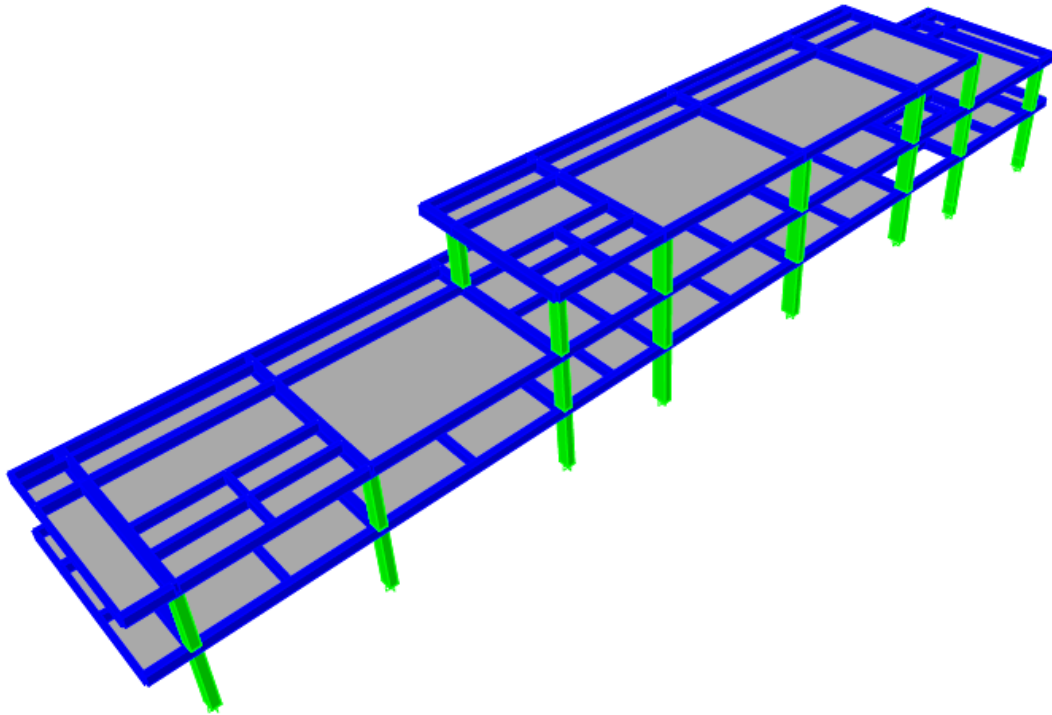


**PROYECTO: I.E. EL SUR
IPIALES (NARIÑO)**
dye16-2257



**MEMORIAS DE ANÁLISIS
Y DISEÑO ESTRUCTURAL**

BOGOTÁ D.C. 18 DE NOVIEMBRE DE 2016

1. DESCRIPCIÓN DEL PROYECTO

1.1. INTRODUCCIÓN

El presente documento contiene las memorias de análisis y diseño estructural correspondiente al proyecto ***I.E. EL SUR*** ubicado en ***IPIALES (NARIÑO)***

1.2. DESCRIPCIÓN ARQUITECTÓNICA

El proyecto se encuentra ubicado en un lote de 1700m² de área aproximadamente, en la cual se contempla la construcción de un centro educacional.

1.3. DESCRIPCIÓN SISTEMA ESTRUCTURAL

El proyecto se soluciona mediante la construcción de pórticos en concreto reforzado. Las placas de entrepiso estarán constituidas por placas macizas de 10 cm de espesor y vigas descolgadas de 50 cm de altura. Para la cubierta liviana se implementarán vigas de concreto de 50 cm de altura y la teja estará soportada por medio de correas y culatas de mampostería confinada. Se manejan luces que varían entre 3 m y 8.00 m en los dos sentidos de la estructura.

Para su análisis se empleó el programa de computador ***ETABS v9.7.4.***, el cual tiene en cuenta los efectos de segundo orden. Las consideraciones sísmicas empleadas en el análisis estructural del proyecto son las siguientes:

- | | |
|---|------------------------------------|
| ✓ Método de análisis: | <i>Análisis Modal</i> |
| ✓ Zona de amenaza sísmica: | <i>Alta</i> |
| ✓ Zona de microzonificación sísmica: | <i>No Aplica</i> |
| ✓ Capacidad de disipación de energía: | <i>Especial</i> |
| ✓ Coeficiente de disipación de energía: | <i>R_o = 7.00</i> |

El coeficiente de disipación de energía se afecta por las irregularidades presentes en la geometría de cada estructura, las cuales se describen a continuación:

- | | |
|---------------------------------|-----------------|
| ✓ Redundancia de la estructura: | $\phi_r = 0.75$ |
|---------------------------------|-----------------|

El valor final del coeficiente R es igual a **5.25**

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 la estructura satisface los requerimientos de sollicitación ocasionados por las derivas presentes.

La carga viva de diseño es **2.00kN/m²** para placa de entepiso, **5.00kN/m²** para corredores y cubierta de tanques, y **0.50kN/m²** para placa de cubierta liviana de acuerdo con la sección B.4.8.3 de la NSR-10.

Para la cimentación se siguieron las recomendaciones descritas en el respectivo estudio de suelos, que recomienda apoyar la estructura a **-1.00 m** del nivel de terreno, según lo indicado en los planos estructurales. La capacidad portante de seguridad admisible del suelo es **0.145 MPa** y el tipo de suelo es **E**.

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.

1.4. MATERIALES

Los materiales utilizados son:

Concreto	21.1 MPa para vigas, columnas, placas y cimentación.
Concreto	14.0 MPa (para concreto de limpieza)
Acero	$f_y = 420$ MPa para todos los diámetros.

Atentamente:

EDGAR ROLANDO BARRERA
ING. ESTRUCTURAL
T.P. 15202-102710 BYC

JAIR USECHE MACÍAS
ING. ESTRUCTURAL
T.P. 25202-56174 CND

MEMORIAL DE RESPONSABILIDAD

IPIALES, 18 de Noviembre de 2016

Señores

PLANEACIÓN MUNICIPAL

La Ciudad

Yo, **EDGAR ROLANDO BARRERA**, ingeniero civil con Matrícula Profesional N° **15202-102710** de **BOYACÁ**, y Yo, **JAIR USECHE MACÍAS**, ingeniero civil con Matrícula Profesional N° **25202-56174** de **CUNDINAMARCA** debidamente registrados en el consejo profesional de Ingeniería y Arquitectura de Boyacá y Cundinamarca, presentamos 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. EL SUR ubicado en el municipio de IPIALES (NARIÑO), declaramos que asumimos la responsabilidad por los perjuicios que causa de ellos puedan deducirse, exonerando a PLANEACION MUNICIPAL de cualquier responsabilidad.

Aceptamos y reconocemos que la revisión efectuada por PLANEACION MUNICIPAL 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

JAIR USECHE MACÍAS
ING. ESTRUCTURAL
T.P. 25202-56174 CND

REPUBLICA DE COLOMBIA
Consejo Profesional Nacional de Ingeniería
y Arquitectura



MATRÍCULA No. 2528256174CND
INGENIERO CIVIL
DE FECHA 27/07/95
APELLIDOS
USECHE MACIAS
NOMBRES
JAIR
C.C. 19,428,425
UNIV. NACIONAL - BOGOTÁ

Otmar Villalaz
Presidente del Consejo

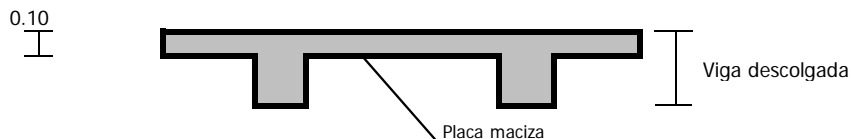
2. AVALÚO DE CARGAS

AVALÚO DE CARGAS

PROYECTO: I.E. EL SUR (IPIALES)

AVALÚO DE CARGAS

1. PLACA MACIZA - ENTREPISO SALONES



Placa maciza e=0.10 m	0.10x24	2.40 kN/m ²
Muros		2.00 kN/m ²
Acabados	20x0.05	1.00 kN/m ²
		<u>5.40 kN/m²</u>
	CM	2.00 kN/m ²
	CV	<u>7.40 kN/m²</u>
	CR	

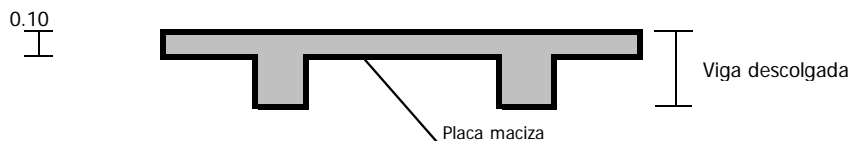
$$CU = 1.2 \times 5.4 + 1.6 \times 2 = 9.7 \text{ kN/m}^2$$

Espesor de placa equivalente:

$$e = CM/24 = 0.225 \text{ m}$$

Muros perimetrales	2.75x0.15x13	5.36 kN/m
--------------------	--------------	-----------

2. PLACA MACIZA - ENTREPISO CORREDORES



Placa maciza e=0.10 m	0.10x24	2.40 kN/m ²
Acabados	20x0.05	1.00 kN/m ²
		<u>3.40 kN/m²</u>
	CM	5.00 kN/m ²
	CV	<u>8.40 kN/m²</u>
	CR	

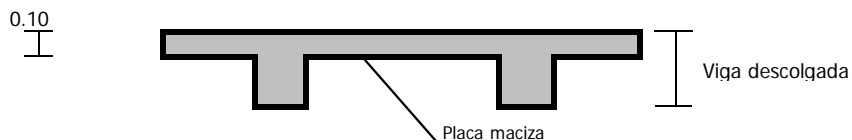
$$CU = 1.2 \times 3.4 + 1.6 \times 5 = 12.1 \text{ kN/m}^2$$

Espesor de placa equivalente:

$$e = CM/24 = 0.142 \text{ m}$$

Muros perimetrales	1.10x0.15x13	2.15 kN/m
--------------------	--------------	-----------

3. PLACA MACIZA - CUBIERTA TANQUES



Placa maciza e=0.10m	0.10x24	2.40 kN/m ²
Acabados	22x0.05	1.10 kN/m ²
		<u>3.50 kN/m²</u>
	CM	5.00 kN/m ²
	CV	<u>8.50 kN/m²</u>
	CR	

$$CU = 1.2 \times 3.5 + 1.6 \times 5 = 12.2 \text{ kN/m}^2$$

Espesor de placa equivalente:

$$e = CM/24 = 0.146 \text{ m}$$

Muros perimetrales 1.5x0.15x13 2.93 kN/m

4. CUBIERTA LIVIANA

Teja termo-acústica 0.10 kN/m²
 Correas metálicas 0.10 kN/m²
 Acabados e iluminacion 0.10 kN/m²

Seccion B.4.8.3.2 de NSR-10

CM	0.30 kN/m ²
CV	0.35 kN/m ²
CR	0.65 kN/m ²

Muros culata 0.63x0.15x13 1.23 kN/m

$$CU = 1.2x0.3 + 1.6x0.35 = 0.92 \text{ kN/m}^2$$

Espesor de placa equivalente:

$$e = CM/24 = 0.013 \text{ m}$$

Pendiente de Cubierta α (°) = 8.54 → Equivale a 15%
 Altitud de al cabecera municipal (m.s.n.m.) 2900
 B.4.8.3 de NSR-10 (Carga de granizo) CG 0.50 kN/m²

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.

PROYECTO: I.E. EL SUR (IPIALES) AVALÚO DE CARGAS DE VIENTO ANÁLISIS SIMPLIFICADO (sprfv)

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 título 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 través 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 consideraciones 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 $\phi \leq 45^\circ$
- 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 controlan 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:
$$P_s = \lambda K_{zt} I P_{s10}$$

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 categoría de exposición **B**, con **h=10** m de la figura B.6.4.2.

	CIUDAD	ZONA	VELOCIDAD DEL VIENTO
Zona de amenaza eólica=	IPIALES	3	100

Luego:

- λ = 1.0
- K_{zt} = 1.0
- I = 1.3
- 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 P_s , de $+0.40 \text{ kN/m}^2$ para las zonas de A, B, C y D y de 0.00 kN/m^2 para las zonas E, F, G y H.

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

3. ANÁLISIS SÍSMICO

ANÁLISIS SÍSMICO
COMPROBACIÓN DE DERIVAS

PROYECTO: I. E. EL SUR (IPIALES) ANÁLISIS SÍSMICO (ESPECTRO DE DISEÑO NSR-10)

ZONA DE AMENAZA SÍSMICA
ALTA

EFFECTOS LOCALES

Perfil de Suelo	E
Coefficiente Aa	0.30
Coefficiente Av	0.25

COEFICIENTE DE IMPORTANCIA

Grupo de Uso	III
Coefficiente de importancia	1.25

PERIODO FUNDAMENTAL DE LA EDIFICACIÓN

$T_a = C_t h^\alpha$		
$C_t =$	0.047	
$h =$	12.25	m
$\alpha =$	0.90	
$T_a =$	0.45	Seg

VARIACIÓN COEFICIENTE DE CAPACIDAD DE DISIPACIÓN DE ENERGÍA

R_o : 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

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

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

ESPECTRO DE DISEÑO (AMORTIGUAMIENTO $\xi=5\%$ DEL CRÍTICO)

F_a : 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 ALTA

T _o :	0.21	Seg
T _C :	1.00	Seg
T _L :	7.20	Seg
Aa:	0.30	
Av:	0.25	
Fa:	1.20	
Fv:	3.00	

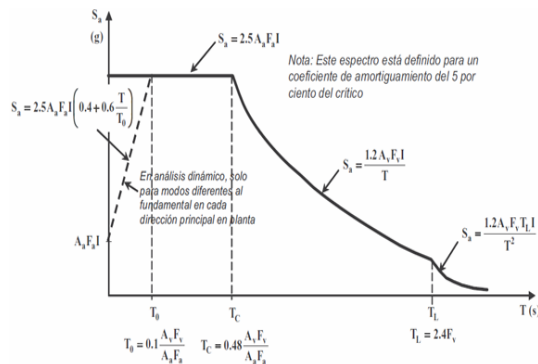
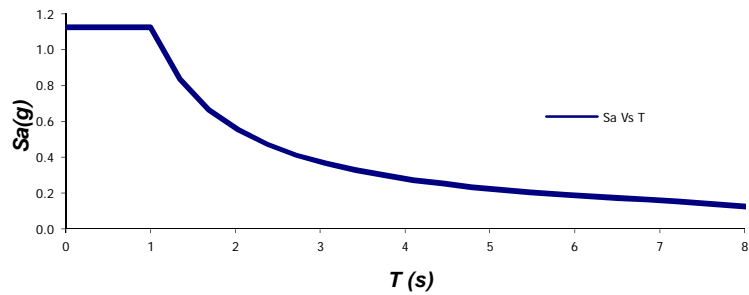


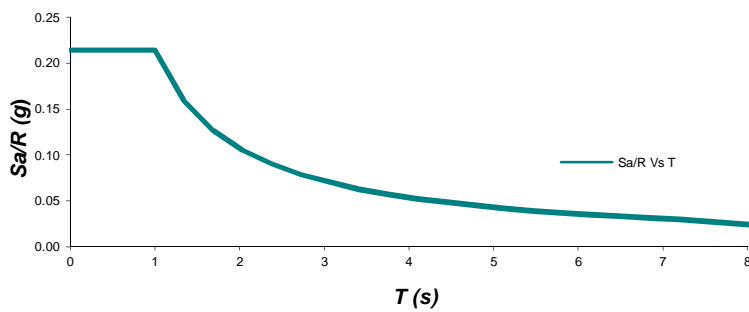
Figura A.2.6-1 — Espectro Elástico de Aceleraciones de Diseño como fracción de g

T	S _a	S _a /R _{adoptado}
(Seg)	(%g)	(%g)
0.00	1.125	0.214
0.05	1.125	0.214
0.10	1.125	0.214
0.16	1.125	0.214
0.21	1.125	0.214
0.41	1.125	0.214
0.60	1.125	0.214
0.80	1.125	0.214
1.00	1.125	0.214
1.34	0.837	0.159
1.69	0.666	0.127
2.03	0.553	0.105
2.38	0.473	0.090
2.72	0.413	0.079
3.07	0.367	0.070
3.41	0.330	0.063
3.76	0.300	0.057
4.10	0.274	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_{adap}



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 rígidos 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: I. E. EL SUR (IPIALES) ANÁLISIS SÍSMICO (ESPECTRO DE UMBRAL DE DAÑO NSR-10)

ZONA DE AMENAZA SÍSMICA
ALTA

EFFECTOS LOCALES

Perfil de Suelo	E
Coeficiente Ad	0.08
Coeficiente Fv	3.50

COEFICIENTE DE IMPORTANCIA

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

ESPECTRO DE UMBRAL DE DAÑO (AMORTIGUAMIENTO $\xi=2\%$ DEL CRÍTICO)

S_{ad}: Valor del espectro de aceleraciones del umbral de daño para un periodo de vibración dado.

A_d: Máxima aceleración pico efectiva para el umbral de daño.

T: Periodo de vibración del sistema elástico, en segundos.

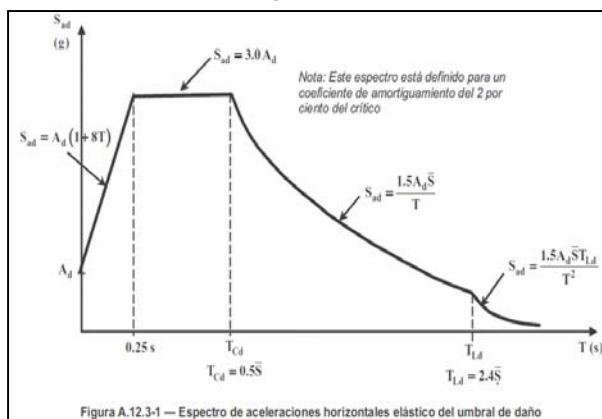
T_{Cd}: Periodo de vibración, en segundos, correspondiente a la transición entre la zona de aceleración constante del espectro sísmico del umbral de daño, para periodos cortos, y la parte descendiente del mismo.

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: 0.08

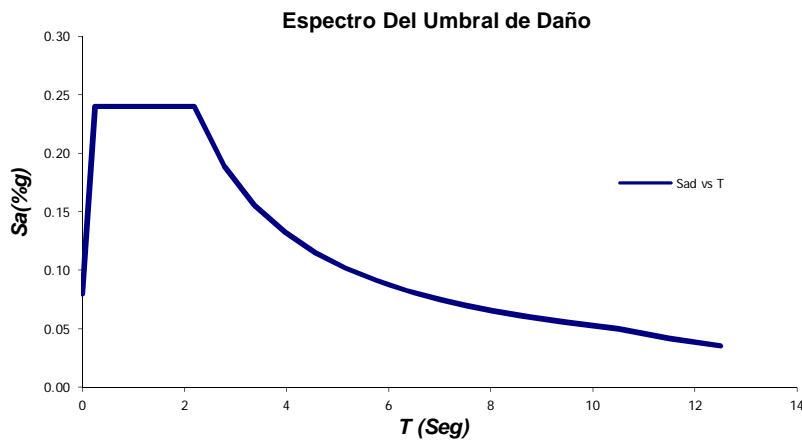
T_{Cd}: 2.19 Seg

T_{Ld}: 10.5 Seg



T (Seg)	S _{ad} (%g)
0.00	0.080
0.05	0.112
0.10	0.144
0.15	0.176
0.20	0.208
0.25	0.240
0.49	0.240
0.73	0.240
0.98	0.240
1.22	0.240
1.46	0.240
1.70	0.240
1.95	0.240

2.19	0.240
2.78	0.189
3.38	0.156
3.97	0.132
4.56	0.115
5.16	0.102
5.75	0.091
6.34	0.083
6.94	0.076
7.53	0.070
8.13	0.065
8.72	0.060
9.31	0.056
9.91	0.053
10.50	0.050
11.50	0.042
12.50	0.035



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 rígidos 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: I.E. EL SUR (IPIALES)
CÁLCULO DEL CORTANTE BASAL DE LA ESTRUCTURA (ESPECTRO DE DISEÑO NSR-10)

CÁLCULO DEL CORTANTE BASAL DE LA ESTRUCTURA

$H_{\text{edificio}} =$	12.25	m	
Tipo de Perfil:	E		
$A_a =$	0.30		
$A_v =$	0.25		
$F_a =$	1.20		
$F_v =$	3.00		
$T_c =$	1.00	Seg	
$C_t =$	0.047		
$\alpha =$	0.90		
$T_a =$	0.45	Seg	
$C_u =$	1.20		
$C_u T_a =$	0.54	Seg	
$T_{\text{modelación estructural}} =$	0.49	Seg	
$\Delta T =$	9.34	%	Ok!
$T_{\text{adoptado}} =$	0.49	Seg	
$S_a =$	1.125		S_a obtenido del espectro de diseño
$g =$	9.81	m/s ²	
$M =$	817.75	Ton	Masa obtenida del modelo
$V_s =$	9024.89	kN	
90% $V_s =$	8122.40	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	
$V_{s(x)} =$	8143.31		8143.31	0.997	9.785	Se aplica en SISMO X
$V_{s(y)} =$		7229.67	7229.67	1.123	11.021	Se aplica en SISMO Y

MODELO CORREGIDO
Response Spectrum Base Reactions

	F1	F2	Total	90% V_s
$V_{s(x)} =$	8143.31		8143.31	8122.4
$V_{s(y)} =$		8121.4	8121.40	8122.4



PROYECTO: I.E. EL SUR (IPIALES)

CÁLCULO DE DERIVAS MÁXIMAS (ESPECTRO DE DISEÑO NSR-10)

ALTURA DE N: +9.25 3.25 m
ALTURA DE N: +6.00 3.25 m
ALTURA DE N: +2.75 3.55 m
ALTURA DE N: +0.8 0.73 m

Deriva Máxima
Permitida 1.00 %

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS FUERZA SÍSMICA		Deriva Δ m	Deriva Δ %	Observación
			Desplazamiento X	Desplazamiento Y			
N: +9.25	127	COMDER1 MAX	0.06864	0.02789	0.01584	0.49	OK
N: +9.25	127	COMDER1 MIN	-0.06864	-0.02789	0.01584	0.49	OK
N: +9.25	127	COMDER2 MAX	0.02295	0.07436	0.02254	0.69	OK
N: +9.25	127	COMDER2 MIN	-0.02295	-0.07436	0.02254	0.69	OK
N: +6.00	127	COMDER1 MAX	0.05512	0.01963	0.02728	0.84	OK
N: +6.00	127	COMDER1 MIN	-0.05512	-0.01963	0.02728	0.84	OK
N: +6.00	127	COMDER2 MAX	0.01820	0.05233	0.02949	0.91	OK
N: +6.00	127	COMDER2 MIN	-0.01820	-0.05233	0.02949	0.91	OK
N: +2.75	127	COMDER1 MAX	0.02990	0.00923	0.02930	0.83	OK
N: +2.75	127	COMDER1 MIN	-0.02990	-0.00923	0.02930	0.83	OK
N: +2.75	127	COMDER2 MAX	0.00982	0.02405	0.02465	0.69	OK
N: +2.75	127	COMDER2 MIN	-0.00982	-0.02405	0.02465	0.69	OK
N: +0.8	127	COMDER1 MAX	0.00195	0.00046	0.00200	0.28	OK
N: +0.8	127	COMDER1 MIN	-0.00195	-0.00046	0.00200	0.28	OK
N: +0.8	127	COMDER2 MAX	0.00065	0.00117	0.00134	0.18	OK
N: +0.8	127	COMDER2 MIN	-0.00065	-0.00117	0.00134	0.18	OK
BASE	127	COMDER1 MAX	0.00000	0.00000	--	--	--
BASE	127	COMDER1 MIN	0.00000	0.00000	--	--	--
BASE	127	COMDER2 MAX	0.00000	0.00000	--	--	--
BASE	127	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +6.00	128	COMDER1 MAX	0.05512	0.02295	0.02794	0.86	OK
N: +6.00	128	COMDER1 MIN	-0.05512	-0.02295	0.02794	0.86	OK
N: +6.00	128	COMDER2 MAX	0.01820	0.05831	0.03224	0.99	OK
N: +6.00	128	COMDER2 MIN	-0.01820	-0.05831	0.03224	0.99	OK
N: +2.75	128	COMDER1 MAX	0.02990	0.01092	0.03007	0.85	OK
N: +2.75	128	COMDER1 MIN	-0.02990	-0.01092	0.03007	0.85	OK
N: +2.75	128	COMDER2 MAX	0.00982	0.02717	0.02741	0.77	OK
N: +2.75	128	COMDER2 MIN	-0.00982	-0.02717	0.02741	0.77	OK
N: +0.8	128	COMDER1 MAX	0.00169	0.00052	0.00177	0.24	OK
N: +0.8	128	COMDER1 MIN	-0.00169	-0.00052	0.00177	0.24	OK
N: +0.8	128	COMDER2 MAX	0.00059	0.00137	0.00149	0.20	OK
N: +0.8	128	COMDER2 MIN	-0.00059	-0.00137	0.00149	0.20	OK
BASE	128	COMDER1 MAX	0.00000	0.00000	--	--	--
BASE	128	COMDER1 MIN	0.00000	0.00000	--	--	--
BASE	128	COMDER2 MAX	0.00000	0.00000	--	--	--
BASE	128	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +6.00	129	COMDER1 MAX	0.05480	0.02295	0.02782	0.86	OK
N: +6.00	129	COMDER1 MIN	-0.05480	-0.02295	0.02782	0.86	OK
N: +6.00	129	COMDER2 MAX	0.01983	0.05831	0.03246	1.00	OK
N: +6.00	129	COMDER2 MIN	-0.01983	-0.05831	0.03246	1.00	OK
N: +2.75	129	COMDER1 MAX	0.02971	0.01092	0.02994	0.84	OK
N: +2.75	129	COMDER1 MIN	-0.02971	-0.01092	0.02994	0.84	OK
N: +2.75	129	COMDER2 MAX	0.01066	0.02717	0.02776	0.78	OK
N: +2.75	129	COMDER2 MIN	-0.01066	-0.02717	0.02776	0.78	OK
N: +0.8	129	COMDER1 MAX	0.00163	0.00052	0.00171	0.24	OK
N: +0.8	129	COMDER1 MIN	-0.00163	-0.00052	0.00171	0.24	OK
N: +0.8	129	COMDER2 MAX	0.00059	0.00130	0.00143	0.20	OK
N: +0.8	129	COMDER2 MIN	-0.00059	-0.00130	0.00143	0.20	OK
BASE	129	COMDER1 MAX	0.00000	0.00000	--	--	--
BASE	129	COMDER1 MIN	0.00000	0.00000	--	--	--
BASE	129	COMDER2 MAX	0.00000	0.00000	--	--	--
BASE	129	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +9.25	130	COMDER1 MAX	0.06812	0.02789	0.01567	0.48	OK
N: +9.25	130	COMDER1 MIN	-0.06812	-0.02789	0.01567	0.48	OK
N: +9.25	130	COMDER2 MAX	0.02503	0.07436	0.02264	0.70	OK
N: +9.25	130	COMDER2 MIN	-0.02503	-0.07436	0.02264	0.70	OK
N: +6.00	130	COMDER1 MAX	0.05480	0.01963	0.02716	0.84	OK
N: +6.00	130	COMDER1 MIN	-0.05480	-0.01963	0.02716	0.84	OK
N: +6.00	130	COMDER2 MAX	0.01983	0.05233	0.02972	0.91	OK
N: +6.00	130	COMDER2 MIN	-0.01983	-0.05233	0.02972	0.91	OK
N: +2.75	130	COMDER1 MAX	0.02971	0.00923	0.02923	0.82	OK



