8	ENVOLVENTE MIN	0.396	-336.63	-223.86	-41.05	-48.879	-103.41	-835.133
N+0.66	C8	ENVOLVENTE MIN	0.594	-335.2	-223.86	-41.05	-48.879	-95.893	-790.845
N+0.66	C8	ENVOLVENTE MIN	0.66	-334.72	-223.86	-41.05	-48.879	-93.395	-776.084
N+3.33	C10	ENVOLVENTE MAX	0	-83.54	145.17	50.34	51.493	36.044	-39.409
N+3.33	C10	ENVOLVENTE MAX	0.067	-83.17	145.17	50.34	51.493	40.435	-47.326
N+3.33	C10	ENVOLVENTE MAX	0.134	-82.81	145.17	50.34	51.493	44.843	-54.733
N+3.33	C10	ENVOLVENTE MAX	0.201	-82.45	145.17	50.34	51.493	49.263	-61.437
N+3.33	C10	ENVOLVENTE MAX	0.268	-82.09	145.17	50.34	51.493	53.695	-67.159
N+3.33	C10	ENVOLVENTE MAX	0.335	-81.73	145.17	50.34	51.493	58.135	-71.507
N+3.33	C10	ENVOLVENTE MAX	0.402	-81.37	145.17	50.34	51.493	62.584	-74.018
N+3.33	C10	ENVOLVENTE MAX	0.469	-81	145.17	50.34	51.493	67.04	-74.313
N+3.33	C10	ENVOLVENTE MAX	0.536	-80.64	145.17	50.34	51.493	71.501	-72.317
N+3.33	C10	ENVOLVENTE MAX	0.603	-80.28	145.17	50.34	51.493	75.968	-68.317
N+3.33	C10	ENVOLVENTE MAX	0.67	-79.92	145.17	50.34	51.493	80.439	-62.779
N+3.33	C10	ENVOLVENTE MIN	0	-269.4	-143.45	-67.45	-37.97	-23.634	-330.803
N+3.33	C10	ENVOLVENTE MIN	0.067	-268.92	-143.45	-67.45	-37.97	-26.879	-323.001
N+3.33	C10	ENVOLVENTE MIN	0.134	-268.44	-143.45	-67.45	-37.97	-30.14	-318.922
N+3.33	C10	ENVOLVENTE MIN	0.201	-267.95	-143.45	-67.45	-37.97	-33.414	-319.018

N+2.66	C10	ENVOLVENTE MAX	0.33	-85.32	151.87	53.85	51.493	20.493	5.606
N+2.66	C10	ENVOLVENTE MAX	0.396	-84.96	151.87	53.85	51.493	22.863	-3.745
N+2.66	C10	ENVOLVENTE MAX	0.462	-84.61	151.87	53.85	51.493	25.36	-12.97
N+2.66	C10	ENVOLVENTE MAX	0.528	-84.25	151.87	53.85	51.493	27.948	-22.029
N+2.66	C10	ENVOLVENTE MAX	0.594	-83.89	151.87	53.85	51.493	31.512	-30.867
N+2.66	C10	ENVOLVENTE MAX	0.66	-83.54	151.87	53.85	51.493	36.044	-39.409
N+2.66	C10	ENVOLVENTE MIN	0	-274.15	-150.16	-70.96	-37.97	-16.678	-422.568
N+2.66	C10	ENVOLVENTE MIN	0.066	-273.68	-150.16	-70.96	-37.97	-15.285	-413.002
N+2.66	C10	ENVOLVENTE MIN	0.132	-273.2	-150.16	-70.96	-37.97	-14.048	-403.476
N+2.66	C10	ENVOLVENTE MIN	0.198	-272.73	-150.16	-70.96	-37.97	-13.029	-394.001
N+2.66	C10	ENVOLVENTE MIN	0.264	-272.25	-150.16	-70.96	-37.97	-12.788	-384.587
N+2.66	C10	ENVOLVENTE MIN	0.33	-271.78	-150.16	-70.96	-37.97	-13.728	-375.251
N+2.66	C10	ENVOLVENTE MIN	0.396	-271.3	-150.16	-70.96	-37.97	-14.97	-366.013
N+2.66	C10	ENVOLVENTE MIN	0.462	-270.83	-150.16	-70.96	-37.97	-16.337	-356.902