PROYECTO: I.E. EL SUR (IPIALES)

CÁLCULO DE DERIVAS MÁXIMAS (ESPECTRO DE DISEÑO NSR-10)

ALTURA DE N: +9.25 3.25 m
ALTURA DE N: +6.00 3.25 m
ALTURA DE N: +2.75 3.55 m
ALTURA DE N: +0.8 0.73 m

Deriva Máxima
Permitida 1.00 %

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS FUERZA SÍSMICA		Deriva Δ m	Deriva Δ %	Observación
			Desplazamiento X	Desplazamiento Y			
N: +2.75	130	COMDER1 MIN	-0.02971	-0.00923	0.02923	0.82	OK
N: +2.75	130	COMDER2 MAX	0.01066	0.02405	0.02497	0.70	OK
N: +2.75	130	COMDER2 MIN	-0.01066	-0.02405	0.02497	0.70	OK
N: +0.8	130	COMDER1 MAX	0.00182	0.00046	0.00188	0.26	OK
N: +0.8	130	COMDER1 MIN	-0.00182	-0.00046	0.00188	0.26	OK
N: +0.8	130	COMDER2 MAX	0.00065	0.00117	0.00134	0.18	OK
N: +0.8	130	COMDER2 MIN	-0.00065	-0.00117	0.00134	0.18	OK
BASE	130	COMDER1 MAX	0.00000	0.00000	--	--	--
BASE	130	COMDER1 MIN	0.00000	0.00000	--	--	--
BASE	130	COMDER2 MAX	0.00000	0.00000	--	--	--
BASE	130	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +6.00	131	COMDER1 MAX	0.05512	0.01801	0.02709	0.83	OK
N: +6.00	131	COMDER1 MIN	-0.05512	-0.01801	0.02709	0.83	OK
N: +6.00	131	COMDER2 MAX	0.01820	0.04206	0.02541	0.78	OK
N: +6.00	131	COMDER2 MIN	-0.01820	-0.04206	0.02541	0.78	OK
N: +2.75	131	COMDER1 MAX	0.02990	0.00813	0.03098	0.87	OK
N: +2.75	131	COMDER1 MIN	-0.02990	-0.00813	0.03098	0.87	OK
N: +2.75	131	COMDER2 MAX	0.00982	0.01807	0.02056	0.58	OK
N: +2.75	131	COMDER2 MIN	-0.00982	-0.01807	0.02056	0.58	OK
N: +0.8	131	COMDER1 MAX	0.00000	0.00000	--	--	--
N: +0.8	131	COMDER1 MIN	0.00000	0.00000	--	--	--
N: +0.8	131	COMDER2 MAX	0.00000	0.00000	--	--	--
N: +0.8	131	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +6.00	132	COMDER1 MAX	0.05480	0.01801	0.02697	0.83	OK
N: +6.00	132	COMDER1 MIN	-0.05480	-0.01801	0.02697	0.83	OK
N: +6.00	132	COMDER2 MAX	0.01983	0.04206	0.02568	0.79	OK
N: +6.00	132	COMDER2 MIN	-0.01983	-0.04206	0.02568	0.79	OK
N: +2.75	132	COMDER1 MAX	0.02971	0.00813	0.03080	0.87	OK
N: +2.75	132	COMDER1 MIN	-0.02971	-0.00813	0.03080	0.87	OK
N: +2.75	132	COMDER2 MAX	0.01066	0.01807	0.02098	0.59	OK
N: +2.75	132	COMDER2 MIN	-0.01066	-0.01807	0.02098	0.59	OK
N: +0.8	132	COMDER1 MAX	0.00000	0.00000	--	--	--
N: +0.8	132	COMDER1 MIN	0.00000	0.00000	--	--	--
N: +0.8	132	COMDER2 MAX	0.00000	0.00000	--	--	--
N: +0.8	132	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +6.00	133	COMDER1 MAX	0.05512	0.01606	0.02675	0.82	OK
N: +6.00	133	COMDER1 MIN	-0.05512	-0.01606	0.02675	0.82	OK
N: +6.00	133	COMDER2 MAX	0.01820	0.04050	0.02467	0.76	OK
N: +6.00	133	COMDER2 MIN	-0.01820	-0.04050	0.02467	0.76	OK
N: +2.75	133	COMDER1 MAX	0.02990	0.00715	0.03074	0.87	OK
N: +2.75	133	COMDER1 MIN	-0.02990	-0.00715	0.03074	0.87	OK
N: +2.75	133	COMDER2 MAX	0.00982	0.01729	0.01988	0.56	OK
N: +2.75	133	COMDER2 MIN	-0.00982	-0.01729	0.01988	0.56	OK
N: +0.8	133	COMDER1 MAX	0.00000	0.00000	--	--	--
N: +0.8	133	COMDER1 MIN	0.00000	0.00000	--	--	--
N: +0.8	133	COMDER2 MAX	0.00000	0.00000	--	--	--
N: +0.8	133	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +6.00	134	COMDER1 MAX	0.05480	0.01606	0.02662	0.82	OK
N: +6.00	134	COMDER1 MIN	-0.05480	-0.01606	0.02662	0.82	OK
N: +6.00	134	COMDER2 MAX	0.01983	0.04050	0.02495	0.77	OK
N: +6.00	134	COMDER2 MIN	-0.01983	-0.04050	0.02495	0.77	OK
N: +2.75	134	COMDER1 MAX	0.02971	0.00715	0.03055	0.86	OK
N: +2.75	134	COMDER1 MIN	-0.02971	-0.00715	0.03055	0.86	OK
N: +2.75	134	COMDER2 MAX	0.01066	0.01729	0.02031	0.57	OK
N: +2.75	134	COMDER2 MIN	-0.01066	-0.01729	0.02031	0.57	OK
N: +0.8	134	COMDER1 MAX	0.00000	0.00000	--	--	--
N: +0.8	134	COMDER1 MIN	0.00000	0.00000	--	--	--
N: +0.8	134	COMDER2 MAX	0.00000	0.00000	--	--	--
N: +0.8	134	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +9.25	135	COMDER1 MAX	0.06812	0.02067	0.01503	0.46	OK
N: +9.25	135	COMDER1 MIN	-0.06812	-0.02067	0.01503	0.46	OK



PROYECTO: I.E. EL SUR (IPIALES)

CÁLCULO DE DERIVAS MÁXIMAS (ESPECTRO DE DISEÑO NSR-10)

ALTURA DE N: +9.25 3.25 m
ALTURA DE N: +6.00 3.25 m
ALTURA DE N: +2.75 3.55 m
ALTURA DE N: +0.8 0.73 m

Deriva Máxima
Permitida 1.00 %

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS FUERZA SÍSMICA		Deriva Δ m	Deriva Δ %	Observación
			Desplazamiento X	Desplazamiento Y			
N: +9.25	135	COMDER2 MAX	0.02503	0.05850	0.02024	0.62	OK
N: +9.25	135	COMDER2 MIN	-0.02503	-0.05850	0.02024	0.62	OK
N: +6.00	135	COMDER1 MAX	0.05480	0.01372	0.02624	0.81	OK
N: +6.00	135	COMDER1 MIN	-0.05480	-0.01372	0.02624	0.81	OK
N: +6.00	135	COMDER2 MAX	0.01983	0.03894	0.02405	0.74	OK
N: +6.00	135	COMDER2 MIN	-0.01983	-0.03894	0.02405	0.74	OK
N: +2.75	135	COMDER1 MAX	0.02971	0.00605	0.03031	0.85	OK
N: +2.75	135	COMDER1 MIN	-0.02971	-0.00605	0.03031	0.85	OK
N: +2.75	135	COMDER2 MAX	0.01066	0.01671	0.01982	0.56	OK
N: +2.75	135	COMDER2 MIN	-0.01066	-0.01671	0.01982	0.56	OK
N: +0.8	135	COMDER1 MAX	0.00000	0.00000	--	--	--
N: +0.8	135	COMDER1 MIN	0.00000	0.00000	--	--	--
N: +0.8	135	COMDER2 MAX	0.00000	0.00000	--	--	--
N: +0.8	135	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +9.25	136	COMDER1 MAX	0.06864	0.02067	0.01520	0.47	OK
N: +9.25	136	COMDER1 MIN	-0.06864	-0.02067	0.01520	0.47	OK
N: +9.25	136	COMDER2 MAX	0.02295	0.05850	0.02013	0.62	OK
N: +9.25	136	COMDER2 MIN	-0.02295	-0.05850	0.02013	0.62	OK
N: +6.00	136	COMDER1 MAX	0.05512	0.01372	0.02636	0.81	OK
N: +6.00	136	COMDER1 MIN	-0.05512	-0.01372	0.02636	0.81	OK
N: +6.00	136	COMDER2 MAX	0.01820	0.03894	0.02376	0.73	OK
N: +6.00	136	COMDER2 MIN	-0.01820	-0.03894	0.02376	0.73	OK
N: +2.75	136	COMDER1 MAX	0.02990	0.00605	0.03050	0.86	OK
N: +2.75	136	COMDER1 MIN	-0.02990	-0.00605	0.03050	0.86	OK
N: +2.75	136	COMDER2 MAX	0.00982	0.01671	0.01938	0.55	OK
N: +2.75	136	COMDER2 MIN	-0.00982	-0.01671	0.01938	0.55	OK
N: +0.8	136	COMDER1 MAX	0.00000	0.00000	--	--	--
N: +0.8	136	COMDER1 MIN	0.00000	0.00000	--	--	--
N: +0.8	136	COMDER2 MAX	0.00000	0.00000	--	--	--
N: +0.8	136	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +9.25	137	COMDER1 MAX	0.06864	0.01853	0.01484	0.46	OK
N: +9.25	137	COMDER1 MIN	-0.06864	-0.01853	0.01484	0.46	OK
N: +9.25	137	COMDER2 MAX	0.02295	0.05675	0.01919	0.59	OK
N: +9.25	137	COMDER2 MIN	-0.02295	-0.05675	0.01919	0.59	OK
N: +6.00	137	COMDER1 MAX	0.05512	0.01242	0.02618	0.81	OK
N: +6.00	137	COMDER1 MIN	-0.05512	-0.01242	0.02618	0.81	OK
N: +6.00	137	COMDER2 MAX	0.01820	0.03816	0.02327	0.72	OK
N: +6.00	137	COMDER2 MIN	-0.01820	-0.03816	0.02327	0.72	OK
N: +2.75	137	COMDER1 MAX	0.02990	0.00540	0.03038	0.86	OK
N: +2.75	137	COMDER1 MIN	-0.02990	-0.00540	0.03038	0.86	OK
N: +2.75	137	COMDER2 MAX	0.00982	0.01645	0.01915	0.54	OK
N: +2.75	137	COMDER2 MIN	-0.00982	-0.01645	0.01915	0.54	OK
N: +0.8	137	COMDER1 MAX	0.00000	0.00000	--	--	--
N: +0.8	137	COMDER1 MIN	0.00000	0.00000	--	--	--
N: +0.8	137	COMDER2 MAX	0.00000	0.00000	--	--	--
N: +0.8	137	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +9.25	138	COMDER1 MAX	0.06812	0.01853	0.01466	0.45	OK
N: +9.25	138	COMDER1 MIN	-0.06812	-0.01853	0.01466	0.45	OK
N: +9.25	138	COMDER2 MAX	0.02503	0.05675	0.01930	0.59	OK
N: +9.25	138	COMDER2 MIN	-0.02503	-0.05675	0.01930	0.59	OK
N: +6.00	138	COMDER1 MAX	0.05480	0.01242	0.02605	0.80	OK
N: +6.00	138	COMDER1 MIN	-0.05480	-0.01242	0.02605	0.80	OK
N: +6.00	138	COMDER2 MAX	0.01983	0.03816	0.02357	0.73	OK
N: +6.00	138	COMDER2 MIN	-0.01983	-0.03816	0.02357	0.73	OK
N: +2.75	138	COMDER1 MAX	0.02971	0.00540	0.03019	0.85	OK
N: +2.75	138	COMDER1 MIN	-0.02971	-0.00540	0.03019	0.85	OK
N: +2.75	138	COMDER2 MAX	0.01066	0.01645	0.01960	0.55	OK
N: +2.75	138	COMDER2 MIN	-0.01066	-0.01645	0.01960	0.55	OK
N: +0.8	138	COMDER1 MAX	0.00000	0.00000	--	--	--
N: +0.8	138	COMDER1 MIN	0.00000	0.00000	--	--	--
N: +0.8	138	COMDER2 MAX	0.00000	0.00000	--	--	--



PROYECTO: I.E. EL SUR (IPIALES)

CÁLCULO DE DERIVAS MÁXIMAS (ESPECTRO DE DISEÑO NSR-10)

ALTURA DE N: +9.25 3.25 m
ALTURA DE N: +6.00 3.25 m
ALTURA DE N: +2.75 3.55 m
ALTURA DE N: +0.8 0.73 m

Deriva Máxima
Permitida 1.00 %

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS FUERZA SÍSMICA		Deriva Δ m	Deriva Δ %	Observación
			Desplazamiento X	Desplazamiento Y			
N: +0.8	138	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +9.25	139	COMDER1 MAX	0.06864	0.01937	0.01476	0.45	OK
N: +9.25	139	COMDER1 MIN	-0.06864	-0.01937	0.01476	0.45	OK
N: +9.25	139	COMDER2 MAX	0.02295	0.05948	0.01893	0.58	OK
N: +9.25	139	COMDER2 MIN	-0.02295	-0.05948	0.01893	0.58	OK
N: +6.00	139	COMDER1 MAX	0.05512	0.01346	0.02629	0.81	OK
N: +6.00	139	COMDER1 MIN	-0.05512	-0.01346	0.02629	0.81	OK
N: +6.00	139	COMDER2 MAX	0.01820	0.04115	0.02437	0.75	OK
N: +6.00	139	COMDER2 MIN	-0.01820	-0.04115	0.02437	0.75	OK
N: +2.75	139	COMDER1 MAX	0.02990	0.00605	0.03050	0.86	OK
N: +2.75	139	COMDER1 MIN	-0.02990	-0.00605	0.03050	0.86	OK
N: +2.75	139	COMDER2 MAX	0.00982	0.01827	0.02074	0.58	OK
N: +2.75	139	COMDER2 MIN	-0.00982	-0.01827	0.02074	0.58	OK
N: +0.8	139	COMDER1 MAX	0.00000	0.00000	--	--	--
N: +0.8	139	COMDER1 MIN	0.00000	0.00000	--	--	--
N: +0.8	139	COMDER2 MAX	0.00000	0.00000	--	--	--
N: +0.8	139	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +9.25	140	COMDER1 MAX	0.06812	0.01937	0.01458	0.45	OK
N: +9.25	140	COMDER1 MIN	-0.06812	-0.01937	0.01458	0.45	OK
N: +9.25	140	COMDER2 MAX	0.02503	0.05948	0.01905	0.59	OK
N: +9.25	140	COMDER2 MIN	-0.02503	-0.05948	0.01905	0.59	OK
N: +6.00	140	COMDER1 MAX	0.05480	0.01346	0.02616	0.80	OK
N: +6.00	140	COMDER1 MIN	-0.05480	-0.01346	0.02616	0.80	OK
N: +6.00	140	COMDER2 MAX	0.01983	0.04115	0.02465	0.76	OK
N: +6.00	140	COMDER2 MIN	-0.01983	-0.04115	0.02465	0.76	OK
N: +2.75	140	COMDER1 MAX	0.02971	0.00605	0.03031	0.85	OK
N: +2.75	140	COMDER1 MIN	-0.02971	-0.00605	0.03031	0.85	OK
N: +2.75	140	COMDER2 MAX	0.01066	0.01827	0.02115	0.60	OK
N: +2.75	140	COMDER2 MIN	-0.01066	-0.01827	0.02115	0.60	OK
N: +0.8	140	COMDER1 MAX	0.00000	0.00000	--	--	--
N: +0.8	140	COMDER1 MIN	0.00000	0.00000	--	--	--
N: +0.8	140	COMDER2 MAX	0.00000	0.00000	--	--	--
N: +0.8	140	COMDER2 MIN	0.00000	0.00000	--	--	--
N: +9.25	141	COMDER1 MAX	0.06864	0.02470	0.01539	0.47	OK
N: +9.25	141	COMDER1 MIN	-0.06864	-0.02470	0.01539	0.47	OK
N: +9.25	141	COMDER2 MAX	0.02295	0.06884	0.02121	0.65	OK
N: +9.25	141	COMDER2 MIN	-0.02295	-0.06884	0.02121	0.65	OK
N: +6.00	141	COMDER1 MAX	0.05512	0.01736	0.02688	0.83	OK
N: +6.00	141	COMDER1 MIN	-0.05512	-0.01736	0.02688	0.83	OK
N: +6.00	141	COMDER2 MAX	0.01820	0.04817	0.02757	0.85	OK
N: +6.00	141	COMDER2 MIN	-0.01820	-0.04817	0.02757	0.85	OK
N: +2.75	141	COMDER1 MAX	0.02990	0.00806	0.03097	0.87	OK
N: +2.75	141	COMDER1 MIN	-0.02990	-0.00806	0.03097	0.87	OK
N: +2.75	141	COMDER2 MAX	0.00982	0.02191	0.02400	0.68	OK
N: +2.75	141	COMDER2 MIN	-0.00982	-0.02191	0.02400	0.68	OK
N: +0.8	141	COMDER1 MAX	0.00000	0.00000	--	--	--
N: +0.8	141	COMDER1 MIN	0.00000	0.00000	--	--	--
N: +0.8	141	COMDER2 MAX	0.00000	0.00000	--	--	--
N: +0.8	141	COMDER2 MIN	0.00000	0.00000	--	--	--



PROYECTO: I.E. EL SUR (IPIALES)

CÁLCULO DE DERIVAS MÁXIMAS (ESPECTRO DE UMBRAL DE DAÑO NSR-10)

ALTURA DE N: +9.25 3.25 m
ALTURA DE N: +6.00 3.25 m
ALTURA DE N: +2.75 3.55 m
ALTURA DE N: +0.8 0.73 m

Deriva Máxima
Permitida 0.40 %

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS Desplazamiento X	FUERZA SÍSMICA Desplazamiento Y	Deriva Δ m	Deriva Δ %	Observación
N: +9.25	127	COMUMB1 MAX	0.02500	0.01020	0.00575	0.18	OK
N: +9.25	127	COMUMB1 MIN	-0.02500	-0.01020	0.00575	0.18	OK
N: +9.25	127	COMUMB2 MAX	0.00830	0.02710	0.00818	0.25	OK
N: +9.25	127	COMUMB2 MIN	-0.00830	-0.02710	0.00818	0.25	OK
N: +6.00	127	COMUMB1 MAX	0.02010	0.00720	0.00995	0.31	OK
N: +6.00	127	COMUMB1 MIN	-0.02010	-0.00720	0.00995	0.31	OK
N: +6.00	127	COMUMB2 MAX	0.00660	0.01910	0.01073	0.33	OK
N: +6.00	127	COMUMB2 MIN	-0.00660	-0.01910	0.01073	0.33	OK
N: +2.75	127	COMUMB1 MAX	0.01090	0.00340	0.01069	0.30	OK
N: +2.75	127	COMUMB1 MIN	-0.01090	-0.00340	0.01069	0.30	OK
N: +2.75	127	COMUMB2 MAX	0.00360	0.00880	0.00906	0.26	OK
N: +2.75	127	COMUMB2 MIN	-0.00360	-0.00880	0.00906	0.26	OK
N: +0.8	127	COMUMB1 MAX	0.00070	0.00020	0.00073	0.10	OK
N: +0.8	127	COMUMB1 MIN	-0.00070	-0.00020	0.00073	0.10	OK
N: +0.8	127	COMUMB2 MAX	0.00020	0.00040	0.00045	0.06	OK
N: +0.8	127	COMUMB2 MIN	-0.00020	-0.00040	0.00045	0.06	OK
BASE	127	COMUMB1 MAX	0.00000	0.00000	--	--	--
BASE	127	COMUMB1 MIN	0.00000	0.00000	--	--	--
BASE	127	COMUMB2 MAX	0.00000	0.00000	--	--	--
BASE	127	COMUMB2 MIN	0.00000	0.00000	--	--	--
N: +6.00	128	COMUMB1 MAX	0.02010	0.00830	0.01016	0.31	OK
N: +6.00	128	COMUMB1 MIN	-0.02010	-0.00830	0.01016	0.31	OK
N: +6.00	128	COMUMB2 MAX	0.00660	0.02130	0.01179	0.36	OK
N: +6.00	128	COMUMB2 MIN	-0.00660	-0.02130	0.01179	0.36	OK
N: +2.75	128	COMUMB1 MAX	0.01090	0.00400	0.01098	0.31	OK
N: +2.75	128	COMUMB1 MIN	-0.01090	-0.00400	0.01098	0.31	OK
N: +2.75	128	COMUMB2 MAX	0.00360	0.00990	0.01000	0.28	OK
N: +2.75	128	COMUMB2 MIN	-0.00360	-0.00990	0.01000	0.28	OK
N: +0.8	128	COMUMB1 MAX	0.00060	0.00020	0.00063	0.09	OK
N: +0.8	128	COMUMB1 MIN	-0.00060	-0.00020	0.00063	0.09	OK
N: +0.8	128	COMUMB2 MAX	0.00020	0.00050	0.00054	0.07	OK
N: +0.8	128	COMUMB2 MIN	-0.00020	-0.00050	0.00054	0.07	OK
BASE	128	COMUMB1 MAX	0.00000	0.00000	--	--	--
BASE	128	COMUMB1 MIN	0.00000	0.00000	--	--	--
BASE	128	COMUMB2 MAX	0.00000	0.00000	--	--	--
BASE	128	COMUMB2 MIN	0.00000	0.00000	--	--	--
N: +6.00	129	COMUMB1 MAX	0.02000	0.00830	0.01016	0.31	OK
N: +6.00	129	COMUMB1 MIN	-0.02000	-0.00830	0.01016	0.31	OK
N: +6.00	129	COMUMB2 MAX	0.00720	0.02130	0.01187	0.37	OK
N: +6.00	129	COMUMB2 MIN	-0.00720	-0.02130	0.01187	0.37	OK
N: +2.75	129	COMUMB1 MAX	0.01080	0.00400	0.01088	0.31	OK
N: +2.75	129	COMUMB1 MIN	-0.01080	-0.00400	0.01088	0.31	OK
N: +2.75	129	COMUMB2 MAX	0.00390	0.00990	0.01010	0.28	OK
N: +2.75	129	COMUMB2 MIN	-0.00390	-0.00990	0.01010	0.28	OK
N: +0.8	129	COMUMB1 MAX	0.00060	0.00020	0.00063	0.09	OK
N: +0.8	129	COMUMB1 MIN	-0.00060	-0.00020	0.00063	0.09	OK
N: +0.8	129	COMUMB2 MAX	0.00020	0.00050	0.00054	0.07	OK
N: +0.8	129	COMUMB2 MIN	-0.00020	-0.00050	0.00054	0.07	OK
BASE	129	COMUMB1 MAX	0.00000	0.00000	--	--	--
BASE	129	COMUMB1 MIN	0.00000	0.00000	--	--	--
BASE	129	COMUMB2 MAX	0.00000	0.00000	--	--	--
BASE	129	COMUMB2 MIN	0.00000	0.00000	--	--	--
N: +9.25	130	COMUMB1 MAX	0.02480	0.01020	0.00566	0.17	OK
N: +9.25	130	COMUMB1 MIN	-0.02480	-0.01020	0.00566	0.17	OK
N: +9.25	130	COMUMB2 MAX	0.00910	0.02710	0.00822	0.25	OK
N: +9.25	130	COMUMB2 MIN	-0.00910	-0.02710	0.00822	0.25	OK



PROYECTO: I.E. EL SUR (IPIALES)

CÁLCULO DE DERIVAS MÁXIMAS (ESPECTRO DE UMBRAL DE DAÑO NSR-10)

ALTURA DE N: +9.25 3.25 m
ALTURA DE N: +6.00 3.25 m
ALTURA DE N: +2.75 3.55 m
ALTURA DE N: +0.8 0.73 m

Deriva Máxima
Permitida 0.40 %

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS Desplazamiento X	FUERZA SÍSMICA Desplazamiento Y	Deriva Δ m	Deriva Δ %	Observación
N: +6.00	130	COMUMB1 MAX	0.02000	0.00720	0.00995	0.31	OK
N: +6.00	130	COMUMB1 MIN	-0.02000	-0.00720	0.00995	0.31	OK
N: +6.00	130	COMUMB2 MAX	0.00720	0.01910	0.01082	0.33	OK
N: +6.00	130	COMUMB2 MIN	-0.00720	-0.01910	0.01082	0.33	OK
N: +2.75	130	COMUMB1 MAX	0.01080	0.00340	0.01059	0.30	OK
N: +2.75	130	COMUMB1 MIN	-0.01080	-0.00340	0.01059	0.30	OK
N: +2.75	130	COMUMB2 MAX	0.00390	0.00880	0.00918	0.26	OK
N: +2.75	130	COMUMB2 MIN	-0.00390	-0.00880	0.00918	0.26	OK
N: +0.8	130	COMUMB1 MAX	0.00070	0.00020	0.00073	0.10	OK
N: +0.8	130	COMUMB1 MIN	-0.00070	-0.00020	0.00073	0.10	OK
N: +0.8	130	COMUMB2 MAX	0.00020	0.00040	0.00045	0.06	OK
N: +0.8	130	COMUMB2 MIN	-0.00020	-0.00040	0.00045	0.06	OK
BASE	130	COMUMB1 MAX	0.00000	0.00000	--	--	--
BASE	130	COMUMB1 MIN	0.00000	0.00000	--	--	--
BASE	130	COMUMB2 MAX	0.00000	0.00000	--	--	--
BASE	130	COMUMB2 MIN	0.00000	0.00000	--	--	--
N: +6.00	131	COMUMB1 MAX	0.02010	0.00660	0.00992	0.31	OK
N: +6.00	131	COMUMB1 MIN	-0.02010	-0.00660	0.00992	0.31	OK
N: +6.00	131	COMUMB2 MAX	0.00660	0.01530	0.00930	0.29	OK
N: +6.00	131	COMUMB2 MIN	-0.00660	-0.01530	0.00930	0.29	OK
N: +2.75	131	COMUMB1 MAX	0.01090	0.00290	0.01128	0.32	OK
N: +2.75	131	COMUMB1 MIN	-0.01090	-0.00290	0.01128	0.32	OK
N: +2.75	131	COMUMB2 MAX	0.00360	0.00650	0.00743	0.21	OK
N: +2.75	131	COMUMB2 MIN	-0.00360	-0.00650	0.00743	0.21	OK
N: +0.8	131	COMUMB1 MAX	0.00000	0.00000	--	--	--
N: +0.8	131	COMUMB1 MIN	0.00000	0.00000	--	--	--
N: +0.8	131	COMUMB2 MAX	0.00000	0.00000	--	--	--
N: +0.8	131	COMUMB2 MIN	0.00000	0.00000	--	--	--
N: +6.00	132	COMUMB1 MAX	0.02000	0.00660	0.00992	0.31	OK
N: +6.00	132	COMUMB1 MIN	-0.02000	-0.00660	0.00992	0.31	OK
N: +6.00	132	COMUMB2 MAX	0.00720	0.01530	0.00940	0.29	OK
N: +6.00	132	COMUMB2 MIN	-0.00720	-0.01530	0.00940	0.29	OK
N: +2.75	132	COMUMB1 MAX	0.01080	0.00290	0.01118	0.32	OK
N: +2.75	132	COMUMB1 MIN	-0.01080	-0.00290	0.01118	0.32	OK
N: +2.75	132	COMUMB2 MAX	0.00390	0.00650	0.00758	0.21	OK
N: +2.75	132	COMUMB2 MIN	-0.00390	-0.00650	0.00758	0.21	OK
N: +0.8	132	COMUMB1 MAX	0.00000	0.00000	--	--	--
N: +0.8	132	COMUMB1 MIN	0.00000	0.00000	--	--	--
N: +0.8	132	COMUMB2 MAX	0.00000	0.00000	--	--	--
N: +0.8	132	COMUMB2 MIN	0.00000	0.00000	--	--	--
N: +6.00	133	COMUMB1 MAX	0.02010	0.00580	0.00974	0.30	OK
N: +6.00	133	COMUMB1 MIN	-0.02010	-0.00580	0.00974	0.30	OK
N: +6.00	133	COMUMB2 MAX	0.00660	0.01480	0.00901	0.28	OK
N: +6.00	133	COMUMB2 MIN	-0.00660	-0.01480	0.00901	0.28	OK
N: +2.75	133	COMUMB1 MAX	0.01090	0.00260	0.01121	0.32	OK
N: +2.75	133	COMUMB1 MIN	-0.01090	-0.00260	0.01121	0.32	OK
N: +2.75	133	COMUMB2 MAX	0.00360	0.00630	0.00726	0.20	OK
N: +2.75	133	COMUMB2 MIN	-0.00360	-0.00630	0.00726	0.20	OK
N: +0.8	133	COMUMB1 MAX	0.00000	0.00000	--	--	--
N: +0.8	133	COMUMB1 MIN	0.00000	0.00000	--	--	--
N: +0.8	133	COMUMB2 MAX	0.00000	0.00000	--	--	--
N: +0.8	133	COMUMB2 MIN	0.00000	0.00000	--	--	--
N: +6.00	134	COMUMB1 MAX	0.02000	0.00580	0.00974	0.30	OK
N: +6.00	134	COMUMB1 MIN	-0.02000	-0.00580	0.00974	0.30	OK
N: +6.00	134	COMUMB2 MAX	0.00720	0.01480	0.00912	0.28	OK
N: +6.00	134	COMUMB2 MIN	-0.00720	-0.01480	0.00912	0.28	OK



PROYECTO: I.E. EL SUR (IPIALES)

CÁLCULO DE DERIVAS MÁXIMAS (ESPECTRO DE UMBRAL DE DAÑO NSR-10)

ALTURA DE N:+9.25 3.25 m
ALTURA DE N:+6.00 3.25 m
ALTURA DE N:+2.75 3.55 m
ALTURA DE N:+0.8 0.73 m

Deriva Máxima
Permitida 0.40 %

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS FUERZA SÍSMICA Desplazamiento X	Desplazamiento Y	Deriva Δ m	Deriva Δ %	Observación
N:+2.75	134	COMUMB1 MAX	0.01080	0.00260	0.01111	0.31	OK
N:+2.75	134	COMUMB1 MIN	-0.01080	-0.00260	0.01111	0.31	OK
N:+2.75	134	COMUMB2 MAX	0.00390	0.00630	0.00741	0.21	OK
N:+2.75	134	COMUMB2 MIN	-0.00390	-0.00630	0.00741	0.21	OK
N:+0.8	134	COMUMB1 MAX	0.00000	0.00000	--	--	--
N:+0.8	134	COMUMB1 MIN	0.00000	0.00000	--	--	--
N:+0.8	134	COMUMB2 MAX	0.00000	0.00000	--	--	--
N:+0.8	134	COMUMB2 MIN	0.00000	0.00000	--	--	--
N:+9.25	135	COMUMB1 MAX	0.02480	0.00750	0.00541	0.17	OK
N:+9.25	135	COMUMB1 MIN	-0.02480	-0.00750	0.00541	0.17	OK
N:+9.25	135	COMUMB2 MAX	0.00910	0.02140	0.00745	0.23	OK
N:+9.25	135	COMUMB2 MIN	-0.00910	-0.02140	0.00745	0.23	OK
N:+6.00	135	COMUMB1 MAX	0.02000	0.00500	0.00962	0.30	OK
N:+6.00	135	COMUMB1 MIN	-0.02000	-0.00500	0.00962	0.30	OK
N:+6.00	135	COMUMB2 MAX	0.00720	0.01420	0.00875	0.27	OK
N:+6.00	135	COMUMB2 MIN	-0.00720	-0.01420	0.00875	0.27	OK
N:+2.75	135	COMUMB1 MAX	0.01080	0.00220	0.01102	0.31	OK
N:+2.75	135	COMUMB1 MIN	-0.01080	-0.00220	0.01102	0.31	OK
N:+2.75	135	COMUMB2 MAX	0.00390	0.00610	0.00724	0.20	OK
N:+2.75	135	COMUMB2 MIN	-0.00390	-0.00610	0.00724	0.20	OK
N:+0.8	135	COMUMB1 MAX	0.00000	0.00000	--	--	--
N:+0.8	135	COMUMB1 MIN	0.00000	0.00000	--	--	--
N:+0.8	135	COMUMB2 MAX	0.00000	0.00000	--	--	--
N:+0.8	135	COMUMB2 MIN	0.00000	0.00000	--	--	--
N:+9.25	136	COMUMB1 MAX	0.02500	0.00750	0.00550	0.17	OK
N:+9.25	136	COMUMB1 MIN	-0.02500	-0.00750	0.00550	0.17	OK
N:+9.25	136	COMUMB2 MAX	0.00830	0.02140	0.00740	0.23	OK
N:+9.25	136	COMUMB2 MIN	-0.00830	-0.02140	0.00740	0.23	OK
N:+6.00	136	COMUMB1 MAX	0.02010	0.00500	0.00962	0.30	OK
N:+6.00	136	COMUMB1 MIN	-0.02010	-0.00500	0.00962	0.30	OK
N:+6.00	136	COMUMB2 MAX	0.00660	0.01420	0.00864	0.27	OK
N:+6.00	136	COMUMB2 MIN	-0.00660	-0.01420	0.00864	0.27	OK
N:+2.75	136	COMUMB1 MAX	0.01090	0.00220	0.01112	0.31	OK
N:+2.75	136	COMUMB1 MIN	-0.01090	-0.00220	0.01112	0.31	OK
N:+2.75	136	COMUMB2 MAX	0.00360	0.00610	0.00708	0.20	OK
N:+2.75	136	COMUMB2 MIN	-0.00360	-0.00610	0.00708	0.20	OK
N:+0.8	136	COMUMB1 MAX	0.00000	0.00000	--	--	--
N:+0.8	136	COMUMB1 MIN	0.00000	0.00000	--	--	--
N:+0.8	136	COMUMB2 MAX	0.00000	0.00000	--	--	--
N:+0.8	136	COMUMB2 MIN	0.00000	0.00000	--	--	--
N:+9.25	137	COMUMB1 MAX	0.02500	0.00680	0.00541	0.17	OK
N:+9.25	137	COMUMB1 MIN	-0.02500	-0.00680	0.00541	0.17	OK
N:+9.25	137	COMUMB2 MAX	0.00830	0.02080	0.00701	0.22	OK
N:+9.25	137	COMUMB2 MIN	-0.00830	-0.02080	0.00701	0.22	OK
N:+6.00	137	COMUMB1 MAX	0.02010	0.00450	0.00953	0.29	OK
N:+6.00	137	COMUMB1 MIN	-0.02010	-0.00450	0.00953	0.29	OK
N:+6.00	137	COMUMB2 MAX	0.00660	0.01400	0.00854	0.26	OK
N:+6.00	137	COMUMB2 MIN	-0.00660	-0.01400	0.00854	0.26	OK
N:+2.75	137	COMUMB1 MAX	0.01090	0.00200	0.01108	0.31	OK
N:+2.75	137	COMUMB1 MIN	-0.01090	-0.00200	0.01108	0.31	OK
N:+2.75	137	COMUMB2 MAX	0.00360	0.00600	0.00700	0.20	OK
N:+2.75	137	COMUMB2 MIN	-0.00360	-0.00600	0.00700	0.20	OK
N:+0.8	137	COMUMB1 MAX	0.00000	0.00000	--	--	--
N:+0.8	137	COMUMB1 MIN	0.00000	0.00000	--	--	--
N:+0.8	137	COMUMB2 MAX	0.00000	0.00000	--	--	--
N:+0.8	137	COMUMB2 MIN	0.00000	0.00000	--	--	--



PROYECTO: I.E. EL SUR (IPIALES)

CÁLCULO DE DERIVAS MÁXIMAS (ESPECTRO DE UMBRAL DE DAÑO NSR-10)

ALTURA DE N: +9.25 3.25 m
ALTURA DE N: +6.00 3.25 m
ALTURA DE N: +2.75 3.55 m
ALTURA DE N: +0.8 0.73 m

Deriva Máxima
Permitida 0.40 %

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS FUERZA SÍSMICA Desplazamiento X	Desplazamiento Y	Deriva Δ m	Deriva Δ %	Observación
N: +9.25	138	COMUMB1 MAX	0.02480	0.00680	0.00532	0.16	OK
N: +9.25	138	COMUMB1 MIN	-0.02480	-0.00680	0.00532	0.16	OK
N: +9.25	138	COMUMB2 MAX	0.00910	0.02080	0.00706	0.22	OK
N: +9.25	138	COMUMB2 MIN	-0.00910	-0.02080	0.00706	0.22	OK
N: +6.00	138	COMUMB1 MAX	0.02000	0.00450	0.00953	0.29	OK
N: +6.00	138	COMUMB1 MIN	-0.02000	-0.00450	0.00953	0.29	OK
N: +6.00	138	COMUMB2 MAX	0.00720	0.01400	0.00865	0.27	OK
N: +6.00	138	COMUMB2 MIN	-0.00720	-0.01400	0.00865	0.27	OK
N: +2.75	138	COMUMB1 MAX	0.01080	0.00200	0.01098	0.31	OK
N: +2.75	138	COMUMB1 MIN	-0.01080	-0.00200	0.01098	0.31	OK
N: +2.75	138	COMUMB2 MAX	0.00390	0.00600	0.00716	0.20	OK
N: +2.75	138	COMUMB2 MIN	-0.00390	-0.00600	0.00716	0.20	OK
N: +0.8	138	COMUMB1 MAX	0.00000	0.00000	--	--	--
N: +0.8	138	COMUMB1 MIN	0.00000	0.00000	--	--	--
N: +0.8	138	COMUMB2 MAX	0.00000	0.00000	--	--	--
N: +0.8	138	COMUMB2 MIN	0.00000	0.00000	--	--	--
N: +9.25	139	COMUMB1 MAX	0.02500	0.00710	0.00537	0.17	OK
N: +9.25	139	COMUMB1 MIN	-0.02500	-0.00710	0.00537	0.17	OK
N: +9.25	139	COMUMB2 MAX	0.00830	0.02180	0.00691	0.21	OK
N: +9.25	139	COMUMB2 MIN	-0.00830	-0.02180	0.00691	0.21	OK
N: +6.00	139	COMUMB1 MAX	0.02010	0.00490	0.00959	0.30	OK
N: +6.00	139	COMUMB1 MIN	-0.02010	-0.00490	0.00959	0.30	OK
N: +6.00	139	COMUMB2 MAX	0.00660	0.01510	0.00892	0.27	OK
N: +6.00	139	COMUMB2 MIN	-0.00660	-0.01510	0.00892	0.27	OK
N: +2.75	139	COMUMB1 MAX	0.01090	0.00220	0.01112	0.31	OK
N: +2.75	139	COMUMB1 MIN	-0.01090	-0.00220	0.01112	0.31	OK
N: +2.75	139	COMUMB2 MAX	0.00360	0.00670	0.00761	0.21	OK
N: +2.75	139	COMUMB2 MIN	-0.00360	-0.00670	0.00761	0.21	OK
N: +0.8	139	COMUMB1 MAX	0.00000	0.00000	--	--	--
N: +0.8	139	COMUMB1 MIN	0.00000	0.00000	--	--	--
N: +0.8	139	COMUMB2 MAX	0.00000	0.00000	--	--	--
N: +0.8	139	COMUMB2 MIN	0.00000	0.00000	--	--	--
N: +9.25	140	COMUMB1 MAX	0.02480	0.00710	0.00528	0.16	OK
N: +9.25	140	COMUMB1 MIN	-0.02480	-0.00710	0.00528	0.16	OK
N: +9.25	140	COMUMB2 MAX	0.00910	0.02180	0.00696	0.21	OK
N: +9.25	140	COMUMB2 MIN	-0.00910	-0.02180	0.00696	0.21	OK
N: +6.00	140	COMUMB1 MAX	0.02000	0.00490	0.00959	0.30	OK
N: +6.00	140	COMUMB1 MIN	-0.02000	-0.00490	0.00959	0.30	OK
N: +6.00	140	COMUMB2 MAX	0.00720	0.01510	0.00902	0.28	OK
N: +6.00	140	COMUMB2 MIN	-0.00720	-0.01510	0.00902	0.28	OK
N: +2.75	140	COMUMB1 MAX	0.01080	0.00220	0.01102	0.31	OK
N: +2.75	140	COMUMB1 MIN	-0.01080	-0.00220	0.01102	0.31	OK
N: +2.75	140	COMUMB2 MAX	0.00390	0.00670	0.00775	0.22	OK
N: +2.75	140	COMUMB2 MIN	-0.00390	-0.00670	0.00775	0.22	OK
N: +0.8	140	COMUMB1 MAX	0.00000	0.00000	--	--	--
N: +0.8	140	COMUMB1 MIN	0.00000	0.00000	--	--	--
N: +0.8	140	COMUMB2 MAX	0.00000	0.00000	--	--	--
N: +0.8	140	COMUMB2 MIN	0.00000	0.00000	--	--	--
N: +9.25	141	COMUMB1 MAX	0.02500	0.00900	0.00559	0.17	OK
N: +9.25	141	COMUMB1 MIN	-0.02500	-0.00900	0.00559	0.17	OK
N: +9.25	141	COMUMB2 MAX	0.00830	0.02510	0.00769	0.24	OK
N: +9.25	141	COMUMB2 MIN	-0.00830	-0.02510	0.00769	0.24	OK
N: +6.00	141	COMUMB1 MAX	0.02010	0.00630	0.00981	0.30	OK
N: +6.00	141	COMUMB1 MIN	-0.02010	-0.00630	0.00981	0.30	OK
N: +6.00	141	COMUMB2 MAX	0.00660	0.01760	0.01006	0.31	OK
N: +6.00	141	COMUMB2 MIN	-0.00660	-0.01760	0.01006	0.31	OK



PROYECTO: I.E. EL SUR (IPIALES)

CÁLCULO DE DERIVAS MÁXIMAS (ESPECTRO DE UMBRAL DE DAÑO NSR-10)

ALTURA DE N: +9.25 3.25 m
ALTURA DE N: +6.00 3.25 m
ALTURA DE N: +2.75 3.55 m
ALTURA DE N: +0.8 0.73 m

Deriva Máxima
Permitida 0.40 %

Nivel	Punto	COMBINACIÓN DE CARGA	DESPLAZAMIENTOS FUERZA SÍSMICA		Deriva Δ m	Deriva Δ %	Observación
			Desplazamiento X	Desplazamiento Y			
N: +2.75	141	COMUMB1 MAX	0.01090	0.00290	0.01128	0.32	OK
N: +2.75	141	COMUMB1 MIN	-0.01090	-0.00290	0.01128	0.32	OK
N: +2.75	141	COMUMB2 MAX	0.00360	0.00800	0.00877	0.25	OK
N: +2.75	141	COMUMB2 MIN	-0.00360	-0.00800	0.00877	0.25	OK
N: +0.8	141	COMUMB1 MAX	0.00000	0.00000	--	--	--
N: +0.8	141	COMUMB1 MIN	0.00000	0.00000	--	--	--
N: +0.8	141	COMUMB2 MAX	0.00000	0.00000	--	--	--
N: +0.8	141	COMUMB2 MIN	0.00000	0.00000	--	--	--
N: +9.25	142	COMUMB1 MAX	0.02480	0.00900	0.00551	0.17	OK
N: +9.25	142	COMUMB1 MIN	-0.02480	-0.00900	0.00551	0.17	OK
N: +9.25	142	COMUMB2 MAX	0.00910	0.02510	0.00774	0.24	OK
N: +9.25	142	COMUMB2 MIN	-0.00910	-0.02510	0.00774	0.24	OK
N: +6.00	142	COMUMB1 MAX	0.02000	0.00630	0.00981	0.30	OK
N: +6.00	142	COMUMB1 MIN	-0.02000	-0.00630	0.00981	0.30	OK
N: +6.00	142	COMUMB2 MAX	0.00720	0.01760	0.01015	0.31	OK
N: +6.00	142	COMUMB2 MIN	-0.00720	-0.01760	0.01015	0.31	OK
N: +2.75	142	COMUMB1 MAX	0.01080	0.00290	0.01118	0.32	OK
N: +2.75	142	COMUMB1 MIN	-0.01080	-0.00290	0.01118	0.32	OK
N: +2.75	142	COMUMB2 MAX	0.00390	0.00800	0.00890	0.25	OK
N: +2.75	142	COMUMB2 MIN	-0.00390	-0.00800	0.00890	0.25	OK
N: +0.8	142	COMUMB1 MAX	0.00000	0.00000	--	--	--
N: +0.8	142	COMUMB1 MIN	0.00000	0.00000	--	--	--
N: +0.8	142	COMUMB2 MAX	0.00000	0.00000	--	--	--
N: +0.8	142	COMUMB2 MIN	0.00000	0.00000	--	--	--

PROYECTO: I.E. EL SUR (IPIALES)
VERIFICACIÓN IRREGULARIDAD TORSIONAL

Story	Point	Load	UX	UY	UZ	Δ_1	Irregularidad Torsional	Irregularidad Torsional Extrema	I.T.Extrema $\geq \Delta_1$ > I.T.?	$\Delta_1 > \text{I.T.Extrema?}$
							$1.2 * (\Delta_1 + \Delta_2) / 2$	$1.4 * (\Delta_1 + \Delta_2) / 2$		
			m	m	m	m				
N: +6.00	128	COMDER1 MAX	0.0848	0.0353	0.0005	0.0430	0.0508	0.0593	NO	NO
N: +6.00	128	COMDER1 MIN	-0.0848	-0.0353	-0.0005	0.0430	0.0508	0.0593	NO	NO
N: +6.00	128	COMDER2 MAX	0.028	0.0897	0.0007	0.0496	0.0532	0.0621	NO	NO
N: +6.00	128	COMDER2 MIN	-0.028	-0.0897	-0.0007	0.0496	0.0532	0.0621	NO	NO
N: +2.75	128	COMDER1 MAX	0.046	0.0168	0.0004	0.0490	0.0580	0.0676	NO	NO
N: +2.75	128	COMDER1 MIN	-0.046	-0.0168	-0.0004	0.0490	0.0580	0.0676	NO	NO
N: +2.75	128	COMDER2 MAX	0.0151	0.0418	0.0005	0.0444	0.0456	0.0533	NO	NO
N: +2.75	128	COMDER2 MIN	-0.0151	-0.0418	-0.0005	0.0444	0.0456	0.0533	NO	NO
BASE	128	COMDER1 MAX	0	0	0					
BASE	128	COMDER1 MIN	0	0	0					
BASE	128	COMDER2 MAX	0	0	0					
BASE	128	COMDER2 MIN	0	0	0					