N+2.66	C10	ENVOLVENTE MIN	0.528	-270.35	-150.16	-70.96	-37.97	-17.796	-347.956
N+2.66	C10	ENVOLVENTE MIN	0.594	-269.88	-150.16	-70.96	-37.97	-20.231	-339.231
N+2.66	C10	ENVOLVENTE MIN	0.66	-269.4	-150.16	-70.96	-37.97	-23.634	-330.803
N+2.00	C10	ENVOLVENTE MAX	0	-90.72	156.06	56.2	51.493	52.889	155.785
N+2.00	C10	ENVOLVENTE MAX	0.067	-90.36	156.06	56.2	51.493	49.24	145.488
N+2.00	C10	ENVOLVENTE MAX	0.134	-89.99	156.06	56.2	51.493	45.608	135.202
N+2.00	C10	ENVOLVENTE MAX	0.201	-89.63	156.06	56.2	51.493	41.995	124.926
N+2.00	C10	ENVOLVENTE MAX	0.268	-89.27	156.06	56.2	51.493	38.404	114.663
N+2.00	C10	ENVOLVENTE MAX	0.335	-88.91	156.06	56.2	51.493	34.839	104.415
N+2.00	C10	ENVOLVENTE MAX	0.402	-88.55	156.06	56.2	51.493	31.306	94.184
N+2.00	C10	ENVOLVENTE MAX	0.469	-88.19	156.06	56.2	51.493	27.809	83.972
N+2.00	C10	ENVOLVENTE MAX	0.536	-87.82	156.06	56.2	51.493	24.353	73.783
N+2.00	C10	ENVOLVENTE MAX	0.603	-87.46	156.06	56.2	51.493	20.946	63.62
N+2.00	C10	ENVOLVENTE MAX	0.67	-87.1	156.06	56.2	51.493	17.796	53.489
N+2.00	C10	ENVOLVENTE MIN	0	-278.98	-154.35	-73.31	-37.97	-63.233	-523.715
N+2.00	C10	ENVOLVENTE MIN	0.067	-278.5	-154.35	-73.31	-37.97	-58.439	-513.534
N+2.00	C10	ENVOLVENTE MIN	0.134	-278.01	-154.35	-73.31	-37.97	-53.66	-503.362
N+2.00	C10	ENVOLVENTE MIN	0.201	-277.53	-154.35	-73.31	-37.97	-48.9	-493.201
N+2.00	C10	ENVOLVENTE MIN	0.268	-277.05	-154.35	-73.31	-37.97	-44.163	-483.053
N+2.00	C10	ENVOLVENTE MIN	0.335	-276.57	-154.35	-73.31	-37.97	-39.453	-472.92
N+2.00	C10	ENVOLVENTE MIN	0.402	-276.08	-154.35	-73.31	-37.97	-34.773	-462.804
N+2.00	C10	ENVOLVENTE MIN	0.469	-275.6	-154.35	-73.31	-37.97	-30.129	-452.707
N+2.00	C10	ENVOLVENTE MIN	0.536	-275.12	-154.35	-73.31	-37.97	-25.527	-442.632
N+2.00	C10	ENVOLVENTE MIN	0.603	-274.64	-154.35	-73.31	-37.97	-20.974	-432.584
N+2.00	C10	ENVOLVENTE MIN	0.67	-274.15	-154.35	-73.31	-37.97	-16.678	-422.568
N+1.33	C10	ENVOLVENTE MAX	0	-94.34	158.13	57.43	51.493	90.69	260.473
N+1.33	C10	ENVOLVENTE MAX	0.067	-93.97	158.13	57.43	51.493	86.884	249.982
N+1.33	C10	ENVOLVENTE MAX	0.134	-93.61	158.13	57.43	51.493	83.081	239.495
N+1.33	C10	ENVOLVENTE MAX	0.201	-93.25	158.13	57.43	51.493	79.283	229.012
N+1.33	C10	ENVOLVENTE MAX	0.268	-92.89	158.13	57.43	51.493	75.49	218.534
N+1.33	C10	ENVOLVENTE MAX	0.335	-92.53	158.13	57.43	51.493	71.703	208.06
N+1.33	C10	ENVOLVENTE MAX	0.402	-92.17	158.13	57.43	51.493	67.922	197.592
N+1.33	C10	ENVOLVENTE MAX	0.469	-91.8	158.13	57.43	51.493	64.149	187.129
N+1.33	C10	ENVOLVENTE MAX	0.536	-91.44	158.13	57.43	51.493	60.384	176.674
N+1.33	C10	ENVOLVENTE MAX	0.603	-91.08	158.13	57.43	51.493	56.63	166.225
N+1.33	C10	ENVOLVENTE MAX	0.67	-90.72	158.13	57.43	51.493	52.889	155.785
N+1.33	C10	ENVOLVENTE MIN	0	-283.8	-156.41	-74.53	-37.97	-112.498	-627.254
N+1.33	C10	ENVOLVENTE MIN	0.067	-283.32	-156.41	-74.53	-37.97	-107.545	-616.878
N+1.33	C10	ENVOLVENTE MIN	0.134	-282.84	-156.41	-74.53	-37.97	-102.597	-606.506
N+1.33	C10	ENVOLVENTE MIN	0.201	-282.35	-156.41	-74.53	-37.97	-97.652	-596.138
N+1.33	C10	ENVOLVENTE MIN	0.268	-281.87	-156.41	-74.53	-37.97	-92.713	-585.774
N+1.33	C10	ENVOLVENTE MIN	0.335	-281.39	-156.41	-74.53	-37.97	-87.779	-575.416
N+1.33	C10	ENVOLVENTE MIN	0.402	-280.91	-156.41	-74.53	-37.97	-82.852	-565.062
N+1.33	C10	ENVOLVENTE MIN	0.469	-280.42	-156.41	-74.53	-37.97	-77.932	-554.715
N+1.33	C10	ENVOLVENTE MIN	0.536	-279.94	-156.41	-74.53	-37.97	-73.022	-544.374
N+1.33	C10	ENVOLVENTE MIN	0.603	-279.46	-156.41	-74.53	-37.97	-68.121	-534.041
N+1.33	C10	ENVOLVENTE MIN	0.67	-278.98	-156.41	-74.53	-37.97	-63.233	-523.715
N+0.66	C10	ENVOLVENTE MAX	0	-201.16	167.38	112.2	52.663	131.572	489.379
N+0.66	C10	ENVOLVENTE MAX	0.066	-200.81	167.38	112.2	52.663	124.503	478.403
N+0.66	C10	ENVOLVENTE MAX	0.132	-200.45	167.38	112.2	52.663	117.474	467.43
N+0.66	C10	ENVOLVENTE MAX	0.198	-200.09	167.38	112.2	52.663	110.494	456.461
N+0.66	C10	ENVOLVENTE MAX	0.264	-199.74	167.38	112.2	52.663	103.572	445.496
N+0.66	C10	ENVOLVENTE MAX	0.33	-199.38	167.38	112.2	52.663	96.72	434.536

N+0.66	C10	ENVOLVENTE MIN	0.462	-561.05	-165.69	-127.44	-30.821	-92.575	-381.088
N+0.66	C10	ENVOLVENTE MIN	0.528	-560.58	-165.69	-127.44	-30.821	-85.041	-370.255
N+0.66	C10	ENVOLVENTE MIN	0.594	-560.1	-165.69	-127.44	-30.821	-77.675	-359.427
N+0.66	C10	ENVOLVENTE MIN	0.66	-559.63	-165.69	-127.44	-30.821	-70.525	-348.606
N+2.66	C12	ENVOLVENTE MAX	0	-86.8	171.39	93.08	46.926	6.495	-31.892
N+2.66	C12	ENVOLVENTE MAX	0.066	-86.44	171.39	93.08	46.926	6.931	-42.794
N+2.66	C12	ENVOLVENTE MAX	0.132	-86.08	171.39	93.08	46.926	10.596	-53.541
N+2.66	C12	ENVOLVENTE MAX	0.198	-85.73	171.39	93.08	46.926	14.802	-64.026
N+2.66	C12	ENVOLVENTE MAX	0.264	-85.37	171.39	93.08	46.926	19.266	-74.022
N+2.66	C12	ENVOLVENTE MAX	0.33	-85.02	171.39	93.08	46.926	23.884	-83.085
N+2.66	C12	ENVOLVENTE MAX	0.396	-84.66	171.39	93.08	46.926	28.602	-90.559