Story	Point	Load	UX	UY	UZ	Δ_1	Irregularidad Torsional	Irregularidad Torsional Extrema	I.T.Extrema $\geq \Delta_1$ > I.T.?	$\Delta_1 > \text{I.T.Extrema?}$
							$1.2 * (\Delta_1 + \Delta_2) / 2$	$1.4 * (\Delta_1 + \Delta_2) / 2$		
			m	m	m	m				
N: +6.00	131	COMDER1 MAX	0.0848	0.0277	0.0004	0.0417	0.0499	0.0582	NO	NO
N: +6.00	131	COMDER1 MIN	-0.0848	-0.0277	-0.0004	0.0417	0.0499	0.0582	NO	NO
N: +6.00	131	COMDER2 MAX	0.028	0.0647	0.0005	0.0391	0.0472	0.0550	NO	NO
N: +6.00	131	COMDER2 MIN	-0.028	-0.0647	-0.0005	0.0391	0.0472	0.0550	NO	NO
N: +2.75	131	COMDER1 MAX	0.046	0.0125	0.0003	0.0477	0.0570	0.0665	NO	NO
N: +2.75	131	COMDER1 MIN	-0.046	-0.0125	-0.0003	0.0477	0.0570	0.0665	NO	NO
N: +2.75	131	COMDER2 MAX	0.0151	0.0278	0.0004	0.0316	0.0383	0.0447	NO	NO
N: +2.75	131	COMDER2 MIN	-0.0151	-0.0278	-0.0004	0.0316	0.0383	0.0447	NO	NO
N: +0.8	131	COMDER1 MAX	0	0	0					
N: +0.8	131	COMDER1 MIN	0	0	0					
N: +0.8	131	COMDER2 MAX	0	0	0					
N: +0.8	131	COMDER2 MIN	0	0	0					

Story	Point	Load	UX	UY	UZ	Δ_1	Irregularidad Torsional	Irregularidad Torsional Extrema	I.T.Extrema $\geq \Delta_1$ > I.T.?	$\Delta_1 > \text{I.T.Extrema?}$
							$1.2 * (\Delta_1 + \Delta_2) / 2$	$1.4 * (\Delta_1 + \Delta_2) / 2$		
			m	m	m	m				
N: +6.00	132	COMDER1 MAX	0.0843	0.0277	0.0004	0.0415	0.0506	0.0590	NO	NO
N: +6.00	132	COMDER1 MIN	-0.0843	-0.0277	-0.0004	0.0415	0.0506	0.0590	NO	NO
N: +6.00	132	COMDER2 MAX	0.0305	0.0647	0.0005	0.0395	0.0537	0.0626	NO	NO
N: +6.00	132	COMDER2 MIN	-0.0305	-0.0647	-0.0005	0.0395	0.0537	0.0626	NO	NO
N: +2.75	132	COMDER1 MAX	0.0457	0.0125	0.0003	0.0474	0.0576	0.0672	NO	NO
N: +2.75	132	COMDER1 MIN	-0.0457	-0.0125	-0.0003	0.0474	0.0576	0.0672	NO	NO
N: +2.75	132	COMDER2 MAX	0.0164	0.0278	0.0004	0.0323	0.0463	0.0540	NO	NO
N: +2.75	132	COMDER2 MIN	-0.0164	-0.0278	-0.0004	0.0323	0.0463	0.0540	NO	NO
N: +0.8	132	COMDER1 MAX	0	0	0					
N: +0.8	132	COMDER1 MIN	0	0	0					
N: +0.8	132	COMDER2 MAX	0	0	0					
N: +0.8	132	COMDER2 MIN	0	0	0					

Story	Point	Load	UX	UY	UZ	Δ_1	Irregularidad Torsional	Irregularidad Torsional Extrema	I.T.Extrema $\geq \Delta_1$ > I.T.?	$\Delta_1 > \text{I.T.Extrema?}$
							$1.2 * (\Delta_1 + \Delta_2) / 2$	$1.4 * (\Delta_1 + \Delta_2) / 2$		
			m	m	m	m				
N: +6.00	129	COMDER1 MAX	0.0843	0.0353	0.0005	0.0428	0.0515	0.0601	NO	NO
N: +6.00	129	COMDER1 MIN	-0.0843	-0.0353	-0.0005	0.0428	0.0515	0.0601	NO	NO

N: +6.00	129	COMDER2 MAX	0.0305	0.0897	0.0007	0.0499	0.0597	0.0697	NO	NO
N: +6.00	129	COMDER2 MIN	-0.0305	-0.0897	-0.0007	0.0499	0.0597	0.0697	NO	NO
N: +2.75	129	COMDER1 MAX	0.0457	0.0168	0.0004	0.0487	0.0586	0.0684	NO	NO
N: +2.75	129	COMDER1 MIN	-0.0457	-0.0168	-0.0004	0.0487	0.0586	0.0684	NO	NO
N: +2.75	129	COMDER2 MAX	0.0164	0.0418	0.0005	0.0449	0.0536	0.0625	NO	NO
N: +2.75	129	COMDER2 MIN	-0.0164	-0.0418	-0.0005	0.0449	0.0536	0.0625	NO	NO
BASE	129	COMDER1 MAX	0	0	0					
BASE	129	COMDER1 MIN	0	0	0					
BASE	129	COMDER2 MAX	0	0	0					
BASE	129	COMDER2 MIN	0	0	0					

PROYECTO: I.E. EL SUR (IPIALES)
VERIFICACIÓN DE ÍNDICE DE ESTABILIDAD Qi

DESPLAZAMIENTO DE DIAFRAGMAS RIGIDOS

NIVEL	Diaphragm	COMBINACIÓN	DESPLAZAMIENTOS FUERZA SÍSMICA		Deriva Δ
		DE CARGA	Desplazamiento X	Desplazamiento Y	m
N:+9.25	D1	COMDER1 MAX	0.1037	0.0282	0.023
N:+9.25	D1	COMDER1 MIN	-0.1037	-0.0282	0.023
N:+9.25	D1	COMDER2 MAX	0.0323	0.0888	0.031
N:+9.25	D1	COMDER2 MIN	-0.0323	-0.0888	0.031
N:+6.00	D1	COMDER1 MAX	0.0835	0.018	0.039
N:+6.00	D1	COMDER1 MIN	-0.0835	-0.018	0.039
N:+6.00	D1	COMDER2 MAX	0.026	0.058	0.035
N:+6.00	D1	COMDER2 MIN	-0.026	-0.058	0.035
N:+2.75	D1	COMDER1 MAX	0.0454	0.0078	0.046
N:+2.75	D1	COMDER1 MIN	-0.0454	-0.0078	0.046
N:+2.75	D1	COMDER2 MAX	0.0141	0.0251	0.029
N:+2.75	D1	COMDER2 MIN	-0.0141	-0.0251	0.029

FUERZA CORTANTE DEL PISO i

PISO	Fx	Vi
	kN	kN
N:+9.25	113.5	113.53
N:+6.00	295.0	408.51
N:+2.75	265.0	673.47

CÁLCULO DE CARGA MUERTA POR NIVEL

NIVEL	Área	Carga Muerta kN	Acumulado Carga Muerta	Carga Viva kN/m ²	Carga Viva kN	Acumulado Carga Viva	Sumatoria de Cargas
N:+9.25	313.84	89.42	89.42	0.62	194.83	194.83	284.26
N:+6.00	438.80	299.55	299.55	4.45	1954.54	1954.54	2254.09
N:+2.75	544.70	430.37	430.37	4.45	2426.25	2426.25	2856.62

ÍNDICE DE ESTABILIDAD

$$Q_i = \frac{P_i \Delta_{cm}}{V_i H_{pi}}$$

Donde:

- Pi** Suma de la carga vertical total, incluyendo muerta y viva, que existe en el piso i, y todos los pisos localizados por encima. Para el cálculo de los efectos P-Delta, no hay necesidad que los coeficientes de carga sean mayores que la unidad.
- Δ_{cm}** Deriva del piso i, en la dirección bajo estudio, medida en el centro de masa del piso, como la diferencia entre el desplazamiento horizontal del piso i menos el del piso i-1.
- Vi** Fuerza cortante del piso, en la dirección bajo estudio, sin dividir por **R**. Se determina por medio de la ecuación A.3-2. Corresponde a la suma de las fuerzas horizontales sísmicas que se aplican en el nivel i, y todos los niveles localizados por encima de él.
- Hpi** Altura del piso i, medida desde la superficie del diafragma del piso i hasta la superficie del diafragma del piso inmediatamente inferior i-1.

PROYECTO: I.E. EL SUR (IPIALES)
VERIFICACIÓN DE INDICE DE ESTABILIDAD Qi

DESPLAZAMIENTO DE DIAFRAGMAS RIGIDOS
VERIFICACIÓN DE ESTABILIDAD

$$Q_i(x) = \frac{P_i \Delta c_m}{V_i H_{pi}}$$

NIVEL	COMBINACIÓN	H _{pi}	P _i	Δc _m	V _i	Q _i	ESTABILIDAD
	DE CARGA	m	kN	m	kN		Q _i <0.10
N:+9.25	COMDER1 MAX	3.25	284.257	0.023	113.530	0.0174	ESTABLE
N:+9.25	COMDER1 MIN	3.25	284.257	0.023	113.530	0.0174	ESTABLE
N:+9.25	COMDER2 MAX	3.25	284.257	0.031	113.530	0.0242	ESTABLE
N:+9.25	COMDER2 MIN	3.25	284.257	0.031	113.530	0.0242	ESTABLE
N:+6.00	COMDER1 MAX	3.25	2254.087	0.039	408.510	0.0670	ESTABLE
N:+6.00	COMDER1 MIN	3.25	2254.087	0.039	408.510	0.0670	ESTABLE
N:+6.00	COMDER2 MAX	3.25	2254.087	0.035	408.510	0.0594	ESTABLE
N:+6.00	COMDER2 MIN	3.25	2254.087	0.035	408.510	0.0594	ESTABLE
N:+2.75	COMDER1 MAX	3.55	2856.621	0.046	673.470	0.0550	ESTABLE
N:+2.75	COMDER1 MIN	3.55	2856.621	0.046	673.470	0.0550	ESTABLE
N:+2.75	COMDER2 MAX	3.55	2856.621	0.029	673.470	0.0344	ESTABLE
N:+2.75	COMDER2 MIN	3.55	2856.621	0.029	673.470	0.0344	ESTABLE

4. DISEÑO DE CIMENTACIÓN

DISEÑO DE CIMENTACIÓN

PROYECTO: I.E. EL SUR (IPIALES)

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

Combinaciones de carga

Cargas Gravitacionales:

CIMEN= 1D + 1L

NSR-10

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)I

B.2.3-8

CIMEN3= 1D + 0.75L + 0.21*(0.75/R)Ex + 0.70*(0.75/R)I

Story	Point	Load	FX	FY	FZ	MX	MY	MZ	Load	Max	COMBINACIÓN	Pumax
										(Mx:My)		
N:+0.8	131	CIMEN1	21.90	-8.86	629.82	44.15	26.03	-0.07	CIMEN1	44.15		
N:+0.8	131	CIMEN2 MAX	66.70	11.26	633.56	95.82	128.27	0.58	CIMEN2 MAX	128.27		
N:+0.8	131	CIMEN2 MIN	-26.56	-30.41	547.05	-12.77	-80.53	-0.72	CIMEN2 MIN	80.53	CIMEN1	629.82
N:+0.8	131	CIMEN3 MAX	35.54	33.39	643.12	158.04	58.36	1.17	CIMEN3 MAX	158.04		
N:+0.8	131	CIMEN3 MIN	4.60	-52.54	537.49	-74.99	-10.63	-1.31	CIMEN3 MIN	74.99		
N:+0.8	132	CIMEN1	8.92	8.10	422.98	24.90	10.65	-0.07	CIMEN1	24.90		
N:+0.8	132	CIMEN2 MAX	51.40	29.76	445.03	74.56	109.92	0.58	CIMEN2 MAX	109.92		
N:+0.8	132	CIMEN2 MIN	-33.40	-11.68	358.22	-33.75	-88.45	-0.72	CIMEN2 MIN	88.45	CIMEN1	422.98
N:+0.8	132	CIMEN3 MAX	24.28	51.12	454.99	135.89	46.37	1.17	CIMEN3 MAX	135.89		
N:+0.8	132	CIMEN3 MIN	-6.28	-33.04	348.25	-95.08	-24.90	-1.31	CIMEN3 MIN	95.08		
N:+0.8	133	CIMEN1	18.41	-5.69	863.33	41.31	21.97	-0.07	CIMEN1	41.31		
N:+0.8	133	CIMEN2 MAX	71.32	9.50	833.06	86.80	133.65	0.58	CIMEN2 MAX	133.65		
N:+0.8	133	CIMEN2 MIN	-37.63	-25.05	774.43	-6.42	-93.41	-0.72	CIMEN2 MIN	93.41	CIMEN1	863.33
N:+0.8	133	CIMEN3 MAX	34.88	32.18	848.92	150.80	57.60	1.17	CIMEN3 MAX	150.80		
N:+0.8	133	CIMEN3 MIN	-1.19	-47.73	758.57	-70.41	-17.36	-1.31	CIMEN3 MIN	70.41		
N:+0.8	134	CIMEN1	19.59	22.46	562.14	9.37	23.05	-0.07	CIMEN1	23.05		
N:+0.8	134	CIMEN2 MAX	67.37	39.57	554.65	52.02	128.49	0.58	CIMEN2 MAX	128.49		
N:+0.8	134	CIMEN2 MIN	-30.92	5.60	510.64	-40.53	-85.58	-0.72	CIMEN2 MIN	85.58	CIMEN1	562.14
N:+0.8	134	CIMEN3 MAX	35.91	61.60	575.22	115.26	59.89	1.17	CIMEN3 MAX	115.26		
N:+0.8	134	CIMEN3 MIN	0.55	-16.43	490.07	-103.77	-16.98	-1.31	CIMEN3 MIN	103.77		
N:+0.8	135	CIMEN1	-24.18	21.72	613.53	11.13	-27.80	-0.07	CIMEN1	27.80		
N:+0.8	135	CIMEN2 MAX	27.91	36.18	636.97	47.82	82.66	0.58	CIMEN2 MAX	82.66		
N:+0.8	135	CIMEN2 MIN	-74.02	6.39	537.95	-31.64	-135.67	-0.72	CIMEN2 MIN	135.67	CIMEN1	613.53
N:+0.8	135	CIMEN3 MAX	-4.80	60.67	655.23	115.85	12.61	1.17	CIMEN3 MAX	115.85		
N:+0.8	135	CIMEN3 MIN	-41.32	-18.10	519.69	-99.67	-65.62	-1.31	CIMEN3 MIN	99.67		
N:+0.8	136	CIMEN1	-36.73	-23.19	1052.18	110.24	-41.89	-0.11	CIMEN1	110.24		
N:+0.8	136	CIMEN2 MAX	35.40	5.31	1039.08	186.48	108.86	0.91	CIMEN2 MAX	186.48		
N:+0.8	136	CIMEN2 MIN	-102.59	-51.04	930.06	16.51	-185.43	-1.12	CIMEN2 MIN	185.43	CIMEN1	1052.18
N:+0.8	136	CIMEN3 MAX	-10.80	51.15	1053.50	332.11	10.23	1.83	CIMEN3 MAX	332.11		
N:+0.8	136	CIMEN3 MIN	-56.39	-96.88	915.64	-129.12	-86.81	-2.04	CIMEN3 MIN	129.12		
N:+0.8	137	CIMEN1	31.37	-22.00	1333.43	110.32	37.22	-0.11	CIMEN1	110.32		
N:+0.8	137	CIMEN2 MAX	98.41	2.98	1291.42	175.76	182.05	0.91	CIMEN2 MAX	182.05		
N:+0.8	137	CIMEN2 MIN	-40.79	-45.41	1187.87	26.23	-113.64	-1.12	CIMEN2 MIN	113.64	CIMEN1	1333.43
N:+0.8	137	CIMEN3 MAX	51.86	51.65	1311.81	327.92	83.03	1.83	CIMEN3 MAX	327.92		
N:+0.8	137	CIMEN3 MIN	5.75	-94.09	1167.48	-125.93	-14.62	-2.04	CIMEN3 MIN	125.93		
N:+0.8	138	CIMEN1	21.54	11.47	819.18	73.61	25.41	-0.11	CIMEN1	73.61		
N:+0.8	138	CIMEN2 MAX	83.63	36.12	825.47	139.06	164.13	0.91	CIMEN2 MAX	164.13		
N:+0.8	138	CIMEN2 MIN	-42.49	-11.96	740.24	-10.12	-115.59	-1.12	CIMEN2 MIN	115.59	CIMEN1	819.18
N:+0.8	138	CIMEN3 MAX	43.24	84.46	852.15	290.86	74.47	1.83	CIMEN3 MAX	290.86		
N:+0.8	138	CIMEN3 MIN	-2.09	-60.30	713.56	-161.91	-25.93	-2.04	CIMEN3 MIN	161.91		
N:+0.8	139	CIMEN1	0.31	-25.10	1557.23	152.79	1.24	-0.13	CIMEN1	152.79		
N:+0.8	139	CIMEN2 MAX	71.77	13.47	1467.68	257.75	159.57	1.08	CIMEN2 MAX	257.75		
N:+0.8	139	CIMEN2 MIN	-71.11	-62.30	1424.40	21.86	-157.14	-1.32	CIMEN2 MIN	157.14	CIMEN1	1557.23
N:+0.8	139	CIMEN3 MAX	24.03	86.94	1510.40	491.76	53.54	2.16	CIMEN3 MAX	491.76		
N:+0.8	139	CIMEN3 MIN	-23.37	-135.77	1381.68	-212.15	-51.11	-2.41	CIMEN3 MIN	212.15		
N:+0.8	140	CIMEN1	0.57	10.29	873.29	114.77	1.10	-0.13	CIMEN1	114.77		
N:+0.8	140	CIMEN2 MAX	65.64	48.87	860.22	219.16	151.59	1.08	CIMEN2 MAX	219.16		
N:+0.8	140	CIMEN2 MIN	-64.64	-26.36	819.38	-16.15	-149.58	-1.32	CIMEN2 MIN	149.58	CIMEN1	873.29
N:+0.8	140	CIMEN3 MAX	23.94	121.83	903.88	452.62	55.08	2.16	CIMEN3 MAX	452.62		
N:+0.8	140	CIMEN3 MIN	-22.93	-99.32	775.73	-249.61	-53.07	-2.41	CIMEN3 MIN	249.61		
N:+0.8	141	CIMEN1	-27.88	-8.43	1347.57	99.78	-31.61	-0.11	CIMEN1	99.78		
N:+0.8	141	CIMEN2 MAX	43.00	30.63	1303.26	206.80	117.64	0.91	CIMEN2 MAX	206.80		
N:+0.8	141	CIMEN2 MIN	-94.89	-48.08	1190.70	-24.04	-176.44	-1.12	CIMEN2 MIN	176.44	CIMEN1	1347.57
N:+0.8	141	CIMEN3 MAX	-3.54	95.17	1325.28	401.25	18.52	1.83	CIMEN3 MAX	401.25		
N:+0.8	141	CIMEN3 MIN	-48.35	-112.62	1168.68	-218.49	-77.32	-2.04	CIMEN3 MIN	218.49		
N:+0.8	142	CIMEN1	-28.82	-3.09	548.80	93.92	-33.09	-0.11	CIMEN1	93.92		
N:+0.8	142	CIMEN2 MAX	36.06	37.59	582.51	198.60	108.86	0.91	CIMEN2 MAX	198.60		
N:+0.8	142	CIMEN2 MIN	-91.03	-40.60	484.72	-31.66	-171.97	-1.12	CIMEN2 MIN	171.97	CIMEN1	548.80
N:+0.8	142	CIMEN3 MAX	-5.05	101.62	611.13	392.50	18.36	1.83	CIMEN3 MAX	392.50		
N:+0.8	142	CIMEN3 MIN	-49.92	-104.64	456.10	-225.56	-81.47	-2.04	CIMEN3 MIN	225.56		
BASE	127	CIMEN1	15.11	3.47	959.78	21.88	21.66	-0.06	CIMEN1	21.88		

PROYECTO: I.E. EL SUR (IPIALES)

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

BASE	127	CIMEN2 MAX	48.07	14.57	935.74	62.68	102.58	0.48	CIMEN2 MAX	102.58		
BASE	127	CIMEN2 MIN	-19.92	-10.47	846.04	-20.10	-62.20	-0.60	CIMEN2 MIN	62.20	CIMEN1	959.78
BASE	127	CIMEN3 MAX	25.66	32.72	959.78	126.24	47.84	0.97	CIMEN3 MAX	126.24		
BASE	127	CIMEN3 MIN	2.50	-28.62	822.00	-83.67	-7.45	-1.09	CIMEN3 MIN	83.67		
BASE	128	CIMEN1	-21.15	-8.51	599.67	38.99	-29.36	-0.06	CIMEN1	38.99		
BASE	128	CIMEN2 MAX	6.50	6.37	607.60	86.99	44.09	0.48	CIMEN2 MAX	86.99		
BASE	128	CIMEN2 MIN	-45.24	-24.52	519.41	-12.62	-97.84	-0.60	CIMEN2 MIN	97.84	CIMEN1	599.67
BASE	128	CIMEN3 MAX	-10.70	27.86	627.79	158.78	-3.31	0.97	CIMEN3 MAX	158.78		
BASE	128	CIMEN3 MIN	-28.04	-46.01	499.22	-84.41	-50.45	-1.09	CIMEN3 MIN	84.41		
BASE	129	CIMEN1	-15.52	16.45	306.74	4.42	-21.64	-0.06	CIMEN1	21.64		
BASE	129	CIMEN2 MAX	8.74	31.65	340.99	52.40	46.82	0.48	CIMEN2 MAX	52.40		
BASE	129	CIMEN2 MIN	-38.24	0.44	254.57	-47.62	-87.95	-0.60	CIMEN2 MIN	87.95	CIMEN1	306.74
BASE	129	CIMEN3 MAX	-6.25	52.29	361.56	123.01	3.68	0.97	CIMEN3 MAX	123.01		
BASE	129	CIMEN3 MIN	-23.25	-20.20	234.00	-118.23	-44.82	-1.09	CIMEN3 MIN	118.23		
BASE	130	CIMEN1	16.57	10.90	307.80	11.59	23.52	-0.06	CIMEN1	23.52		
BASE	130	CIMEN2 MAX	46.71	23.13	352.95	50.22	100.26	0.48	CIMEN2 MAX	100.26		
BASE	130	CIMEN2 MIN	-15.17	-1.47	253.08	-31.96	-55.49	-0.60	CIMEN2 MIN	55.49	CIMEN1	307.80
BASE	130	CIMEN3 MAX	27.13	41.35	371.78	113.88	50.68	0.97	CIMEN3 MAX	113.88		
BASE	130	CIMEN3 MIN	4.41	-19.68	234.26	-95.61	-5.91	-1.09	CIMEN3 MIN	95.61		

DISEÑO VIGAS DE AMARRE

PROYECTO: I.E. EL SUR (IPIALES)

VIGA DE AMARRE TIPO

$$f'c = \boxed{21.1} \text{ MPa}$$

$$f_y = \boxed{420} \text{ MPa}$$

$$b = \boxed{0.40} \text{ m}$$

$$h = \boxed{0.50} \text{ m}$$

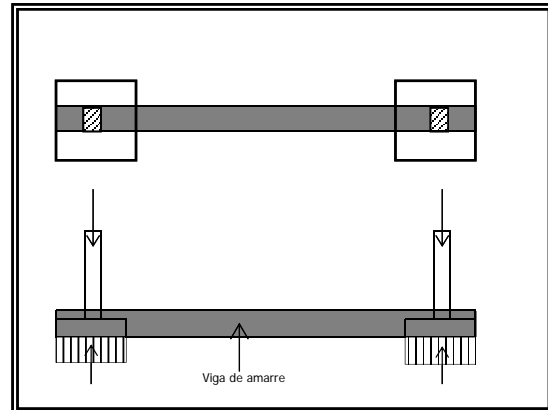
$$P_{\text{máx}} = 1557.23 \text{ kN}$$

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

$$A_a = 0.25$$

$$P_{\text{axial}} = 0.25 * A_a * P_{\text{máx}}$$

$$P_{\text{axial}} = 97.3 \text{ kN}$$



DISEÑO A TENSIÓN

$$A_s = 1.7 * 97.326875 / (0.90 * 420)$$

$$A_s = \boxed{4.38} \text{ cm}^2$$

DISEÑO A COMPRESIÓN

$$P_{\text{com}} = 1.7 * 97.326875$$

$$P_{\text{com}} = 165.5 \text{ kN}$$

Para esta carga la sección requiere cuantía mínima:

$$A_s = 0.00333 * 0.4 * 0.45$$

$$A_s = \boxed{5.99} \text{ cm}^2$$

Se suministra un refuerzo constituido por 4#5 arriba y 4#4 abajo (como refuerzo mínimo).