N+2.66	C12	ENVOLVENTE MAX	0.462	-84.3	171.39	93.08	46.926	33.39	-95.36
N+2.66	C12	ENVOLVENTE MAX	0.528	-83.95	171.39	93.08	46.926	38.229	-95.591
N+2.66	C12	ENVOLVENTE MAX	0.594	-83.59	171.39	93.08	46.926	43.105	-90.702
N+2.66	C12	ENVOLVENTE MAX	0.66	-83.23	171.39	93.08	46.926	48.009	-82.635
N+2.66	C12	ENVOLVENTE MIN	0	-272.19	-172.18	-76.38	-38.842	-26.12	-352.888
N+2.66	C12	ENVOLVENTE MIN	0.066	-271.72	-172.18	-76.38	-38.842	-27.659	-341.934
N+2.66	C12	ENVOLVENTE MIN	0.132	-271.24	-172.18	-76.38	-38.842	-32.426	-331.134
N+2.66	C12	ENVOLVENTE MIN	0.198	-270.77	-172.18	-76.38	-38.842	-37.734	-330.327
N+2.66	C12	ENVOLVENTE MIN	0.264	-270.29	-172.18	-76.38	-38.842	-43.301	-330.282
N+2.66	C12	ENVOLVENTE MIN	0.33	-269.82	-172.18	-76.38	-38.842	-49.021	-330.236
N+2.66	C12	ENVOLVENTE MIN	0.396	-269.34	-172.18	-76.38	-38.842	-54.842	-330.191
N+2.66	C12	ENVOLVENTE MIN	0.462	-268.87	-172.18	-76.38	-38.842	-60.733	-330.145
N+2.66	C12	ENVOLVENTE MIN	0.528	-268.39	-172.18	-76.38	-38.842	-66.674	-330.1
N+2.66	C12	ENVOLVENTE MIN	0.594	-267.92	-172.18	-76.38	-38.842	-72.652	-330.054
N+2.66	C12	ENVOLVENTE MIN	0.66	-267.44	-172.18	-76.38	-38.842	-78.659	-330.009
N+2.00	C12	ENVOLVENTE MAX	0	-90.42	178.44	95.32	46.926	52.586	86.072
N+2.00	C12	ENVOLVENTE MAX	0.067	-90.05	178.44	95.32	46.926	46.732	74.186
N+2.00	C12	ENVOLVENTE MAX	0.134	-89.69	178.44	95.32	46.926	40.904	62.31
N+2.00	C12	ENVOLVENTE MAX	0.201	-89.33	178.44	95.32	46.926	35.115	50.445
N+2.00	C12	ENVOLVENTE MAX	0.268	-88.97	178.44	95.32	46.926	29.379	38.593
N+2.00	C12	ENVOLVENTE MAX	0.335	-88.61	178.44	95.32	46.926	23.723	26.759
N+2.00	C12	ENVOLVENTE MAX	0.402	-88.24	178.44	95.32	46.926	18.197	14.947
N+2.00	C12	ENVOLVENTE MAX	0.469	-87.88	178.44	95.32	46.926	12.909	3.163
N+2.00	C12	ENVOLVENTE MAX	0.536	-87.52	178.44	95.32	46.926	9.016	-8.582
N+2.00	C12	ENVOLVENTE MAX	0.603	-87.16	178.44	95.32	46.926	7.165	-20.274
N+2.00	C12	ENVOLVENTE MAX	0.67	-86.8	178.44	95.32	46.926	6.495	-31.892
N+2.00	C12	ENVOLVENTE MIN	0	-277.02	-179.23	-78.62	-38.842	-61.02	-471.383
N+2.00	C12	ENVOLVENTE MIN	0.067	-276.53	-179.23	-78.62	-38.842	-56.284	-459.444
N+2.00	C12	ENVOLVENTE MIN	0.134	-276.05	-179.23	-78.62	-38.842	-51.576	-447.514
N+2.00	C12	ENVOLVENTE MIN	0.201	-275.57	-179.23	-78.62	-38.842	-46.906	-435.596
N+2.00	C12	ENVOLVENTE MIN	0.268	-275.09	-179.23	-78.62	-38.842	-42.289	-423.691
N+2.00	C12	ENVOLVENTE MIN	0.335	-274.6	-179.23	-78.62	-38.842	-37.752	-411.804
N+2.00	C12	ENVOLVENTE MIN	0.402	-274.12	-179.23	-78.62	-38.842	-33.345	-399.939
N+2.00	C12	ENVOLVENTE MIN	0.469	-273.64	-179.23	-78.62	-38.842	-29.177	-388.102
N+2.00	C12	ENVOLVENTE MIN	0.536	-273.16	-179.23	-78.62	-38.842	-26.403	-376.304
N+2.00	C12	ENVOLVENTE MIN	0.603	-272.67	-179.23	-78.62	-38.842	-25.671	-364.558
N+2.00	C12	ENVOLVENTE MIN	0.67	-272.19	-179.23	-78.62	-38.842	-26.12	-352.888
N+1.33	C12	ENVOLVENTE MAX	0	-189.58	240.02	126.3	51.972	70.179	338.173
N+1.33	C12	ENVOLVENTE MAX	0.067	-189.22	240.02	126.3	51.972	62.413	322.388
N+1.33	C12	ENVOLVENTE MAX	0.134	-188.86	240.02	126.3	51.972	54.772	306.633
N+1.33	C12	ENVOLVENTE MAX	0.201	-188.49	240.02	126.3	51.972	47.31	290.914
N+1.33	C12	ENVOLVENTE MAX	0.268	-188.13	240.02	126.3	51.972	40.113	275.236
N+1.33	C12	ENVOLVENTE MAX	0.335	-187.77	240.02	126.3	51.972	33.321	259.631
N+1.33	C12	ENVOLVENTE MAX	0.402	-187.41	240.02	126.3	51.972	27.151	244.084
N+1.33	C12	ENVOLVENTE MAX	0.469	-187.05	240.02	126.3	51.972	21.937	228.608
N+1.33	C12	ENVOLVENTE MAX	0.536	-186.68	240.02	126.3	51.972	18.177	213.219
N+1.33	C12	ENVOLVENTE MAX	0.603	-186.32	240.02	126.3	51.972	16.514	197.938
N+1.33	C12	ENVOLVENTE MAX	0.67	-185.96	240.02	126.3	51.972	17.398	182.791
N+1.33	C12	ENVOLVENTE MIN	0	-548.54	-240.87	-114.23	-40.456	-86.161	-338.435
N+1.33	C12	ENVOLVENTE MIN	0.067	-548.06	-240.87	-114.23	-40.456	-79.204	-322.593
N+1.33	C12	ENVOLVENTE MIN	0.134	-547.57	-240.87	-114.23	-40.456	-72.372	-306.781
N+1.33	C12	ENVOLVENTE MIN	0.201	-547.09	-240.87	-114.23	-40.456	-65.719	-291.005
N+1.33	C12	ENVOLVENTE MIN	0.268	-546.61	-240.87	-114.23	-40.456	-59.331	-275.271
N+1.33	C12	ENVOLVENTE MIN	0.335	-546.13	-240.87	-114.23	-40.456	-53.348	-259.609
N+1.33	C12	ENVOLVENTE MIN	0.402	-545.64	-240.87	-114.23	-40.456	-47.986	-244.005
N+1.33	C12	ENVOLVENTE MIN	0.469	-545.16	-240.87	-114.23	-40.456	-43.582	-228.473
N+1.33	C12	ENVOLVENTE MIN	0.536	-544.68	-240.87	-114.23	-40.456	-40.631	-213.027

N+0.66	C12	ENVOLVENTE MAX	0.594	-189.94	241.37	126.84	51.972	77.948	353.822
N+0.66	C12	ENVOLVENTE MAX	0.66	-189.58	241.37	126.84	51.972	70.179	338.173
N+0.66	C12	ENVOLVENTE MIN	0	-553.29	-242.21	-114.77	-40.456	-157.621	-496.29
N+0.66	C12	ENVOLVENTE MIN	0.066	-552.82	-242.21	-114.77	-40.456	-150.377	-480.445
N+0.66	C12	ENVOLVENTE MIN	0.132	-552.34	-242.21	-114.77	-40.456	-143.145	-464.61