DISEÑO DE ZAPATAS CONCÉNTRICAS
PROYECTO: I.E. EL SUR (IPIALES)

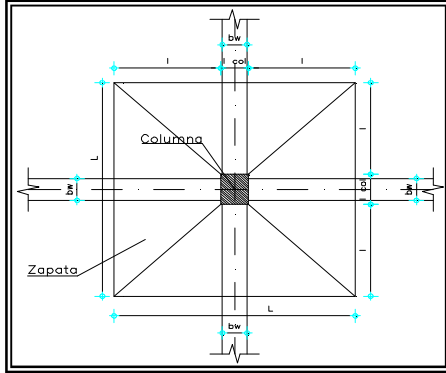
ZAPATA TIPO 1 (3 Und).

Columna **b = 40** cm
t = 60 cm

f'c = 21.0 MPa
fy = 420.0 MPa

σ = 0.145 MPa

PREDIMENSIONAMIENTO



L = 2.000 m
lcol = 0.600 m
l = 0.700 m

Cargas
Mu = 0 kN*m
Pu = 423.0 kN
Pp (10%) = 42 kN
Σ P = 465 kN

$$\text{Area necesaria} = \frac{\Sigma P}{\sigma} = \frac{465.28}{0.145} = 3.21 \text{ m}^2$$

e = 0.00 m
L = 1.791 m **Aproximamos = 2.00** m

$$\text{Carga de diseño} = \frac{Pu}{A \text{ real}} = \frac{422.98}{4.000} = 0.106 \text{ MPa}$$

Esfuerzos
σmáx = 0.116 MPa **OK**
σmin = 0.116 MPa **OK**

DISEÑO DE ZAPATA CONCÉNTRICA

FLEXIÓN

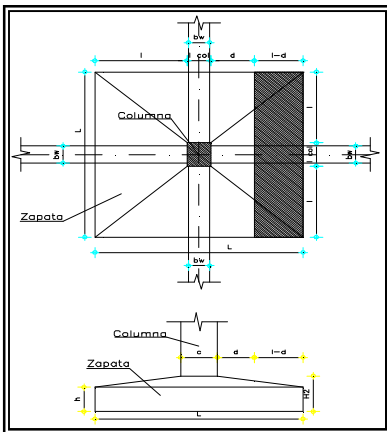
Mu = M borde de la columna = 28.50 kN*m
1,7 * M borde de la columna = 48.45 kN*m

Con el criterio de calcular el refuerzo por metro lineal utilizamos una altura efectiva igual a:

d = 0.23 m
Cuantia = 0.00224
As = 5.15 cm²/m

Armadura: 11#423 c./0.20 m en ambos sentidos

CORTANTE



a. En una dirección (d)

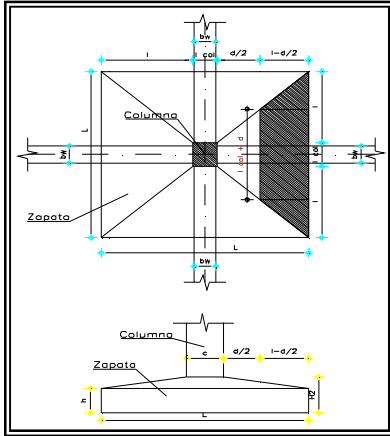
L = 2.00 m
l = 0.70 m
l - d = 0.47 m

H = 0.30 m
h = 0.30 m
H-h = 0.00 m

V (d) = 109.34 kN
Vu (d) = 1.7*V(d)
Vu (d) = 185.88 kN
h' = 0.23 m

$$v_v = \frac{Vu}{L * h'} = 0.404 \text{ MPa}$$

φvc = 0.573 MPa **OK**



b. En dos direcciones (d/2)

$$\begin{aligned} L &= 2.000 \text{ m} \\ d/2 &= 0.115 \text{ m} \\ l - d/2 &= 0.585 \text{ m} \end{aligned}$$

ZAPATA TIPO 1 (3 Und).

$$\begin{aligned} H &= 0.30 \text{ m} \\ h &= 0.30 \text{ m} \\ H-h &= 0.00 \text{ m} \end{aligned}$$

$$\begin{aligned} V(d/2) &= 96.3 \text{ kN} \\ Vu(d/2) &= 1.5 \cdot V(d) \\ Vu(d/2) &= 144.4 \text{ kN} \\ d_1 &= 0.23 \text{ m} \end{aligned}$$

$$vu = \frac{Vu}{bo \times d_1} = 0.757 \text{ MPa}$$

$$\phi_{vc} = 1.15 \text{ MPa OK}$$

DISEÑO DE ZAPATAS CONCENTRICAS
PROYECTO: I.E. EL SUR (IPIALES)

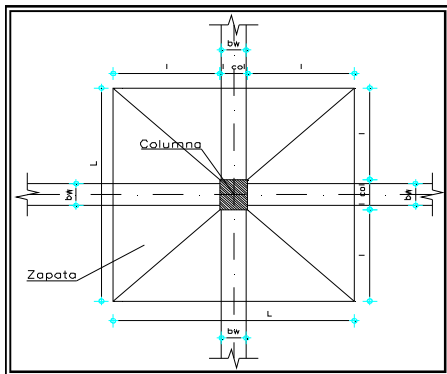
ZAPATA TIPO 2 (5 Und).

$$\begin{aligned} \text{Columna } b &= 40 \text{ cm} \\ t &= 60 \text{ cm} \end{aligned}$$

$$\begin{aligned} f_c &= 21.0 \text{ MPa} \\ f_y &= 420.0 \text{ MPa} \end{aligned}$$

$$\sigma = 0.145 \text{ MPa}$$

PREDIMENSIONAMIENTO



$$\begin{aligned} L &= 2.400 \text{ m} \\ l_{col} &= 0.600 \text{ m} \\ l &= 0.900 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{Cargas} \\ Mu &= 0 \text{ kN}\cdot\text{m} \\ Pu &= 629.8 \text{ kN} \\ Pp(10\%) &= 63 \text{ kN} \\ \Sigma P &= 693 \text{ kN} \end{aligned}$$

$$\text{Area necesaria} = \frac{\Sigma P}{\sigma} = \frac{692.80}{0.145} = 4.78 \text{ m}^2$$

$$\begin{aligned} e &= 0.00 \text{ m} \\ L &= 2.186 \text{ m} \end{aligned} \quad \text{Aproximamos} = 2.40 \text{ m}$$

$$\text{Carga de diseño} = \frac{Pu}{A_{real}} = \frac{629.82}{5.760} = 0.109 \text{ MPa}$$

$$\begin{aligned} \text{Esfuerzos} \\ \sigma_{\max} &= 0.120 \text{ MPa OK} \\ \sigma_{\min} &= 0.120 \text{ MPa OK} \end{aligned}$$

DISEÑO DE ZAPATA CONCENTRICA

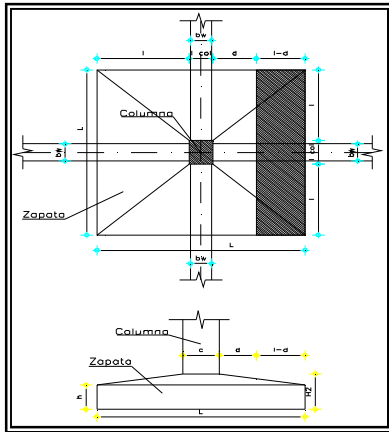
FLEXIÓN

$$\begin{aligned} M \text{ borde de la columna} &= 48.71 \text{ kN}\cdot\text{m} \\ Mu &= 1.7 \cdot M \text{ borde de la columna} = 82.81 \text{ kN}\cdot\text{m} \end{aligned}$$

Con el criterio de calcular el refuerzo por metro lineal utilizamos una altura efectiva igual a:

$$\begin{aligned} d &= 0.33 \text{ m} \\ \text{Cuantia} &= 0.00200 \\ As &= 6.60 \text{ cm}^2/\text{m} \end{aligned}$$

CORTANTE



Armadura: 14#427 c./0.19 m en ambos sentidos

a. En una dirección (d)

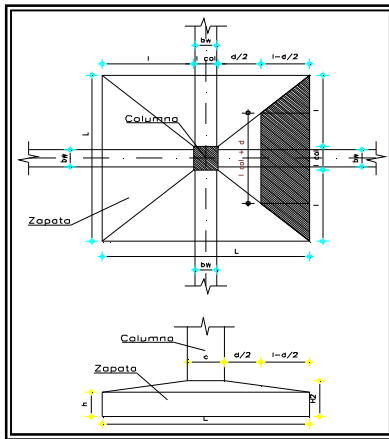
$$\begin{aligned} L &= 2.40 \text{ m} \\ l &= 0.90 \text{ m} \\ l - d &= 0.57 \text{ m} \end{aligned}$$

$$\begin{aligned} H &= 0.40 \text{ m} \\ h &= 0.30 \text{ m} \\ H - h &= 0.10 \text{ m} \end{aligned}$$

$$\begin{aligned} V(d) &= 164.54 \text{ kN} \\ V_u(d) &= 1.7 \cdot V(d) \\ V_u(d) &= 279.72 \text{ kN} \\ h' &= 0.30 \text{ m} \end{aligned}$$

$$v_v = \frac{V_u}{L \cdot h'} = 0.392 \text{ MPa}$$

$$\phi_{vc} = 0.573 \text{ MPa OK}$$



b. En dos direcciones (d/2)

ZAPATA TIPO 2 (5 Und).

$$\begin{aligned} L &= 2.400 \text{ m} \\ d/2 &= 0.165 \text{ m} \\ l - d/2 &= 0.735 \text{ m} \end{aligned}$$

$$\begin{aligned} H &= 0.40 \text{ m} \\ h &= 0.30 \text{ m} \\ H - h &= 0.10 \text{ m} \end{aligned}$$

$$\begin{aligned} V(d/2) &= 147.2 \text{ kN} \\ V_u(d/2) &= 1.5 \cdot V(d/2) \\ V_u(d/2) &= 220.8 \text{ kN} \\ d_1 &= 0.31647059 \text{ m} \end{aligned}$$

$$v_u = \frac{V_u}{b_o \times d_1} = 0.750 \text{ MPa}$$

$$\phi_{vc} = 1.15 \text{ MPa OK}$$

DISEÑO DE ZAPATAS CONCENTRICAS PROYECTO: I.E. EL SUR (IPIALES)

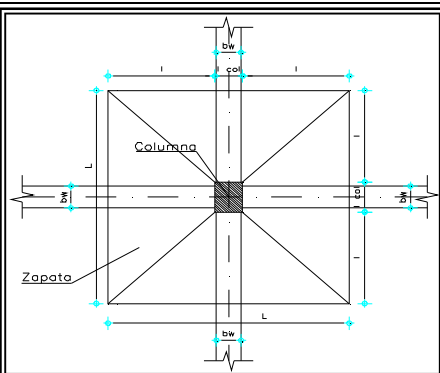
ZAPATA TIPO 3 (4 Und).

$$\begin{aligned} \text{Columna } b &= 40 \text{ cm} \\ t &= 60 \text{ cm} \end{aligned}$$

$$\begin{aligned} f_c &= 21.0 \text{ MPa} \\ f_y &= 420.0 \text{ MPa} \end{aligned}$$

$$\sigma = 0.145 \text{ MPa}$$

PREDIMENSIONAMIENTO



$$\begin{aligned} L &= 2.700 \text{ m} \\ l_{col} &= 0.600 \text{ m} \\ l &= 1.050 \text{ m} \end{aligned}$$

Cargas	
Mu	= 0 kN*m
Pu	= 959.8 kN
Pp (10%)	= 96 kN
Σ P	= 1056 kN

$$\text{Area necesaria} = \frac{\Sigma P}{\sigma} = \frac{1055.76}{0.145} = 7.28 \text{ m}^2$$

$$\begin{aligned} e &= 0.00 \text{ m} \\ L &= 2.698 \text{ m} \end{aligned}$$

$$\text{Aproximamos} = 2.70 \text{ m}$$

$$\text{Carga de diseño} = \frac{P_u}{A_{\text{real}}} = \frac{959.78}{7.290} = 0.132 \text{ MPa}$$

Esfuerzos			
$\sigma_{\max} =$	0.145	MPa	OK
$\sigma_{\min} =$	0.145	MPa	OK

DISEÑO DE ZAPATA CONCENTRICA

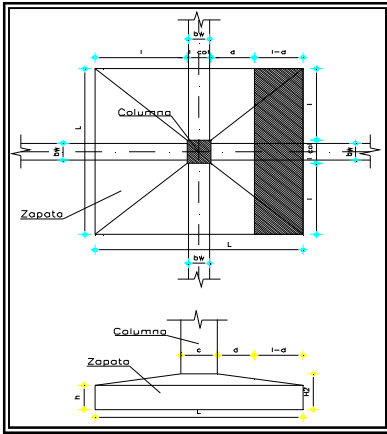
FLEXIÓN

$$\begin{aligned} M \text{ borde de la columna} &= 79.83 \text{ kN}\cdot\text{m} \\ Mu &= 1.7 * M \text{ borde de la columna} = 135.72 \text{ kN}\cdot\text{m} \end{aligned}$$

Con el criterio de calcular el refuerzo por metro lineal utilizamos una altura efectiva igual a:

$$\begin{aligned} d &= 0.43 \text{ m} \\ \text{Cuantia} &= 0.00200 \\ As &= 8.60 \text{ cm}^2/\text{m} \\ \text{Armadura: } &19\#430 \text{ c./0.15 m en} \\ &\text{ambos sentidos} \end{aligned}$$

CORTANTE



a. En una dirección (d)

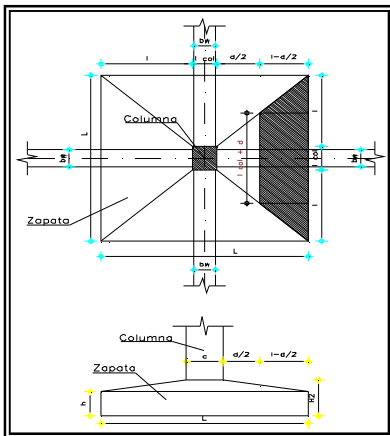
$$\begin{aligned} L &= 2.70 \text{ m} \\ l &= 1.05 \text{ m} \\ l - d &= 0.62 \text{ m} \end{aligned}$$

$$\begin{aligned} H &= 0.50 \text{ m} \\ h &= 0.30 \text{ m} \\ H - h &= 0.20 \text{ m} \end{aligned}$$

$$\begin{aligned} V(d) &= 242.43 \text{ kN} \\ Vu(d) &= 1.7 * V(d) \\ Vu(d) &= 412.14 \text{ kN} \\ h' &= 0.35 \text{ m} \end{aligned}$$

$$v_v = \frac{Vu}{L * h'} = 0.431 \text{ MPa}$$

$$\phi_{vc} = 0.573 \text{ MPa OK}$$



b. En dos direcciones (d/2)

ZAPATA TIPO 3 (4 Und).

$$\begin{aligned} L &= 2.700 \text{ m} \\ d/2 &= 0.215 \text{ m} \\ l - d/2 &= 0.835 \text{ m} \end{aligned}$$

$$\begin{aligned} H &= 0.50 \text{ m} \\ h &= 0.30 \text{ m} \\ H - h &= 0.20 \text{ m} \end{aligned}$$

$$\begin{aligned} V(d/2) &= 225.5 \text{ kN} \\ Vu(d/2) &= 1.5 * V(d/2) \\ Vu(d/2) &= 338.3 \text{ kN} \\ d_1 &= 0.397 \text{ m} \end{aligned}$$

$$v_u = \frac{Vu}{b_o * d_1} = 0.827 \text{ MPa}$$

$$\phi_{vc} = 1.15 \text{ MPa OK}$$

DISEÑO DE ZAPATAS CONCENTRICAS PROYECTO: I.E. EL SUR (IPIALES)

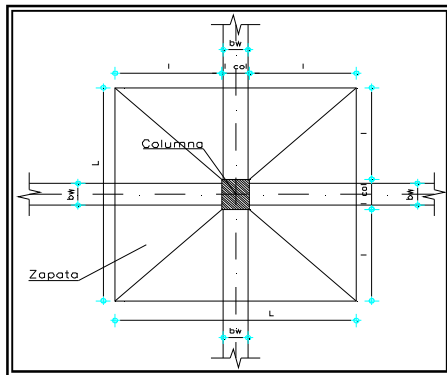
ZAPATA TIPO 4 (4 Und).

$$\begin{aligned} \text{Columna } b &= 40 \text{ cm} \\ t &= 80 \text{ cm} \end{aligned}$$

$$\begin{aligned} f_c &= 21.0 \text{ MPa} \\ f_y &= 420.0 \text{ MPa} \end{aligned}$$

$$\sigma = 0.145 \text{ MPa}$$

PREDIMENSIONAMIENTO



$$\begin{aligned} L &= 3.500 \text{ m} \\ l_{col} &= 0.800 \text{ m} \\ l &= 1.350 \text{ m} \end{aligned}$$

Cargas		
Mu =	0	kN*m
Pu =	1557.2	kN
Pp (10%) =	156	kN
Σ P =	1713	kN

$$Area\ necesaria = \frac{\Sigma P}{\sigma} = \frac{1712.95}{0.145} = 11.81 \text{ m}^2$$

$$\begin{aligned} e &= 0.00 \text{ m} \\ L &= 3.437 \text{ m} \end{aligned} \quad Aproximamos = 3.50 \text{ m}$$

$$Carga\ de\ diseño = \frac{P_u}{A\ real} = \frac{1557.23}{12.250} = 0.127 \text{ MPa}$$

Esfuerzos		
σ _{máx} =	0.140 MPa	OK
σ _{min} =	0.140 MPa	OK

DISEÑO DE ZAPATA CONCENTRICA

FLEXIÓN

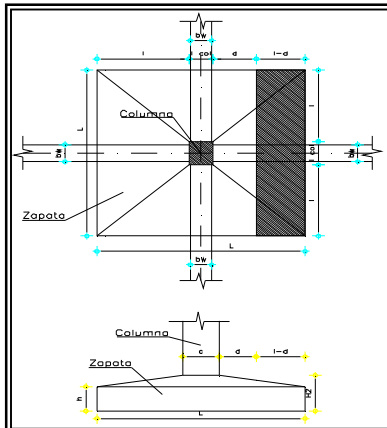
$$\begin{aligned} M\ \text{borde de la columna} &= 127.42 \text{ kN*m} \\ Mu &= 1.7 * M\ \text{borde de la columna} = 216.62 \text{ kN*m} \end{aligned}$$

Con el criterio de calcular el refuerzo por metro lineal utilizamos una altura efectiva igual a:

$$\begin{aligned} d &= 0.53 \text{ m} \\ \text{Cuantia} &= 0.00200 \\ As &= 10.60 \text{ cm}^2/\text{m} \end{aligned}$$

Armadura: 32#438 c./0.11 m en ambos sentidos

CORTANTE



a. En una dirección (d)

$$\begin{aligned} L &= 3.50 \text{ m} \\ l &= 1.35 \text{ m} \\ l - d &= 0.82 \text{ m} \end{aligned}$$

$$\begin{aligned} H &= 0.60 \text{ m} \\ h &= 0.30 \text{ m} \\ H-h &= 0.30 \text{ m} \end{aligned}$$

$$\begin{aligned} V(d) &= 401.32 \text{ kN} \\ Vu(d) &= 1.7 * V(d) \\ Vu(d) &= 682.24 \text{ kN} \\ h' &= 0.42 \text{ m} \end{aligned}$$

$$v_v = \frac{Vu}{L * h'} = 0.465 \text{ MPa}$$

$$\phi v_c = 0.573 \text{ MPa OK}$$

b. En dos direcciones (d/2)

ZAPATA TIPO 4 (4 Und).

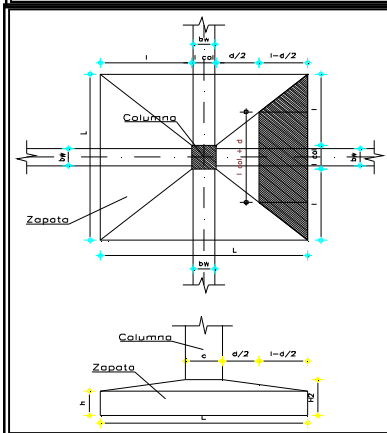
$$\begin{aligned} L &= 3.500 \text{ m} \\ d/2 &= 0.265 \text{ m} \\ l - d/2 &= 1.085 \text{ m} \end{aligned}$$

$$\begin{aligned} H &= 0.60 \text{ m} \\ h &= 0.30 \text{ m} \\ H-h &= 0.30 \text{ m} \end{aligned}$$

$$\begin{aligned} V(d/2) &= 366.4 \text{ kN} \\ Vu(d/2) &= 1.5 * V(d) \\ Vu(d/2) &= 549.6 \text{ kN} \\ d_1 &= 0.48038462 \text{ m} \end{aligned}$$

$$v_u = \frac{Vu}{b_o * d_1} = 0.860 \text{ MPa}$$

$$\phi v_c = 1.15 \text{ MPa OK}$$



5. DISEÑO DE VIGAS Y COLUMNAS

*DISEÑO DE VIGAS Y
COLUMNAS*

PROYECTO: I.E EL SUR (IPIALES)

V-101/N: +2.75

B=0.15 H=0.50 L=1.68			B=0.15 H=0.50 L=3.75			B=0.15 H=0.50 L=3.75		
Mu=-3.56 As=0.00 As(r)=2.21	Mu=-23.44 As=5.70 As(r)=2.21	Mu=-56.69 As=5.70 As(r)=3.59	Mu=-14.17 As=2.54 As(r)=2.21	Mu=-23.08 As=2.54 As(r)=2.21	Mu=-92.31 As=7.76 As(r)=6.14			
Mu=4.26 As=3.96 As(r)=2.21			Mu=38.48 As=3.96 As(r)=2.48			Mu=23.08 As=3.96 As(r)=2.21		
Vu=-8.61	Vu=10.85	Vu=19.29	Vu=-45.53	Vu=-18.25	Vu=19.46	Vu=-6.79	Vu=28.31	Vu=58.83

B=0.15 H=0.50 L=4.65			B=0.15 H=0.50 L=4.65			B=0.15 H=0.50 L=2.85		
Mu=-104.26 As=7.76 As(r)=7.06	Mu=-26.06 As=2.54 As(r)=2.21	Mu=-22.27 As=2.54 As(r)=2.21	Mu=-89.08 As=7.76 As(r)=5.89	Mu=-69.69 As=7.76 As(r)=4.49	Mu=-18.46 As=2.54 As(r)=2.21			
Mu=52.13 As=7.92 As(r)=3.28			Mu=44.54 As=6.04 As(r)=2.98			Mu=17.42 As=4.85 As(r)=2.21		
Vu=-70.22	Vu=-30.92	Vu=9.82	Vu=-12.25	Vu=27.89	Vu=67.22	Vu=-37.47	Vu=-18.17	Vu=10.96

B=0.15 H=0.50 L=2.85			B=0.15 H=0.50 L=4.65			B=0.15 H=0.50 L=4.65		
Mu=-18.23 As=2.54 As(r)=2.21	Mu=-64.39 As=7.76 As(r)=4.12	Mu=-85.82 As=7.76 As(r)=5.65	Mu=-21.45 As=2.54 As(r)=2.21	Mu=-29.73 As=2.54 As(r)=2.21	Mu=-118.92 As=10.14 As(r)=8.25			
Mu=16.10 As=6.63 As(r)=2.21			Mu=42.91 As=3.96 As(r)=2.92			Mu=29.73 As=3.96 As(r)=2.21		
Vu=-12.18	Vu=16.54	Vu=35.83	Vu=-65.82	Vu=-26.53	Vu=13.75	Vu=-8.34	Vu=33.14	Vu=72.48

B=0.15 H=0.50 L=4.58			B=0.15 H=0.50 L=4.59			B=0.15 H=0.50 L=5.25		
Mu=-117.29 As=10.14 As(r)=8.12	Mu=-29.32 As=2.54 As(r)=2.21	Mu=-21.71 As=2.54 As(r)=2.21	Mu=-86.82 As=7.76 As(r)=5.73	Mu=-72.94 As=7.76 As(r)=4.72	Mu=-56.70 As=5.70 As(r)=3.59			
Mu=29.32 As=3.96 As(r)=2.21			Mu=43.41 As=3.96 As(r)=2.70			Mu=18.23 As=3.96 As(r)=2.21		
Vu=-71.15	Vu=-32.47	Vu=8.29	Vu=-14.04	Vu=26.21	Vu=64.94	Vu=-48.81	Vu=-6.33	Vu=43.50

B=0.15 H=0.50 L=3.69			B=0.15 H=0.50 L=3.69			B=0.15 H=0.50 L=1.68		
Mu=-58.91 As=5.70 As(r)=3.74	Mu=-14.73 As=2.54 As(r)=2.21	Mu=-13.94 As=2.54 As(r)=2.21	Mu=-55.77 As=5.70 As(r)=3.53	Mu=-24.69 As=5.70 As(r)=2.21	Mu=-3.81 As=0.00 As(r)=2.21			
Mu=29.45 As=3.96 As(r)=2.21			Mu=39.00 As=3.96 As(r)=2.60			Mu=3.89 As=3.89 As(r)=2.21		
Vu=-52.41	Vu=-22.53	Vu=10.65	Vu=-15.82	Vu=20.08	Vu=47.91	Vu=-20.51	Vu=-12.07	Vu=9.32