N+0.66	C12	ENVOLVENTE MIN	0.198	-551.87	-242.21	-114.77	-40.456	-135.927	-448.785
N+0.66	C12	ENVOLVENTE MIN	0.264	-551.39	-242.21	-114.77	-40.456	-128.725	-432.972
N+0.66	C12	ENVOLVENTE MIN	0.33	-550.92	-242.21	-114.77	-40.456	-121.543	-417.172
N+0.66	C12	ENVOLVENTE MIN	0.396	-550.44	-242.21	-114.77	-40.456	-114.386	-401.387
N+0.66	C12	ENVOLVENTE MIN	0.462	-549.96	-242.21	-114.77	-40.456	-107.26	-385.619
N+0.66	C12	ENVOLVENTE MIN	0.528	-549.49	-242.21	-114.77	-40.456	-100.172	-369.869
N+0.66	C12	ENVOLVENTE MIN	0.594	-549.01	-242.21	-114.77	-40.456	-93.134	-354.14
N+0.66	C12	ENVOLVENTE MIN	0.66	-548.54	-242.21	-114.77	-40.456	-86.161	-338.435
N+2.00	C14	ENVOLVENTE MAX	0	-110.37	196.23	132.91	60.657	7.746	115.54
N+2.00	C14	ENVOLVENTE MAX	0.067	-110.01	196.23	132.91	60.657	0.075	103.429
N+2.00	C14	ENVOLVENTE MAX	0.134	-109.65	196.23	132.91	60.657	-6.879	91.531
N+2.00	C14	ENVOLVENTE MAX	0.201	-109.29	196.23	132.91	60.657	-5.244	79.937
N+2.00	C14	ENVOLVENTE MAX	0.268	-108.92	196.23	132.91	60.657	0.981	68.795
N+2.00	C14	ENVOLVENTE MAX	0.335	-108.56	196.23	132.91	60.657	7.616	58.358
N+2.00	C14	ENVOLVENTE MAX	0.402	-108.2	196.23	132.91	60.657	14.33	49.083
N+2.00	C14	ENVOLVENTE MAX	0.469	-107.84	196.23	132.91	60.657	21.071	41.771
N+2.00	C14	ENVOLVENTE MAX	0.536	-107.48	196.23	132.91	60.657	27.824	37.484
N+2.00	C14	ENVOLVENTE MAX	0.603	-107.12	196.23	132.91	60.657	34.584	36.878
N+2.00	C14	ENVOLVENTE MAX	0.67	-106.75	196.23	132.91	60.657	41.348	39.869
N+2.00	C14	ENVOLVENTE MIN	0	-390.87	-196.59	-101.12	-55.224	-44.836	-132.895
N+2.00	C14	ENVOLVENTE MIN	0.067	-390.38	-196.59	-101.12	-55.224	-39.295	-120.76
N+2.00	C14	ENVOLVENTE MIN	0.134	-389.9	-196.59	-101.12	-55.224	-40.884	-108.838
N+2.00	C14	ENVOLVENTE MIN	0.201	-389.42	-196.59	-101.12	-55.224	-43.028	-97.22
N+2.00	C14	ENVOLVENTE MIN	0.268	-388.94	-196.59	-101.12	-55.224	-46.59	-86.054
N+2.00	C14	ENVOLVENTE MIN	0.335	-388.45	-196.59	-101.12	-55.224	-55.355	-75.593
N+2.00	C14	ENVOLVENTE MIN	0.402	-387.97	-196.59	-101.12	-55.224	-64.199	-66.294
N+2.00	C14	ENVOLVENTE MIN	0.469	-387.49	-196.59	-101.12	-55.224	-73.07	-58.958
N+2.00	C14	ENVOLVENTE MIN	0.536	-387.01	-196.59	-101.12	-55.224	-81.953	-54.647
N+2.00	C14	ENVOLVENTE MIN	0.603	-386.52	-196.59	-101.12	-55.224	-90.843	-54.017
N+2.00	C14	ENVOLVENTE MIN	0.67	-386.04	-196.59	-101.12	-55.224	-99.737	-56.984
N+1.33	C14	ENVOLVENTE MAX	0	-113.99	200.09	134.58	60.657	86.977	243.854
N+1.33	C14	ENVOLVENTE MAX	0.067	-113.63	200.09	134.58	60.657	79.041	230.842
N+1.33	C14	ENVOLVENTE MAX	0.134	-113.27	200.09	134.58	60.657	71.105	217.852
N+1.33	C14	ENVOLVENTE MAX	0.201	-112.9	200.09	134.58	60.657	63.17	204.887
N+1.33	C14	ENVOLVENTE MAX	0.268	-112.54	200.09	134.58	60.657	55.237	191.953
N+1.33	C14	ENVOLVENTE MAX	0.335	-112.18	200.09	134.58	60.657	47.305	179.056
N+1.33	C14	ENVOLVENTE MAX	0.402	-111.82	200.09	134.58	60.657	39.375	166.205
N+1.33	C14	ENVOLVENTE MAX	0.469	-111.46	200.09	134.58	60.657	31.45	153.41
N+1.33	C14	ENVOLVENTE MAX	0.536	-111.1	200.09	134.58	60.657	23.531	140.686
N+1.33	C14	ENVOLVENTE MAX	0.603	-110.73	200.09	134.58	60.657	15.625	128.053
N+1.33	C14	ENVOLVENTE MAX	0.67	-110.37	200.09	134.58	60.657	7.746	115.54
N+1.33	C14	ENVOLVENTE MIN	0	-395.69	-200.44	-102.79	-55.224	-102.767	-261.45
N+1.33	C14	ENVOLVENTE MIN	0.067	-395.21	-200.44	-102.79	-55.224	-96.961	-248.414
N+1.33	C14	ENVOLVENTE MIN	0.134	-394.73	-200.44	-102.79	-55.224	-91.155	-235.399
N+1.33	C14	ENVOLVENTE MIN	0.201	-394.24	-200.44	-102.79	-55.224	-85.35	-222.41
N+1.33	C14	ENVOLVENTE MIN	0.268	-393.76	-200.44	-102.79	-55.224	-79.546	-209.452
N+1.33	C14	ENVOLVENTE MIN	0.335	-393.28	-200.44	-102.79	-55.224	-73.745	-196.532
N+1.33	C14	ENVOLVENTE MIN	0.402	-392.8	-200.44	-102.79	-55.224	-67.945	-183.656
N+1.33	C14	ENVOLVENTE MIN	0.469	-392.31	-200.44	-102.79	-55.224	-62.15	-170.837
N+1.33	C14	ENVOLVENTE MIN	0.536	-391.83	-200.44	-102.79	-55.224	-56.361	-158.089
N+1.33	C14	ENVOLVENTE MIN	0.603	-391.35	-200.44	-102.79	-55.224	-50.584	-145.432
N+1.33	C14	ENVOLVENTE MIN	0.67	-390.87	-200.44	-102.79	-55.224	-44.836	-132.895
N+0.66	C14	ENVOLVENTE MAX	0	-117.55	201.23	135.11	60.657	168.77	373.467
N+0.66	C14	ENVOLVENTE MAX	0.066	-117.2	201.23	135.11	60.657	159.854	360.469
N+0.66	C14	ENVOLVENTE MAX	0.132	-116.84	201.23	135.11	60.657	150.938	347.477
N+0.66	C14	ENVOLVENTE MAX	0.198	-116.48	201.23	135.11	60.657	142.022	334.491
N+0.66	C14	ENVOLVENTE MAX	0.264	-116.13	201.23	135.11	60.657	134.102	321.512
N+0.66	C14	ENVOLVENTE MAX	0.33	-115.77	201.23	135.11	60.657	126.248	308.542
N+0.66	C14	ENVOLVENTE MAX	0.396	-115.42	201.23	135.11	60.657	118.393	295.58
N+0.66	C14	ENVOLVENTE MAX	0.462	-115.06	201.23	135.11	60.657	110.539	282.629
N+0.66	C14	ENVOLVENTE MAX	0.528	-114.7	201.23	135.11	60.657	102.684	269.69
N+0.66	C14	ENVOLVENTE MAX	0.594	-114.35	201.23	135.11	60.657	94.83	256.764