PROYECTO: I.E EL SUR (IPIALES)

V-102/N: + 2.75

B=0.40 H=0.50 L=1.68			B=0.40 H=0.50 L=7.70			B=0.40 H=0.50 L=9.50		
Mu=-0.00 As=0.00 As(r)=5.89	Mu=-137.62 As=-24.72 As(r)=8.66	Mu=-332.09 As=24.72 As(r)=23.27	Mu=-417.69 As=33.92 As(r)=28.66	Mu=-453.67 As=33.92 As(r)=30.18	Mu=-438.95 As=33.92 As(r)=29.36			
Mu=0.00 As=15.52 As(r)=5.89			Mu=208.32 As=17.45 As(r)=13.57			Mu=311.02 As=15.52 As(r)=21.50		
Vu=62.91	Vu=76.03	Vu=89.15	Vu=-169.68	Vu=-81.09	Vu=195.32	Vu=-216.07	Vu=-88.36	Vu=211.06

B=0.40 H=0.50 L=5.90			B=0.40 H=0.50 L=9.50			B=0.40 H=0.50 L=9.37		
Mu=-344.87 As=33.92 As(r)=24.37	Mu=-322.82 As=24.72 As(r)=22.48	Mu=-437.44 As=33.92 As(r)=29.27	Mu=-481.11 As=38.10 As(r)=31.72	Mu=-481.96 As=38.10 As(r)=31.77	Mu=-431.21 As=33.92 As(r)=28.92			
Mu=102.75 As=17.45 As(r)=6.36			Mu=298.78 As=15.52 As(r)=20.49			Mu=294.69 As=15.52 As(r)=20.16		
Vu=-169.24	Vu=-108.68	Vu=162.70	Vu=-207.30	Vu=-83.24	Vu=216.88	Vu=-215.95	Vu=-94.30	Vu=205.81

B=0.40 H=0.50 L=5.25			B=0.40 H=0.50 L=7.57			B=0.40 H=0.50 L=1.68		
Mu=-331.77 As=33.92 As(r)=23.24	Mu=-303.32 As=24.72 As(r)=20.86	Mu=-337.16 As=24.72 As(r)=23.70	Mu=-328.71 As=27.10 As(r)=22.98	Mu=-143.03 As=27.10 As(r)=9.02	Mu=-0.00 As=0.00 As(r)=5.89			
Mu=82.94 As=15.52 As(r)=5.89			Mu=234.09 As=15.52 As(r)=15.46			Mu=0.00 As=17.45 As(r)=5.89		
Vu=-229.37	Vu=-50.84	Vu=226.81	Vu=-182.42	Vu=-95.86	Vu=175.10	Vu=-92.35	Vu=-79.23	Vu=-66.10

V-103/N: + 2.75

B=0.20 H=0.50 L=1.67			B=0.20 H=0.50 L=7.70			B=0.20 H=0.50 L=9.50		
Mu=-3.74 As=0.00 As(r)=2.94	Mu=-58.65 As=7.76 As(r)=3.65	Mu=-113.19 As=7.76 As(r)=7.44	Mu=-176.30 As=16.96 As(r)=12.53	Mu=-192.51 As=16.96 As(r)=14.01	Mu=-164.09 As=16.96 As(r)=11.47			
Mu=0.00 As=7.76 As(r)=2.94			Mu=59.81 As=7.76 As(r)=4.34			Mu=96.26 As=7.76 As(r)=6.37		
Vu=19.26	Vu=29.41	Vu=39.56	Vu=-80.46	Vu=16.78	Vu=102.27	Vu=-119.34	Vu=6.01	Vu=113.52

B=0.20 H=0.50 L=5.90			B=0.20 H=0.50 L=9.50			B=0.20 H=0.50 L=9.37		
Mu=-129.54 As=16.96 As(r)=8.68	Mu=-124.56 As=16.96 As(r)=8.30	Mu=-160.74 As=16.96 As(r)=11.18	Mu=-217.78 As=16.96 As(r)=14.58	Mu=-217.43 As=16.96 As(r)=14.56	Mu=-131.00 As=10.71 As(r)=8.79			
Mu=32.38 As=7.76 As(r)=2.94			Mu=89.27 As=7.76 As(r)=6.17			Mu=90.55 As=7.76 As(r)=6.58		
Vu=-69.38	Vu=-18.15	Vu=67.68	Vu=-111.91	Vu=13.11	Vu=123.67	Vu=-123.30	Vu=-6.21	Vu=103.92

PROYECTO: I.E EL SUR (IPIALES)

V-103A/N: +2.75

B=0.20 H=0.50 L=7.57			B=0.20 H=0.50 L=1.68		
Mu=-92.62 As=7.76 As(r)=5.96	Mu=-111.76 As=10.14 As(r)=7.34		Mu=-57.49 As=10.14 As(r)=3.58	Mu=-3.88 As=0.00 As(r)=2.94	
Mu=78.40 As=7.76 As(r)=5.07			Mu=0.00 As=7.76 As(r)=2.94		
Vu=-84.22	Vu=8.08	Vu=85.31	Vu=-38.92	Vu=-28.77	Vu=-18.61

V-104/N: +2.75

B=0.15 H=0.50 L=5.25		
Mu=-70.67 As=5.70 As(r)=4.56	Mu=-53.25 As=3.96 As(r)=3.36	
Mu=17.67 As=3.96 As(r)=2.21		
Vu=-33.49	Vu=-9.21	Vu=29.14

V-105/N: +2.75

B=0.30 H=0.50 L=1.68			B=0.30 H=0.50 L=7.70			B=0.30 H=0.50 L=9.50		
Mu=-0.00 As=0.00 As(r)=4.42	Mu=-67.01 As=22.03 As(r)=4.42		Mu=-249.55 As=22.03 As(r)=17.49	Mu=-292.38 As=25.44 As(r)=21.35		Mu=-317.16 As=25.44 As(r)=21.50	Mu=-305.15 As=25.44 As(r)=21.50	
Mu=0.00 As=9.58 As(r)=4.42			Mu=106.44 As=10.55 As(r)=6.71			Mu=175.12 As=9.58 As(r)=11.56		
Vu=22.59	Vu=36.39	Vu=50.20	Vu=-124.33	Vu=-46.31	Vu=136.95	Vu=-147.71	Vu=-46.04	Vu=145.53

B=0.30 H=0.50 L=5.90			B=0.30 H=0.50 L=9.50			B=0.30 H=0.50 L=9.37		
Mu=-240.91 As=25.44 As(r)=16.76	Mu=-224.07 As=25.44 As(r)=15.37		Mu=-315.75 As=25.44 As(r)=21.50	Mu=-338.98 As=28.58 As(r)=22.56		Mu=-340.50 As=28.58 As(r)=22.65	Mu=-303.64 As=25.44 As(r)=21.50	
Mu=60.23 As=10.55 As(r)=4.42			Mu=166.89 As=9.58 As(r)=10.95			Mu=166.31 As=9.58 As(r)=10.91		
Vu=-119.56	Vu=-64.70	Vu=112.54	Vu=-146.35	Vu=-44.68	Vu=150.49	Vu=-151.34	Vu=-51.33	Vu=144.22

B=0.30 H=0.50 L=5.25			B=0.30 H=0.50 L=7.57			B=0.30 H=0.50 L=1.68		
Mu=-158.13 As=25.44 As(r)=10.32	Mu=-147.00 As=22.03 As(r)=9.52		Mu=-227.82 As=22.03 As(r)=15.67	Mu=-237.55 As=22.03 As(r)=16.48		Mu=-70.02 As=22.03 As(r)=4.42	Mu=-0.00 As=0.00 As(r)=4.42	
Mu=39.53 As=9.58 As(r)=4.42			Mu=126.36 As=9.58 As(r)=8.07			Mu=0.00 As=10.55 As(r)=4.42		
Vu=-54.37	Vu=43.63	Vu=55.83	Vu=-126.51	Vu=-50.14	Vu=125.96	Vu=-51.79	Vu=-37.98	Vu=-24.18

PROYECTO: I.E EL SUR (IPIALES)

V-106/N: +2.75

B=0.15 H=0.50 L=6.65			B=0.15 H=0.50 L=2.00		
Mu=-18.66 As=3.96 As(r)=2.21	Mu=-70.67 As=5.70 As(r)=4.56	Mu=-45.26 As=5.70 As(r)=2.82	Mu=-4.20 As=2.44 As(r)=2.21		
Mu=28.15 As=3.96 As(r)=2.21		Mu=0.00 As=3.96 As(r)=2.21			
Vu=-22.59	Vu=17.25	Vu=36.47	Vu=-26.79	Vu=-17.70	Vu=-8.61

V-107/N: +2.75

B=0.40 H=0.50 L=6.45			B=0.40 H=0.50 L=2.15		
Mu=-244.73 As=20.28 As(r)=16.26	Mu=-365.92 As=29.19 As(r)=26.25	Mu=-207.68 As=29.19 As(r)=13.52	Mu=-0.00 As=0.00 As(r)=5.89		
Mu=138.03 As=11.40 As(r)=8.69		Mu=0.00 As=11.40 As(r)=5.89			
Vu=-141.16	Vu=-70.66	Vu=176.81	Vu=111.25	Vu=86.56	Vu=62.86

V-108/N: +2.75

B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=2.15		
Mu=-35.60 As=3.96 As(r)=2.94	Mu=-15.95 As=3.96 As(r)=2.94	Mu=-32.47 As=3.96 As(r)=2.94	Mu=-129.88 As=10.14 As(r)=8.70	Mu=-100.33 As=10.14 As(r)=6.51	Mu=-3.83 As=0.00 As(r)=2.94			
Mu=61.25 As=5.70 As(r)=3.99		Mu=32.47 As=5.70 As(r)=2.94		Mu=0.00 As=5.70 As(r)=2.94				
Vu=-56.95	Vu=-22.28	Vu=21.57	Vu=21.73	Vu=50.73	Vu=80.59	Vu=61.06	Vu=39.39	Vu=20.93

V-109/N: +2.75

B=0.40 H=0.50 L=6.45			B=0.40 H=0.50 L=2.15		
Mu=-309.70 As=27.10 As(r)=21.39	Mu=-469.62 As=38.10 As(r)=31.07	Mu=-372.13 As=38.10 As(r)=26.82	Mu=-0.00 As=0.00 As(r)=5.89		
Mu=227.12 As=17.90 As(r)=14.94		Mu=0.00 As=17.90 As(r)=5.89			
Vu=-184.24	Vu=-106.86	Vu=235.47	Vu=179.44	Vu=154.24	Vu=129.05

V-110/N: +2.75

B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=2.15		
Mu=-35.10 As=3.96 As(r)=2.94	Mu=-19.54 As=3.96 As(r)=2.94	Mu=-33.59 As=3.96 As(r)=2.94	Mu=-134.35 As=10.14 As(r)=9.05	Mu=-106.25 As=10.14 As(r)=6.94	Mu=-4.71 As=0.00 As(r)=2.94			
Mu=68.33 As=5.70 As(r)=4.77		Mu=33.59 As=5.70 As(r)=2.94		Mu=0.00 As=5.70 As(r)=2.94				
Vu=-63.74	Vu=-27.80	Vu=15.17	Vu=28.29	Vu=57.60	Vu=90.02	Vu=63.16	Vu=41.49	Vu=20.81

PROYECTO: I.E EL SUR (IPIALES)

V-111/N: +2.75

B=0.40 H=0.50 L=6.25			B=0.40 H=0.50 L=2.15		
Mu=-278.48 As=27.10 As(r)=18.87	Mu=-438.95 As=38.10 As(r)=29.36	Mu=-313.53 As=38.10 As(r)=21.70	Mu=-0.00 As=0.00 As(r)=5.89		
Mu=197.57 As=17.90 As(r)=12.80		Mu=0.00 As=17.90 As(r)=5.89			
Vu=168.59	Vu=91.80	Vu=-216.59	Vu=155.09	Vu=129.89	Vu=104.69

V-112/N: +2.75

B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=2.15		
Mu=-31.71 As=3.96 As(r)=2.94	Mu=-13.53 As=3.96 As(r)=2.94	Mu=-31.08 As=3.96 As(r)=2.94	Mu=-124.30 As=10.14 As(r)=8.28	Mu=-93.27 As=10.14 As(r)=6.01	Mu=-5.43 As=0.00 As(r)=2.94			
Mu=54.13 As=5.70 As(r)=3.36		Mu=31.08 As=5.70 As(r)=2.94		Mu=0.00 As=5.70 As(r)=2.94				
Vu=48.18	Vu=14.84	Vu=-30.12	Vu=-13.30	Vu=-42.20	Vu=-71.10	Vu=56.92	Vu=36.22	Vu=19.05

V-113/N: +2.75

B=0.40 H=0.50 L=6.25			B=0.40 H=0.50 L=2.15		
Mu=-298.64 As=27.10 As(r)=20.48	Mu=-433.48 As=38.10 As(r)=29.05	Mu=-306.28 As=38.10 As(r)=21.10	Mu=-0.00 As=0.00 As(r)=5.89		
Mu=191.10 As=17.90 As(r)=12.34		Mu=0.00 As=17.90 As(r)=5.89			
Vu=-172.04	Vu=-95.24	Vu=213.76	Vu=152.05	Vu=126.85	Vu=101.66

V-114/N: +2.75

B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=2.15		
Mu=-37.09 As=3.96 As(r)=2.94	Mu=-18.82 As=3.96 As(r)=2.94	Mu=-33.11 As=3.96 As(r)=2.94	Mu=-132.44 As=10.14 As(r)=8.90	Mu=-104.40 As=10.14 As(r)=6.80	Mu=-4.95 As=0.00 As(r)=2.94			
Mu=65.92 As=5.70 As(r)=4.59		Mu=33.11 As=5.70 As(r)=2.94		Mu=0.00 As=5.70 As(r)=2.94				
Vu=-63.10	Vu=-27.23	Vu=15.92	Vu=26.75	Vu=55.76	Vu=87.95	Vu=62.30	Vu=40.63	Vu=20.26

V-115/N: +2.75

B=0.40 H=0.50 L=6.15			B=0.40 H=0.50 L=2.15		
Mu=-360.07 As=27.10 As(r)=25.72	Mu=-506.91 As=38.10 As(r)=33.16	Mu=-407.50 As=38.10 As(r)=28.66	Mu=-0.00 As=8.91 As(r)=5.89		
Mu=245.49 As=17.90 As(r)=16.32		Mu=0.00 As=17.90 As(r)=5.89			
Vu=-203.02	Vu=-125.64	Vu=251.09	Vu=194.03	Vu=168.83	Vu=143.63

PROYECTO: I.E EL SUR (IPIALES)

V-116/N: +2.75

B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=2.15		
Mu=-41.28 As=3.96 As(r)=2.94	Mu=-19.42 As=3.96 As(r)=2.94	Mu=-35.37 As=3.96 As(r)=2.94	Mu=-141.47 As=10.14 As(r)=9.61	Mu=-104.53 As=10.14 As(r)=6.81	Mu=-5.73 As=0.00 As(r)=2.94			
Mu=68.48 As=5.70 As(r)=4.72			Mu=35.37 As=5.70 As(r)=2.94			Mu=0.00 As=5.70 As(r)=2.94		
Vu=-64.42	Vu=-29.47	Vu=15.79	Vu=30.18	Vu=59.19	Vu=90.37	Vu=62.06	Vu=40.39	Vu=20.92

V-117/N: +2.75

B=0.40 H=0.50 L=6.25			B=0.40 H=0.50 L=2.15		
Mu=-277.91 As=27.10 As(r)=18.82	Mu=-403.57 As=33.92 As(r)=28.66	Mu=-337.56 As=33.92 As(r)=23.74	Mu=-0.00 As=0.00 As(r)=5.89		
Mu=122.19 As=18.16 As(r)=8.43			Mu=0.00 As=15.52 As(r)=5.89		
Vu=-143.51	Vu=-69.26	Vu=172.83	Vu=164.14	Vu=138.95	Vu=113.75

V-118/N: +2.75

B=0.40 H=0.50 L=6.45			B=0.40 H=0.50 L=2.15		
Mu=-237.24 As=20.28 As(r)=15.70	Mu=-367.17 As=33.92 As(r)=26.36	Mu=-294.83 As=33.92 As(r)=20.17	Mu=-0.00 As=0.00 As(r)=5.89		
Mu=106.03 As=15.52 As(r)=7.58			Mu=0.00 As=15.52 As(r)=5.89		
Vu=-126.99	Vu=-55.59	Vu=157.97	Vu=146.31	Vu=121.11	Vu=95.91

V-119/N: +2.75

B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=2.15		
Mu=-43.10 As=3.96 As(r)=2.94	Mu=-17.38 As=3.96 As(r)=2.94	Mu=-36.14 As=3.96 As(r)=2.94	Mu=-144.57 As=10.14 As(r)=9.86	Mu=-103.53 As=10.14 As(r)=6.74	Mu=-3.43 As=0.00 As(r)=2.94			
Mu=66.26 As=5.70 As(r)=4.36			Mu=36.14 As=5.70 As(r)=2.94			Mu=0.00 As=5.70 As(r)=2.94		
Vu=-60.53	Vu=-26.60	Vu=20.12	Vu=28.11	Vu=57.12	Vu=86.13	Vu=62.65	Vu=40.98	Vu=23.36

V-120/N: +2.75

B=0.40 H=0.50 L=6.45			B=0.40 H=0.50 L=2.15		
Mu=-285.61 As=20.28 As(r)=19.43	Mu=-414.75 As=33.92 As(r)=28.66	Mu=-213.98 As=33.92 As(r)=13.98	Mu=-0.00 As=0.00 As(r)=5.89		
Mu=144.34 As=15.52 As(r)=9.11			Mu=0.00 As=15.52 As(r)=5.89		
Vu=155.12	Vu=84.61	Vu=-192.74	Vu=-113.92	Vu=-89.22	Vu=-65.04

PROYECTO: I.E EL SUR (IPIALES)

V-121/N: +2.75

B=0.15 H=0.50 L=6.65			B=0.15 H=0.50 L=2.15		
Mu=-23.93 As=3.96 As(r)=2.21	Mu=-78.65 As=5.70 As(r)=5.13	Mu=-48.03 As=5.70 As(r)=3.01	Mu=-4.15 As=0.00 As(r)=2.21		
Mu=19.66 As=3.96 As(r)=2.21		Mu=1.55 As=3.96 As(r)=2.21			
Vu=-24.18	Vu=18.94	Vu=38.60	Vu=-27.50	Vu=-18.41	Vu=-9.32

V-201/N: +6.00

B=0.15 H=0.50 L=1.68			B=0.15 H=0.50 L=7.70			B=0.15 H=0.50 L=9.50		
Mu=-2.52 As=0.00 As(r)=2.21	Mu=-5.37 As=2.54 As(r)=2.21	Mu=-18.02 As=2.54 As(r)=2.21	Mu=-17.68 As=2.54 As(r)=2.21	Mu=-21.58 As=2.54 As(r)=2.21		Mu=-21.48 As=2.54 As(r)=2.21		
Mu=1.61 As=2.54 As(r)=2.21		Mu=9.20 As=2.54 As(r)=2.21		Mu=11.94 As=2.54 As(r)=2.21				
Vu=-4.23	Vu=2.22	Vu=4.09	Vu=-9.92	Vu=2.26	Vu=11.01	Vu=-12.81	Vu=-1.02	Vu=12.14

B=0.15 H=0.50 L=2.85			B=0.15 H=0.50 L=2.85			B=0.15 H=0.50 L=4.65		
Mu=-31.24 As=2.54 As(r)=2.21	Mu=-7.81 As=2.54 As(r)=2.21	Mu=-15.97 As=2.54 As(r)=2.21	Mu=-63.86 As=7.76 As(r)=4.08	Mu=-88.16 As=7.76 As(r)=5.83		Mu=-22.04 As=2.54 As(r)=2.21		
Mu=11.24 As=3.17 As(r)=2.21		Mu=15.97 As=4.44 As(r)=2.21		Mu=44.08 As=2.54 As(r)=2.78				
Vu=-30.23	Vu=-10.69	Vu=15.22	Vu=-6.03	Vu=20.27	Vu=42.01	Vu=-65.93	Vu=-26.63	Vu=13.05

B=0.15 H=0.50 L=4.65			B=0.15 H=0.50 L=4.58			B=0.15 H=0.50 L=4.59		
Mu=-29.35 As=2.54 As(r)=2.21	Mu=-117.40 As=10.14 As(r)=8.12	Mu=-115.42 As=10.14 As(r)=7.96	Mu=-28.86 As=2.54 As(r)=2.21	Mu=-22.13 As=2.54 As(r)=2.21		Mu=-88.53 As=7.76 As(r)=5.85		
Mu=29.35 As=2.54 As(r)=2.21		Mu=28.86 As=2.54 As(r)=2.21		Mu=44.26 As=2.54 As(r)=2.76				
Vu=-8.35	Vu=32.51	Vu=71.84	Vu=-70.47	Vu=-31.80	Vu=8.35	Vu=-13.09	Vu=26.23	Vu=64.96

B=0.15 H=0.50 L=5.25			B=0.15 H=0.50 L=7.57			B=0.15 H=0.50 L=1.68		
Mu=-73.50 As=7.76 As(r)=4.76	Mu=-31.45 As=2.54 As(r)=2.21	Mu=-19.37 As=2.54 As(r)=2.21	Mu=-23.41 As=2.54 As(r)=2.21	Mu=-6.62 As=2.54 As(r)=2.21		Mu=-3.21 As=0.00 As(r)=2.21		
Mu=23.60 As=2.54 As(r)=2.21		Mu=6.81 As=4.87 As(r)=2.21		Mu=1.88 As=2.54 As(r)=2.21				
Vu=-53.80	Vu=-9.01	Vu=38.51	Vu=-10.68	Vu=-2.06	Vu=10.47	Vu=-4.54	Vu=3.20	Vu=5.23

PROYECTO: I.E EL SUR (IPIALES)

V-202/N: +6.00

B=0.15 H=0.50 L=1.68			B=0.15 H=0.50 L=7.70			B=0.15 H=0.50 L=9.50		
Mu=-0.41 As=0.00 As(r)=2.21	Mu=-15.48 As=2.54 As(r)=2.21	Mu=-21.54 As=2.54 As(r)=2.21	Mu=-19.98 As=2.54 As(r)=2.21	Mu=-24.17 As=2.54 As(r)=2.21	Mu=-24.26 As=2.54 As(r)=2.21			
Mu=0.18 As=2.54 As(r)=2.21			Mu=9.01 As=2.54 As(r)=2.21			Mu=11.74 As=2.54 As(r)=2.21		
Vu=6.52	Vu=8.55	Vu=10.57	Vu=-10.78	Vu=2.78	Vu=11.53	Vu=-12.86	Vu=-1.59	Vu=12.09

V-202A/N: +6.00

B=0.15 H=0.50 L=7.57			B=0.15 H=0.50 L=1.68		
Mu=-22.42 As=2.54 As(r)=2.21	Mu=-28.06 As=2.54 As(r)=2.21	Mu=-17.94 As=2.54 As(r)=2.21	Mu=-0.58 As=0.00 As(r)=2.21		
Mu=7.02 As=2.54 As(r)=2.21			Mu=0.19 As=2.54 As(r)=2.21		
Vu=-11.37	Vu=3.17	Vu=11.71	Vu=-11.91	Vu=-9.89	Vu=-7.86

V-203/N: +6.00

B=0.40 H=0.50 L=1.68			B=0.40 H=0.50 L=7.70			B=0.40 H=0.50 L=9.50		
Mu=-0.00 As=0.00 As(r)=5.89	Mu=-79.49 As=13.46 As(r)=5.89	Mu=-106.89 As=13.46 As(r)=6.63	Mu=-79.32 As=13.46 As(r)=5.89	Mu=-101.74 As=13.46 As(r)=6.30	Mu=-116.36 As=15.52 As(r)=7.25			
Mu=0.00 As=9.66 As(r)=5.89			Mu=26.72 As=13.46 As(r)=5.89			Mu=29.09 As=9.66 As(r)=5.89		
Vu=38.67	Vu=44.07	Vu=49.47	Vu=-42.04	Vu=-18.72	Vu=36.83	Vu=-38.70	Vu=12.01	Vu=40.52

B=0.40 H=0.50 L=5.90			B=0.40 H=0.50 L=9.50			B=0.40 H=0.50 L=9.37		
Mu=-213.31 As=15.52 As(r)=13.93	Mu=-302.45 As=33.92 As(r)=20.79	Mu=-406.71 As=33.92 As(r)=28.66	Mu=-440.07 As=33.92 As(r)=29.42	Mu=-437.88 As=33.92 As(r)=29.30	Mu=-402.12 As=33.92 As(r)=28.66			
Mu=134.49 As=13.58 As(r)=8.45			Mu=297.97 As=9.66 As(r)=20.43			Mu=295.19 As=9.66 As(r)=20.20		
Vu=-135.84	Vu=-75.29	Vu=165.13	Vu=-208.72	Vu=-76.50	Vu=216.33	Vu=-215.49	Vu=-85.13	Vu=208.24

B=0.40 H=0.50 L=5.25			B=0.40 H=0.50 L=7.57			B=0.40 H=0.50 L=1.68		
Mu=-308.93 As=33.92 As(r)=21.32	Mu=-196.26 As=15.52 As(r)=12.71	Mu=-109.87 As=15.52 As(r)=6.82	Mu=-125.60 As=13.46 As(r)=7.86	Mu=-86.16 As=13.46 As(r)=5.89	Mu=-0.00 As=0.00 As(r)=5.89			
Mu=77.23 As=9.66 As(r)=5.89			Mu=31.40 As=9.66 As(r)=5.89			Mu=0.00 As=15.36 As(r)=5.89		
Vu=-238.30	Vu=-53.86	Vu=194.42	Vu=-40.61	Vu=19.99	Vu=42.95	Vu=-53.18	Vu=-47.78	Vu=-42.38

PROYECTO: I.E EL SUR (IPIALES)

V-204/N: +6.00

B=0.20 H=0.50 L=5.90			B=0.20 H=0.50 L=9.50			B=0.20 H=0.50 L=9.38		
Mu=-42.94 As=3.96 As(r)=2.94	Mu=-131.37 As=12.77 As(r)=8.82		Mu=-168.16 As=12.77 As(r)=11.82	Mu=-215.86 As=16.96 As(r)=14.48		Mu=-215.39 As=16.96 As(r)=14.45	Mu=-124.85 As=10.71 As(r)=8.32	
Mu=41.63 As=4.83 As(r)=2.94			Mu=88.40 As=7.77 As(r)=6.01			Mu=88.31 As=6.73 As(r)=6.42		
Vu=-49.19	Vu=13.39	Vu=80.97	Vu=-113.27	Vu=10.60	Vu=123.07	Vu=-122.42	Vu=-4.07	Vu=103.61

V-205/N: +6.00

B=0.20 H=0.50 L=7.70		
Mu=-70.26 As=5.70 As(r)=4.43		Mu=-66.15 As=5.70 As(r)=4.15
Mu=112.94 As=10.14 As(r)=7.43		
Vu=-74.37	Vu=-14.93	Vu=73.50

V-206/N: +6.00

B=0.15 H=0.50 L=5.25		
Mu=-66.77 As=5.70 As(r)=4.28	Mu=-23.94 As=5.70 As(r)=2.21	
Mu=16.69 As=3.96 As(r)=2.21		
Vu=-37.64	Vu=-13.37	Vu=22.10

V-207/N: +6.00

B=0.20 H=0.50 L=7.70		
Mu=-53.00 As=3.96 As(r)=3.29	Mu=-49.65 As=3.96 As(r)=3.07	
Mu=71.88 As=5.70 As(r)=4.55		
Vu=-67.61	Vu=14.18	Vu=67.27

V-208/N: +6.00

B=0.30 H=0.50 L=1.68			B=0.30 H=0.50 L=7.70			B=0.30 H=0.50 L=9.50		
Mu=-1.07 As=0.00 As(r)=4.42	Mu=-40.97 As=11.64 As(r)=4.42		Mu=-161.34 As=11.64 As(r)=10.55	Mu=-154.52 As=11.64 As(r)=10.05		Mu=-109.47 As=11.64 As(r)=6.91	Mu=-74.38 As=10.61 As(r)=4.60	
Mu=0.00 As=8.55 As(r)=4.42			Mu=120.92 As=11.36 As(r)=7.69			Mu=27.37 As=9.58 As(r)=4.42		
Vu=17.49	Vu=21.54	Vu=25.59	Vu=-93.65	Vu=-34.56	Vu=93.11	Vu=-34.32	Vu=-12.94	Vu=26.79

PROYECTO: I.E EL SUR (IPIALES)

B=0.30 H=0.50 L=5.90			B=0.30 H=0.50 L=9.50			B=0.30 H=0.50 L=9.37		
Mu=-144.21 As=10.61 As(r)=9.32	Mu=-205.47 As=22.03 As(r)=13.88		Mu=-281.02 As=22.03 As(r)=20.29	Mu=-303.67 As=24.12 As(r)=21.50		Mu=-302.14 As=24.12 As(r)=21.50	Mu=-274.10 As=24.12 As(r)=19.66	
Mu=65.75 As=11.36 As(r)=4.42			Mu=165.45 As=9.58 As(r)=10.85			Mu=165.18 As=9.58 As(r)=10.83		
Vu=-93.23	Vu=-38.37	Vu=112.30	Vu=-138.82	Vu=-37.15	Vu=143.16	Vu=-143.27	Vu=-43.26	Vu=137.80

B=0.30 H=0.50 L=5.25			B=0.30 H=0.50 L=7.57			B=0.30 H=0.50 L=1.68		
Mu=-127.82 As=24.12 As(r)=8.17	Mu=-78.89 As=8.55 As(r)=4.89	Mu=-81.53 As=8.55 As(r)=5.06	Mu=-103.74 As=8.55 As(r)=6.53	Mu=-42.16 As=8.55 As(r)=4.42	Mu=-0.54 As=0.00 As(r)=4.42			
Mu=31.95 As=9.58 As(r)=4.42	Mu=25.93 As=9.58 As(r)=4.42	Mu=0.00 As=11.48 As(r)=4.42						
Vu=-50.20	Vu=-38.00	Vu=32.91	Vu=-31.78	Vu=18.57	Vu=35.80	Vu=-26.57	Vu=-22.52	Vu=-18.47

V-209/N: +6.00

B=0.15 H=0.50 L=6.65			B=0.15 H=0.50 L=2.15		
Mu=-16.41 As=3.96 As(r)=2.21	Mu=-45.48 As=3.96 As(r)=2.84		Mu=-25.34 As=3.96 As(r)=2.21	Mu=-2.23 As=0.00 As(r)=2.21	
Mu=18.91 As=3.96 As(r)=2.21			Mu=0.00 As=3.96 As(r)=2.21		
Vu=-17.49	Vu=8.58	Vu=24.29	Vu=-14.96	Vu=-9.50	Vu=-4.23

V-210/N: +6.00

B=0.40 H=0.50 L=6.45			B=0.40 H=0.50 L=2.15		
Mu=-199.46 As=15.52 As(r)=12.93	Mu=-311.05 As=27.10 As(r)=21.50		Mu=-100.67 As=27.10 As(r)=6.23	Mu=-0.23 As=0.00 As(r)=5.89	
Mu=125.23 As=11.40 As(r)=7.97			Mu=0.00 As=11.40 As(r)=5.89		
Vu=-137.59	Vu=34.17	Vu=146.39	Vu=63.10	Vu=48.90	Vu=13.35

V-211/N: +6.00

B=0.20 H=0.50 L=1.52			B=0.20 H=0.50 L=1.52		
Mu=-30.93 As=3.96 As(r)=2.94	Mu=-11.96 As=3.96 As(r)=2.94		Mu=-0.00 As=3.96 As(r)=2.94	Mu=-0.00 As=2.85 As(r)=2.94	
Mu=27.63 As=3.96 As(r)=2.94			Mu=32.38 As=3.96 As(r)=2.94		
Vu=-50.34	Vu=-36.27	Vu=-22.19	Vu=8.22	Vu=17.54	Vu=28.98

PROYECTO: I.E EL SUR (IPIALES)

V-212/N: +6.00

B=0.40 H=0.50 L=6.45			B=0.40 H=0.50 L=2.15		
Mu=-210.23 As=15.52 As(r)=13.71	Mu=-335.41 As=27.10 As(r)=23.55		Mu=-137.25 As=27.10 As(r)=8.63	Mu=-0.17 As=0.00 As(r)=5.89	
Mu=131.82 As=11.72 As(r)=8.28			Mu=0.00 As=11.72 As(r)=5.89		
Vu=-147.66	Vu=35.71	Vu=160.82	Vu=83.58	Vu=62.47	Vu=23.70

V-213/N: +6.00

B=0.40 H=0.50 L=6.25			B=0.40 H=0.50 L=2.15		
Mu=-190.39 As=15.52 As(r)=12.29	Mu=-349.18 As=29.19 As(r)=24.75		Mu=-192.56 As=29.19 As(r)=12.44	Mu=-0.00 As=0.00 As(r)=5.89	
Mu=91.28 As=10.02 As(r)=6.45			Mu=0.00 As=9.66 As(r)=5.89		
Vu=121.29	Vu=-42.03	Vu=-165.80	Vu=113.63	Vu=82.50	Vu=40.81

V-214/N: +6.00

B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=2.15		
Mu=-34.14 As=3.96 As(r)=2.94	Mu=-14.03 As=3.96 As(r)=2.94		Mu=-32.67 As=3.96 As(r)=2.94	Mu=-130.66 As=10.14 As(r)=8.76		Mu=-93.66 As=10.14 As(r)=6.04	Mu=-4.05 As=0.00 As(r)=2.94	
Mu=55.76 As=3.96 As(r)=3.49			Mu=32.67 As=3.96 As(r)=2.94			Mu=0.00 As=3.96 As(r)=2.94		
Vu=50.75	Vu=17.41	Vu=-27.18	Vu=-17.35	Vu=-46.25	Vu=-75.16	Vu=57.97	Vu=36.72	Vu=19.55

V-215/N: +6.00

B=0.40 H=0.50 L=6.25			B=0.40 H=0.50 L=2.15		
Mu=-286.87 As=20.28 As(r)=19.53	Mu=-451.22 As=33.92 As(r)=30.04		Mu=-320.94 As=33.92 As(r)=22.32	Mu=-0.00 As=0.00 As(r)=5.89	
Mu=201.35 As=17.90 As(r)=13.07			Mu=0.00 As=17.90 As(r)=5.89		
Vu=-171.19	Vu=-94.39	Vu=222.02	Vu=158.34	Vu=133.14	Vu=107.94

V-216/N: +6.00

B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=2.15		
Mu=-33.78 As=3.96 As(r)=2.94	Mu=-18.66 As=3.96 As(r)=2.94		Mu=-33.16 As=3.96 As(r)=2.94	Mu=-132.65 As=10.14 As(r)=8.92		Mu=-105.89 As=10.14 As(r)=6.91	Mu=-5.04 As=0.00 As(r)=2.94	
Mu=66.10 As=5.70 As(r)=4.58			Mu=33.16 As=5.70 As(r)=2.94			Mu=0.00 As=5.70 As(r)=2.94		
Vu=-62.01	Vu=-25.88	Vu=16.42	Vu=26.47	Vu=55.85	Vu=88.28	Vu=62.83	Vu=41.16	Vu=20.33

PROYECTO: I.E EL SUR (IPIALES)

V-217/N: +6.00

B=0.40 H=0.50 L=6.25			B=0.40 H=0.50 L=2.15		
Mu=-324.68 As=27.10 As(r)=22.64	Mu=-497.83 As=38.10 As(r)=32.65	Mu=-404.30 As=38.10 As(r)=28.66	Mu=-0.00 As=0.00 As(r)=5.89		
Mu=244.40 As=20.28 As(r)=16.24		Mu=0.00 As=20.28 As(r)=5.89			
Vu=-192.64	Vu=-115.26	Vu=248.27	Vu=192.71	Vu=167.51	Vu=142.32

V-218/N: +6.00

B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=3.22			B=0.20 H=0.50 L=2.15		
Mu=-37.19 As=3.96 As(r)=2.94	Mu=-19.72 As=3.96 As(r)=2.94	Mu=-34.93 As=3.96 As(r)=2.94	Mu=-139.70 As=10.14 As(r)=9.47	Mu=-106.29 As=10.14 As(r)=6.94	Mu=-5.79 As=0.00 As(r)=2.94			
Mu=68.63 As=5.70 As(r)=4.80		Mu=34.93 As=5.70 As(r)=2.94		Mu=0.00 As=5.70 As(r)=2.94				
Vu=-64.29	Vu=-28.56	Vu=14.99	Vu=30.16	Vu=59.25	Vu=91.68	Vu=62.72	Vu=41.05	Vu=20.61

V-219/N: +6.00

B=0.40 H=0.50 L=6.25			B=0.40 H=0.50 L=2.15		
Mu=-264.45 As=20.28 As(r)=17.77	Mu=-415.57 As=33.92 As(r)=28.66	Mu=-348.72 As=33.92 As(r)=24.71	Mu=-0.00 As=0.00 As(r)=5.89		
Mu=138.49 As=13.46 As(r)=9.26		Mu=0.00 As=13.46 As(r)=5.89			
Vu=-157.71	Vu=-54.68	Vu=192.22	Vu=169.16	Vu=143.96	Vu=118.76

V-220/N: +6.00

B=0.40 H=0.50 L=6.45			B=0.40 H=0.50 L=2.15		
Mu=-174.26 As=13.46 As(r)=11.16	Mu=-312.12 As=27.10 As(r)=21.59	Mu=-203.16 As=27.10 As(r)=13.20	Mu=-0.57 As=0.00 As(r)=5.89		
Mu=78.03 As=13.46 As(r)=5.89		Mu=0.00 As=13.46 As(r)=5.89			
Vu=-90.66	Vu=71.44	Vu=126.71	Vu=115.33	Vu=85.59	Vu=47.32

V-221/N: +6.00

B=0.40 H=0.50 L=6.45			B=0.40 H=0.50 L=2.15		
Mu=-152.24 As=13.46 As(r)=9.64	Mu=-274.84 As=24.72 As(r)=18.58	Mu=-105.13 As=24.72 As(r)=6.52	Mu=-0.19 As=0.00 As(r)=5.89		
Mu=68.71 As=13.46 As(r)=5.89		Mu=0.00 As=13.46 As(r)=5.89			
Vu=66.45	Vu=-64.08	Vu=-104.77	Vu=-65.76	Vu=-51.62	Vu=-13.87

PROYECTO: I.E EL SUR (IPIALES)

V-222/N: +6.00

B=0.15 H=0.50 L=6.65			B=0.15 H=0.50 L=2.15		
Mu=-22.62 As=2.54 As(r)=2.21	Mu=-60.71 As=3.96 As(r)=3.86	Mu=-28.67 As=3.96 As(r)=2.21	Mu=-2.88 As=0.00 As(r)=2.21		
Mu=16.57 As=2.54 As(r)=2.21		Mu=0.00 As=2.54 As(r)=2.21			
Vu=-18.47	Vu=11.49	Vu=27.19	Vu=-15.21	Vu=-9.76	Vu=-5.23

V-301/N: +9.25

B=0.15 H=0.50 L=5.90			B=0.15 H=0.50 L=9.50			B=0.15 H=0.50 L=9.37		
Mu=-8.90 As=2.54 As(r)=2.21	Mu=-13.88 As=2.54 As(r)=2.21	Mu=-19.43 As=2.54 As(r)=2.21	Mu=-23.45 As=2.54 As(r)=2.21	Mu=-23.61 As=2.54 As(r)=2.21	Mu=-17.99 As=2.54 As(r)=2.21			
Mu=5.87 As=2.54 As(r)=2.21		Mu=12.34 As=2.54 As(r)=2.21		Mu=12.37 As=3.60 As(r)=2.21				
Vu=-7.86	Vu=2.37	Vu=10.17	Vu=-12.83	Vu=0.84	Vu=13.69	Vu=-13.71	Vu=-1.09	Vu=12.47

B=0.15 H=0.50 L=5.25		
Mu=-12.04 As=2.54 As(r)=2.21	Mu=-9.28 As=2.54 As(r)=2.21	
Mu=3.73 As=2.54 As(r)=2.21		
Vu=-9.06	Vu=-2.06	Vu=7.32

V-302/N: +9.25

B=0.15 H=0.50 L=5.90			B=0.15 H=0.50 L=9.50			B=0.15 H=0.50 L=9.37		
Mu=-10.26 As=2.54 As(r)=2.21	Mu=-16.87 As=2.54 As(r)=2.21	Mu=-21.17 As=2.54 As(r)=2.21	Mu=-24.81 As=2.54 As(r)=2.21	Mu=-24.86 As=2.54 As(r)=2.21	Mu=-19.76 As=2.54 As(r)=2.21			
Mu=6.05 As=2.54 As(r)=2.21		Mu=12.05 As=2.54 As(r)=2.21		Mu=12.07 As=3.60 As(r)=2.21				
Vu=-8.34	Vu=3.37	Vu=11.18	Vu=-12.87	Vu=1.05	Vu=13.65	Vu=-13.65	Vu=-1.28	Vu=12.53

B=0.15 H=0.50 L=5.25		
Mu=-16.02 As=2.54 As(r)=2.21	Mu=-10.46 As=2.54 As(r)=2.21	
Mu=4.01 As=2.54 As(r)=2.21		
Vu=-10.49	Vu=-3.49	Vu=7.76

PROYECTO: I.E EL SUR (IPIALES)

V-303/N: + 9.25

B=0.30 H=0.50 L=5.90			B=0.30 H=0.50 L=9.50			B=0.30 H=0.50 L=9.37		
Mu=-54.31 As=5.94 As(r)=4.42			Mu=-47.94 As=5.94 As(r)=4.42			Mu=-59.31 As=5.94 As(r)=4.42		
Mu=13.58 As=5.94 As(r)=4.42			Mu=20.09 As=6.98 As(r)=4.42			Mu=20.36 As=5.94 As(r)=4.42		
Vu=-26.79	Vu=-13.18	Vu=25.87	Vu=-27.02	Vu=-5.63	Vu=25.90	Vu=-26.12	Vu=5.55	Vu=26.66

B=0.30 H=0.50 L=5.25		
Mu=-52.46 As=5.94 As(r)=4.42		
Mu=14.39 As=5.94 As(r)=4.42		
Vu=-27.16	Vu=-15.95	Vu=27.89

V-304/N: + 9.25

B=0.20 H=0.50 L=5.90		
Mu=-40.43 As=3.96 As(r)=2.94		
Mu=76.12 As=5.94 As(r)=4.82		
Vu=-58.32	Vu=-14.61	Vu=57.92

V-305/N: + 9.25

B=0.20 H=0.50 L=5.90		
Mu=-25.47 As=3.96 As(r)=2.94		
Mu=45.89 As=3.96 As(r)=2.94		
Vu=-49.09	Vu=11.03	Vu=49.93

V-306/N: + 9.25

B=0.30 H=0.50 L=5.90			B=0.30 H=0.50 L=9.50			B=0.30 H=0.50 L=9.37		
Mu=-92.86 As=8.55 As(r)=5.80			Mu=-75.39 As=8.55 As(r)=4.66			Mu=-58.15 As=5.94 As(r)=4.42		
Mu=76.12 As=5.94 As(r)=4.71			Mu=18.85 As=6.98 As(r)=4.42			Mu=19.90 As=5.94 As(r)=4.42		
Vu=-71.36	Vu=-27.33	Vu=74.80	Vu=-28.78	Vu=-7.39	Vu=24.43	Vu=-25.79	Vu=6.29	Vu=27.40

PROYECTO: I.E EL SUR (IPIALES)

B=0.30 H=0.50 L=5.25		
Mu=-50.77 As=5.94 As(r)=4.42	Mu=-58.48 As=5.94 As(r)=4.42	
Mu=14.62 As=5.94 As(r)=4.42		
Vu=-27.29	Vu=16.72	Vu=28.92

V-307/N: +9.25

B=0.40 H=0.50 L=6.35			B=0.40 H=0.50 L=2.15		
Mu=-150.43 As=11.72 As(r)=9.52	Mu=-286.68 As=20.28 As(r)=19.52		Mu=-60.53 As=20.28 As(r)=5.89	Mu=-0.70 As=0.00 As(r)=5.89	
Mu=97.42 As=9.66 As(r)=6.39			Mu=0.00 As=9.66 As(r)=5.89		
Vu=110.44	Vu=-34.62	Vu=-128.91	Vu=38.67	Vu=26.43	Vu=7.86

V-308/N: +9.25

B=0.20 H=0.50 L=1.52			B=0.20 H=0.50 L=1.52		
Mu=-24.41 As=3.96 As(r)=2.94	Mu=-10.99 As=3.96 As(r)=2.94		Mu=-0.39 As=3.96 As(r)=2.94	Mu=-0.00 As=2.85 As(r)=2.94	
Mu=28.97 As=3.96 As(r)=2.94			Mu=29.66 As=3.96 As(r)=2.94		
Vu=42.11	Vu=28.03	Vu=13.95	Vu=-8.99	Vu=-18.31	Vu=-27.80

V-309/N: +9.25

B=0.40 H=0.50 L=6.25			B=0.40 H=0.50 L=2.15		
Mu=-181.61 As=13.46 As(r)=11.67	Mu=-304.84 As=27.10 As(r)=20.99		Mu=-126.59 As=27.10 As(r)=7.92	Mu=-0.00 As=0.00 As(r)=5.89	
Mu=105.32 As=12.89 As(r)=6.84			Mu=0.00 As=9.66 As(r)=5.89		
Vu=-128.17	Vu=34.19	Vu=144.03	Vu=78.00	Vu=57.63	Vu=22.56

V-310/N: +9.25

B=0.40 H=0.50 L=6.25			B=0.40 H=0.50 L=2.15		
Mu=-98.34 As=13.46 As(r)=6.08	Mu=-238.06 As=17.90 As(r)=15.76		Mu=-147.88 As=17.90 As(r)=9.35	Mu=-0.00 As=0.00 As(r)=5.89	
Mu=59.52 As=11.15 As(r)=5.89			Mu=0.00 As=7.92 As(r)=5.89		
Vu=-64.63	Vu=48.41	Vu=104.23	Vu=90.19	Vu=67.18	Vu=27.40

PROYECTO: I.E EL SUR (IPIALES)**V-311/N: +9.25**

B=0.40 H=0.50 L=6.25			B=0.40 H=0.50 L=2.15		
Mu=-106.83 As=13.46 As(r)=6.63	Mu=-239.40 As=17.90 As(r)=15.86		Mu=-119.55 As=17.90 As(r)=7.46	Mu=-0.00 As=0.00 As(r)=5.89	
Mu=59.85 As=12.89 As(r)=5.89			Mu=0.00 As=9.66 As(r)=5.89		
Vu=-62.11	Vu=51.31	Vu=100.59	Vu=74.36	Vu=54.95	Vu=21.13

V-312/N: +9.25

B=0.40 H=0.50 L=6.45			B=0.40 H=0.50 L=2.15		
Mu=-94.82 As=9.74 As(r)=5.89	Mu=-197.06 As=15.52 As(r)=12.76		Mu=-57.91 As=15.52 As(r)=5.89	Mu=-0.82 As=0.00 As(r)=5.89	
Mu=49.27 As=9.66 As(r)=5.89			Mu=0.00 As=9.66 As(r)=5.89		
Vu=-47.10	Vu=45.22	Vu=79.43	Vu=37.06	Vu=25.17	Vu=7.32

PROYECTO: I.E EL SUR (IPIALES)

Columnas G-1, G-2

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N:+6.00	2.75	.50	.60	.40	-44.02 90.86	-144.98 16.38	-152.24	51.90	55.35	16/#8 (3.4%) 16/#8 (3.4%)	0.26 0.23	4.17	1.67
N:+6.00	2.75	.50	.60	.40	-166.29 -183.51	-24.65 -32.03	-557.77	98.53	81.28	16/#8 (3.4%) 16/#8 (3.4%)	0.48 0.53	1.84	1.82
N:+2.75	3.78	.50	.60	.40	170.45	64.07	-1011.08	83.00	65.61	16/#8 (3.4%)	0.51	1.30	1.61
N:+0.8		1.00			-183.89	-55.90				16/#8 (3.4%)	0.55		

Columna H-1

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N:+2.75	2.75	.50	.60	.40	-42.99 101.25	-234.95 244.55	-259.07	77.11	147.41	16/#8 (3.4%) 16/#8 (3.4%)	0.42 0.47	1.53	1.24
N:+2.75	3.78	.50	.60	.40	-145.81	-34.83	-777.21	73.96	87.37	16/#8 (3.4%)	0.43	1.33	1.60
N:+0.8		1.00			78.77	296.12				16/#8 (3.4%)	0.59		

Columna H-2

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N:+2.75	2.75	.50	.60	.40	-39.64 31.39	-196.63 -176.25	-138.81	56.21	108.27	16/#7 (2.6%) 16/#7 (2.6%)	0.42 0.37	1.26	2.41
N:+2.75	3.78	.50	.60	.40	-115.97	51.32	-443.83	63.53	93.47	16/#7 (2.6%)	0.40	1.40	3.24
N:+0.8		1.00			72.68	252.44				16/#7 (2.6%)	0.57		

PROYECTO: I.E EL SUR (IPIALES)