8 ESPECIFICACIONES TÉCNICAS

Los materiales utilizados son:

Concreto	21.1 MPa para vigas, placas, zapatas y
columnas. Concreto	14 MPa (para concreto de limpieza).
Aceropara refuerzo	fy = 420 MPa para todos los diámetros.
Acero estructural	A36 pernos de anclaje y platinas
Acero estructural	A500 en perfiles metálicos

9 CONCLUSIONES Y RECOMENDACIONES

Habiendo finalizado el diseño y análisis estructural de la institución educativa del valle – sede Julio Cesar Arce Grupo 002 basado en la Norma Colombiana de Diseño y Construcción Sismo Resistente Ley 400 de 1997 (Modificada Ley 1229 de 2008) y Decreto 926 de Marzo de 2010, Decreto 092 del 17 de Enero de
2011, Decreto 0340 del 13 de Febrero de 2012 y en el Reglamento para Concreto Estructural ACI 318S-08, hemos llegado a las siguientes conclusiones y recomendaciones.

- Se cumplió satisfactoriamente con los objetivos del cálculo y diseño estructural mediante la aplicación de la norma sismo resistente (NSR-10) y el reglamento para concreto estructural ACI 318S-08, además de la ayuda del software ETABS V9.7.4 se puede garantizar el buen funcionamiento de la estructura que presenta una buena respuesta ante un evento sísmico.
- La revisión de los desplazamientos laterales (derivas) de la estructura teniendo en cuenta las direcciones "X" y "y", nos arrojó que los resultados obtenidos son aceptables permitiendo un buen funcionamiento ante la actuación de un sismo y que cumple con lo establecido en la norma sismo resistente (NSR-10).
- En cuanto a la revisión de columnas y vigas determinamos que cumplen con los requisitos, ya que en estructuras de edificios aporticados es obligatorio que los miembros horizontales fallen antes que los verticales, permitiendo de esa manera un retraso del colapso total de la estructura.
- Para la construcción de la estructura se recomienda llevar un estricto control en la calidad de los materiales a utilizar, ya que estos deberán cumplir con requisitos especiales para el buen funcionamiento de la edificación. Además que estos deberán ser supervisados a la hora de la puesta en marcha por el ingeniero residente.

10 BIBLIOGRAFÍA

•Norma Colombiana de Diseño y Construcción Sismo Resistente Ley 400 de 1997 (Modificada Ley 1229 de 2008) y Decreto 926 de Marzo de 2010, Decreto 092 del 17 de Enero de 2011, Decreto 0340 del 13 de Febrero de 2012
•Reglamento para Concreto Estructural ACI 318S-08.