Columnas A-1, B-1, B-2

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N:+6.00	2.75	.50	.60	.40	-6.80 -38.73	-257.33 213.66	-298.99	78.09	144.55	16/#8 (3.4%) 16/#8 (3.4%)	0.44 0.38	1.22	1.23
N:+2.75	3.05	.50	.60	.40	177.13	51.36	-642.07	114.95	94.37	16/#8 (3.4%)	0.53	1.27	1.86
N:+0.8		1.00			231.08	-51.39				16/#8 (3.4%)	0.67		

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:+6.00	2.75	.50	.60	.40	193.24 -91.74	150.91 -166.99	-191.43	92.88	121.76	16/#8 (3.4%) 16/#8 (3.4%)	0.54 0.36	1.25	2.50
N:+2.75	3.05	.50	.60	.40	125.24	103.52	-407.40	92.83	91.85	16/#8 (3.4%)	0.38	1.67	3.82
N:+0.8		1.00			204.52	-75.75				16/#8 (3.4%)	0.61		

Columna C-2

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N:+9.25	2.75	.50	.60	.40	97.64 -87.70	161.41 -58.04	-127.72	65.30	78.73	14/#8 (3.0%) 14/#8 (3.0%)	0.37 0.26	2.60	3.07
N:+6.00	2.75	.50	.60	.40	114.42 140.99	5.71 -28.11	-407.40	78.44	83.00	14/#8 (3.0%) 14/#8 (3.0%)	0.35 0.42	2.40	4.63
N:+2.75	3.05	.50	.60	.40	206.61	75.86	-808.88	126.72	102.49	14/#8 (3.0%)	0.67	1.25	2.78
N:+0.8		1.00			243.32	89.01				14/#8 (3.0%)	0.79		

PROYECTO: I.E EL SUR (IPIALES)

Columnas C-1, D-1

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N:+9.25	2.75	.50	.80	.40	19.72	-234.06				20/#8 (3.2%)	0.23	5.38	2.21
					-100.16	12.93	-212.04	62.96	102.67	20/#8 (3.2%)	0.19		
N:+6.00	2.75	.50	.80	.40	146.87	25.13				20/#8 (3.2%)	0.29	1.96	3.27
					198.92	128.67	-511.53	107.96	104.10	20/#8 (3.2%)	0.33		
N:+2.75	3.05	.50	.80	.40	-289.32	-5.11				20/#8 (3.2%)	0.58	1.26	2.18
							-1313.60	174.77	174.23				
N:+0.8		1.00			141.07	578.75				20/#8 (3.2%)	0.64		

Columna D-2

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N:+9.25	2.75	.50	.80	.40	-8.12	194.64				18/#7 (2.2%)	0.25	1.65	3.84
					-44.37	-146.02	-179.19	35.58	99.77	18/#7 (2.2%)	0.20		
N:+6.00	2.75	.50	.80	.40	209.85	124.45				18/#7 (2.2%)	0.43	1.55	5.18
					-167.19	-77.52	-542.79	115.68	108.01	18/#7 (2.2%)	0.36		
N:+2.75	3.05	.50	.80	.40	222.02	155.60				18/#7 (2.2%)	0.47	1.31	3.94
							-870.94	146.90	157.65				
N:+0.8		1.00			-299.61	-61.19				18/#7 (2.2%)	0.75		

Columnas E-1, E-2

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N:+9.25	2.75	.50	.90	.40	-66.43	-15.57				22/#8 (3.1%)	0.10	2.98	3.10
					-34.30	3.49	-157.09	32.24	39.20	22/#8 (3.1%)	0.06		
N:+6.00	2.75	.50	.90	.40	130.89	1.29				22/#8 (3.1%)	0.24	1.28	2.80
					36.33	183.32	-545.58	70.59	114.11	22/#8 (3.1%)	0.16		
N:+2.75	3.05	.50	.90	.40	-173.31	7.86				22/#8 (3.1%)	0.31	1.21	2.51
							-1809.77	126.87	195.72				
N:+0.8		1.00			90.08	644.47				22/#8 (3.1%)	0.55		

PROYECTO: I.E EL SUR (IPIALES)

Columnas F-1, F-2

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N:+9.25	2.75	.50	.80	.40	115.28	-53.56	-223.64	71.97	40.78	20/#8 (3.2%)	0.18	2.68	2.49
					119.36	10.67				20/#8 (3.2%)	0.23		
N:+6.00	2.75	.50	.80	.40	259.51	-51.20	-955.71	151.07	94.51	20/#8 (3.2%)	0.53	1.32	2.54
					232.00	64.79				20/#8 (3.2%)	0.45		
N:+2.75	3.05	.50	.80	.40	265.85	22.98	-1648.21	164.83	225.09	20/#8 (3.2%)	0.55	1.28	2.51
N:+0.8					128.65	747.81				20/#8 (3.2%)	0.80		

6. DISEÑO DE ELEMENTOS COMPLEMENTARIOS

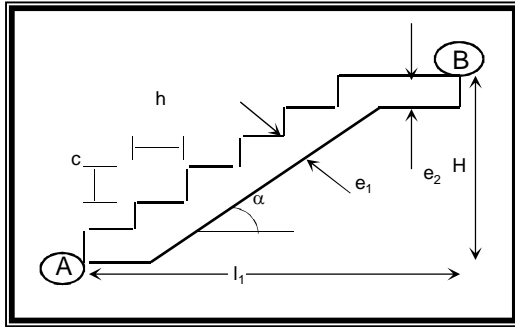
*DISEÑO DE ELEMENTOS
COMPLEMENTARIOS*

PROYECTO: I.E. EL SUR (IPIALES)

DISEÑO DE ESCALERA TIPO

Diseño Tramos Inclinados

El diseño se realiza para el tramo inclinado de la escalera mas largo.



Geometría de la losa

$l_1 =$	4.50 m	$f_y =$	420 MPa
$H =$	1.53 m	$f'_c =$	21.1 MPa
$c =$	17 cm	$h =$	30 cm

Espesor escogido: 15 cm
Pendiente $\alpha = h/l_1 :$ 18.778 °

Cargas

Peso propio de la losa	$0.15 \times 1.00 \times 24 / \cos 25.56^\circ$	3.80	kN/m ²
Peso propio de peldaños	$1/2 \times (0.17 \times 0.3) / 0.3 \times 24$	2.04	kN/m ²
Acabado peldaños	$0.04 \times (0.17 + 0.3) / 0.3 \times 22$	1.38	kN/m ²
Afinado Inferior	$0.02 \times 22 / \cos 21.95^\circ$	0.46	kN/m ²
Sobrecarga		5.00	kN/m ²
		17.22	kN/m²

$$CU = 17.22 \text{ kN/m}^2$$

Diseño Tramo Inclinado

Momentos en tramo A-B.

$$M = 43.60 \text{ kN-m}$$

Cuantía:	0.0080
As	11.93 cm ² /m










$$A_{s\min} = 2.4 \text{ cm}^2/\text{m}$$

Colocar 1#4 c/.14 longitudinalmente

Colocar 1#4 c/.20 transversalmente

PROYECTO: I.E. EL SUR (IPIALES)
DISEÑO PLACA MACIZA ENTREPISO

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

Caso 1	Caso 2	Caso 3	Caso 4	Caso 5	Geometría de la losa la = 3.28 m fy = 420 MPa lb = 4.65 m f'c = 21.1 MPa Relación m = 0.71 Espesor escogido: 0.10 m
					
Caso 6	Caso 7	Caso 8	Caso 9		
					

Teniendo en cuenta que la relación m es mayor de 0.5, la placa maciza trabaja en dos direcciones

Cargas

Peso propio de la losa	0.1x1.0x24	2.40	kN/m ²
Muros divisorios		2.00	kN/m ²
Acabados	0.05x20	1.10	kN/m ²
Carga Muerta Total		5.50	kN/m²
Carga Viva		2.00	kN/m²
Carga Última		9.80	kN/m²

Tipo de soporte CASO N° 2
DISEÑO A MOMENTO FLECTOR

Coefficientes para momento positivo por carga muerta y viva:

$C_{aD} =$	0.028
$C_{bD} =$	0.009
$C_{aV} =$	0.045
$C_{bV} =$	0.014

$M_{ua} =$	2.63	kN.m	Cuantía:	0.0020	$A_s =$	1.40	cm ² /m
$M_{ub} =$	1.68	kN.m	Cuantía:	0.0020	$A_s =$	1.40	cm ² /m

Coefficientes para momento negativo por carga última:

$C_a =$	0.069	$M_{ua} =$	7.27	kN.m	Cuantía:	0.0037	$A_s =$	2.59	cm ² /m
$C_b =$	0.022	$M_{ub} =$	4.66	kN.m	Cuantía:	0.0023	$A_s =$	1.63	cm ² /m

Distribución de refuerzo inferior:

Sentido L_a Malla electrosoldada $\emptyset 6 \text{ mm}$ c/.15 inferior

Sentido L_b Malla electrosoldada $\emptyset 6 \text{ mm}$ c/.15 inferior

Distribución de refuerzo superior:

Sentido L_a Malla electrosoldada $\emptyset 6 \text{ mm}$ c/.15 superior

Sentido L_b Malla electrosoldada $\emptyset 6 \text{ mm}$ c/.15 superior

REVISIÓN A CORTANTE










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

$W_a =$	0.76
$W_b =$	0.24

$\phi v_c =$	0.574	MPa	
$\phi v_{ua} =$	0.173	MPa	OK
$\phi v_{ub} =$	0.039	MPa	OK

PROYECTO: I.E. EL SUR (IPIALES)
DISEÑO PLACA MACIZA CORREDOR

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

Caso 1 	Caso 2 	Caso 3 	Caso 4 	Caso 5 	Geometría de la losa $l_a = 2.00 \text{ m}$ $l_b = 3.75 \text{ m}$ Relación $m = 0.53$ Espesor escogido: 0.10 m
Caso 6 	Caso 7 	Caso 8 	Caso 9 		

Teniendo en cuenta que la relación m es mayor de 0.5, la placa maciza trabaja en dos direcciones

Cargas

Peso propio de la losa	0.1x1.0x24	2.40	kN/m ²
Acabados	0.05x20	1.10	kN/m ²
Carga Muerta Total		3.50	kN/m²
Carga Viva		5.00	kN/m²
Carga Última		12.20	kN/m²

Tipo de soporte CASO N° 2
DISEÑO A MOMENTO FLECTOR

Coefficientes para momento positivo por carga muerta y viva:

$C_{aD} =$	0.035
$C_{bD} =$	0.003
$C_{aV} =$	0.062
$C_{bV} =$	0.006

$M_{ua} =$	1.73	kN.m	Cuantía:	0.0020	$A_s =$	1.40	cm ² /m
$M_{ub} =$	0.57	kN.m	Cuantía:	0.0020	$A_s =$	1.40	cm ² /m

Coefficientes para momento negativo por carga última:

$C_a =$	0.084	$M_{ua} =$	4.10	kN.m	Cuantía:	0.0020	$A_s =$	1.43	cm ² /m
$C_b =$	0.007	$M_{ub} =$	1.20	kN.m	Cuantía:	0.0020	$A_s =$	1.40	cm ² /m

Distribución de refuerzo inferior:

Sentido L_a Malla electrosoldada $\emptyset 6 \text{ mm}$ c/. 15 inferior
Sentido L_b Malla electrosoldada $\emptyset 6 \text{ mm}$ c/. 15 inferior

Distribución de refuerzo superior:

Sentido L_a Malla electrosoldada $\emptyset 6 \text{ mm}$ c/. 15 superior
Sentido L_b Malla electrosoldada $\emptyset 6 \text{ mm}$ c/. 15 superior

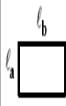




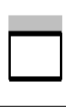



REVISIÓN A CORTANTE

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

$W_a =$	0.92		
$W_b =$	0.08		
$\phi_{VC} =$	0.574	MPa	
$\phi_{Vu_a} =$	0.210	MPa	OK
$\phi_{Vu_b} =$	0.010	MPa	OK

PROYECTO: I.E. EL SUR (IPIALES)
DISEÑO PLACA MACIZA CUBIERTA TANQUE

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

Caso 1	Caso 2	Caso 3	Caso 4	Caso 5	Geometría de la losa
					
					$l_a = 0.90 \text{ m}$ $l_b = 3.75 \text{ m}$ $\text{Relación } m = 0.2$
Caso 6	Caso 7	Caso 8	Caso 9		
					$h = l/20 (0.4 + f_y/700) = 0.05 \text{ m}$ 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/m ²
Acabados	0.05x20	1.10	kN/m ²
Carga Muerta Total		3.50	kN/m²
Carga Viva		5.00	kN/m²
Carga Última		12.20	kN/m²

DISEÑO A MOMENTO FLECTOR

$Mu_a = 1.24 \text{ kN.m}$	$Cuantía: 0.0020$	$As = 1.40 \text{ cm}^2/\text{m}$	Transversal
	$Cuantía: 0.0018$	$As = 1.26 \text{ cm}^2/\text{m}$	Longitudinal

Distribución de refuerzo:

Malla electrosoldada $\emptyset 4 \text{ mm}$ c/.15 Transversal

Malla electrosoldada $\emptyset 4 \text{ mm}$ c/.15 Longitudinal

REVISIÓN A CORTANTE

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

$$R = 5.49 \text{ kN}$$

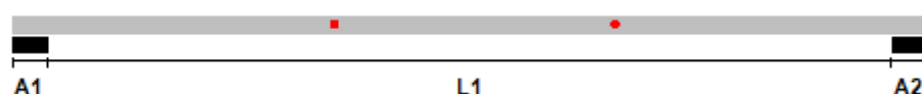
$\phi_{vc} = 0.574 \text{ MPa}$	
$\phi_{vu} = 0.078 \text{ MPa}$	OK

Elementos calculados con el programa de diseño Arquimet 2.0 de ACESCO

REPORTE DE CORREAS

PHR C con atiesador 355 x 110 x 25 (2.00 mm)
con $F_y = 35.15 \text{ Kg/mm}^2$ cada 1.50 m con arriostramiento cada L/3.

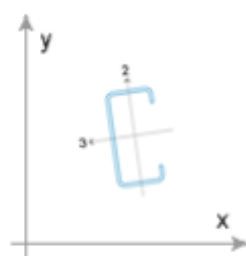
SECCION LONGITUDINAL



L1	9.50 m
A1	0.40 m
A2	0.40 m

CONFIGURACION	
TIPO DE CARGA	DISTRIBUIDA
Carga muerta	0.15 KN/m ²
Peso propio correa	0.09 KN/m
Carga viva	0.50 KN/m ²
Carga granizo	0.50 KN/m ²
Viento compresión (Perpendicular)	0.40 KN/m ²
Viento succión (Perpendicular)	0.40 KN/m ²
Pendiente sección transversal	8.54° = 15.0160%

SECCION TRANSVERSAL



L = 1.50 m



Memorias de Cálculo

PROGRAMA DE DISEÑO Y CALCULO ESTRUCTURAL ARQUIMET 2.0

Proyecto: I. E. EL SUR (IPIALES) Fecha: 16/11/2016

Ingeniero: C.E.D.Q Firma: _____

Elementos calculados con el programa de diseño Arquimet 2.0 de ACESCO

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)	1.1829E-05	9.7683E-08	22.8392	0.2558

REPORTE CORTANTE		
Ejes locales	2	3
Resistente (KN)	21.8826	75.4562
Calculado (KN)	9.1814	0.3741

Memorias de Cálculo

PROGRAMA DE DISEÑO Y CALCULO ESTRUCTURAL ARQUIMET 2.0

Proyecto: I. E. EL SUR (IPIALES) Fecha: 16/11/2016

Ingeniero: C.E.D.Q Firma: _____

Elementos calculados con el programa de diseño Arquimet 2.0 de ACESCO

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

Memorias de Cálculo

PROGRAMA DE DISEÑO Y CALCULO ESTRUCTURAL ARQUIMET 2.0

Proyecto: I. E. EL SUR (IPIALES) Fecha: 16/11/2016

Ingeniero: C.E.D.Q Firma: _____

REACCIONES - EJES GLOBALES (KN-m)

Elementos calculados con el programa de diseño Arquimet 2.0 de ACESCO

APOYO 1		
Combinacion	Rx	Ry
Muerta	-0.1696	1.5494
Viva de Cub.	-0.3998	3.6525
Granizo	-0.3998	3.6525
Viento Comp.	-0.4410	2.9371
Viento Succion	0.4410	-2.9371
Comb. 1	-0.2374	2.1691
Comb. 2	-0.4034	3.6855
Comb. 3	-0.4034	3.6855
Comb. 4	-1.0637	9.1717
Comb. 5	-1.0637	9.1717
Comb. 6	-1.0637	9.1717
Comb. 7	-1.0637	9.1717
Comb. 8	-0.8445	6.6225
Comb. 9	-0.8445	6.6225
Comb. 10	-0.8445	6.6225
Comb. 11	-0.8445	6.6225
Comb. 12	-0.5937	4.3315
Comb. 13	-0.5937	4.3315

APOYO 2		
Combinacion	Rx	Ry
Muerta	-0.1696	1.5494
Viva de Cub.	-0.3998	3.6525
Granizo	-0.3998	3.6525
Viento Comp.	-0.4410	2.9371
Viento Succion	0.4410	-2.9371
Comb. 1	-0.2374	2.1691
Comb. 2	-0.4034	3.6855
Comb. 3	-0.4034	3.6855
Comb. 4	-1.0637	9.1717
Comb. 5	-1.0637	9.1717
Comb. 6	-1.0637	9.1717
Comb. 7	-1.0637	9.1717
Comb. 8	-0.8445	6.6225
Comb. 9	-0.8445	6.6225
Comb. 10	-0.8445	6.6225
Comb. 11	-0.8445	6.6225
Comb. 12	-0.5937	4.3315
Comb. 13	-0.5937	4.3315

Memorias de Cálculo

PROGRAMA DE DISEÑO Y CÁLCULO ESTRUCTURAL ARQUIMET 2.0

Proyecto: I. E. EL SUR (IPIALES) Fecha: 16/11/2016

Ingeniero: C.E.D.Q Firma: _____

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	0.0624	1.5574	4.7884E-09	7.6614E-08
Viva de Cub.	0.1470	3.6713	1.9154E-08	-6.2058E-06
Granizo	0.1470	3.6713	1.9154E-08	-6.2058E-06
Viento Comp.	0.0000	2.9700	0.0000	-3.2178E-06
Viento Succion	0.0000	2.9700	0.0000	-3.2178E-06
Comb. 1	0.0873	2.1803	6.7038E-09	1.0726E-07
Comb. 2	0.1483	3.7045	1.5323E-08	-3.0109E-06
Comb. 3	0.1483	3.7045	1.5323E-08	-3.0109E-06
Comb. 4	0.3101	9.2280	3.6392E-08	-1.1446E-05
Comb. 5	0.3101	9.2280	3.6392E-08	-1.1446E-05
Comb. 6	0.3101	9.2280	3.6392E-08	-1.1446E-05
Comb. 7	0.3101	9.2280	3.6392E-08	-1.1446E-05
Comb. 8	0.1483	6.6745	1.5323E-08	-6.2288E-06
Comb. 9	0.1483	6.6745	1.5323E-08	-6.2288E-06
Comb. 10	0.1483	6.6745	1.5323E-08	-6.2288E-06
Comb. 11	0.1483	6.6745	1.5323E-08	-6.2288E-06
Comb. 12	0.0561	4.3716	4.3096E-09	-3.1489E-06
Comb. 13	0.0561	4.3716	4.3096E-09	-3.1489E-06

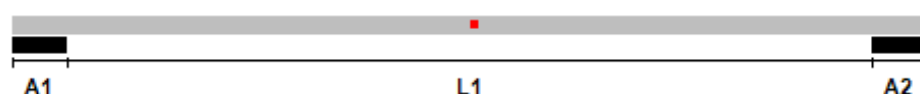
APOYO 2				
Combinacion	R2	R3	M2	M3
Muerta	0.0624	1.5574	-4.7884E-09	-9.1937E-07
Viva de Cub.	0.1470	3.6713	-5.7461E-08	-6.1292E-07
Granizo	0.1470	3.6713	-5.7461E-08	-6.1292E-07
Viento Comp.	0.0000	2.9700	0.0000	-1.0420E-05
Viento Succion	0.0000	2.9700	0.0000	-1.0420E-05
Comb. 1	0.0873	2.1803	-6.7038E-09	-1.2871E-06
Comb. 2	0.1483	3.7045	-3.4477E-08	-1.4097E-06
Comb. 3	0.1483	3.7045	-3.4477E-08	-1.4097E-06
Comb. 4	0.3101	9.2280	-9.7683E-08	-7.2937E-06
Comb. 5	0.3101	9.2280	-9.7683E-08	-7.2937E-06
Comb. 6	0.3101	9.2280	-9.7683E-08	-7.2937E-06
Comb. 7	0.3101	9.2280	-9.7683E-08	-7.2937E-06
Comb. 8	0.1483	6.6745	-3.4477E-08	-1.1829E-05
Comb. 9	0.1483	6.6745	-3.4477E-08	-1.1829E-05
Comb. 10	0.1483	6.6745	-3.4477E-08	-1.1829E-05
Comb. 11	0.1483	6.6745	-3.4477E-08	-1.1829E-05
Comb. 12	0.0561	4.3716	-4.3096E-09	-1.1247E-05
Comb. 13	0.0561	4.3716	-4.3096E-09	-1.1247E-05

Elementos calculados con el programa de diseño Arquimet 2.0 de ACESCO

REPORTE DE CORREAS

PHR C con atiesador 355 x 110 x 25 (2.00 mm)
con $F_y = 35.15 \text{ Kg/mm}^2$ cada 1.50 m con arriostramiento cada $L/2$.

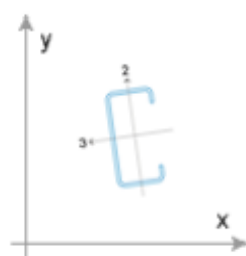
SECCION LONGITUDINAL



L1	5.90 m
A1	0.40 m
A2	0.40 m

CONFIGURACION	
TIPO DE CARGA	DISTRIBUIDA
Carga muerta	0.15 KN/m ²
Peso propio correa	0.09 KN/m
Carga viva	0.50 KN/m ²
Carga granizo	0.50 KN/m ²
Viento compresión (Perpendicular)	0.40 KN/m ²
Viento succión (Perpendicular)	0.40 KN/m ²
Pendiente sección transversal	8.54° = 15.0160%

SECCION TRANSVERSAL



$L = 1.50 \text{ m}$



Memorias de Cálculo

PROGRAMA DE DISEÑO Y CALCULO ESTRUCTURAL ARQUIMET 2.0

Proyecto: I. E. EL SUR (IPIALES) Fecha: 16/11/2016

Ingeniero: C.E.D.Q Firma: _____

Elementos calculados con el programa de diseño Arquimet 2.0 de ACESCO

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)	1.3791E-06	1.5323E-08	9.2490	0.2913

REPORTE CORTANTE		
Ejes locales	2	3
Resistente (KN)	21.8826	75.4562
Calculado (KN)	5.8257	0.3758

Memorias de Cálculo

PROGRAMA DE DISEÑO Y CALCULO ESTRUCTURAL ARQUIMET 2.0

Proyecto: I. E. EL SUR (IPIALES) Fecha: 16/11/2016

Ingeniero: C.E.D.Q Firma: _____

Elementos calculados con el programa de diseño Arquimet 2.0 de ACESCO

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

Memorias de Cálculo

PROGRAMA DE DISEÑO Y CÁLCULO ESTRUCTURAL ARQUIMET 2.0

Proyecto: I. E. EL SUR (IPIALES) Fecha: 16/11/2016

Ingeniero: C.E.D.Q Firma: _____

REACCIONES - EJES GLOBALES (KN-m)

Elementos calculados con el programa de diseño Arquimet 2.0 de ACESCO

APOYO 1		
Combinacion	Rx	Ry
Muerta	-0.0920	0.9883
Viva de Cub.	-0.2168	2.3299
Granizo	-0.2168	2.3299
Viento Comp.	-0.2807	1.8690
Viento Succion	0.2807	-1.8690
Comb. 1	-0.1288	1.3837
Comb. 2	-0.2188	2.3510
Comb. 3	-0.2188	2.3510
Comb. 4	-0.5977	5.8484
Comb. 5	-0.5977	5.8484
Comb. 6	-0.5977	5.8484
Comb. 7	-0.5977	5.8484
Comb. 8	-0.4995	4.2200
Comb. 9	-0.4995	4.2200
Comb. 10	-0.4995	4.2200
Comb. 11	-0.4995	4.2200
Comb. 12	-0.3634	2.7586
Comb. 13	-0.3634	2.7586

APOYO 2		
Combinacion	Rx	Ry
Muerta	-0.0920	0.9883
Viva de Cub.	-0.2168	2.3299
Granizo	-0.2168	2.3299
Viento Comp.	-0.2807	1.8690
Viento Succion	0.2807	-1.8690
Comb. 1	-0.1288	1.3837
Comb. 2	-0.2188	2.3510
Comb. 3	-0.2188	2.3510
Comb. 4	-0.5977	5.8484
Comb. 5	-0.5977	5.8484
Comb. 6	-0.5977	5.8484
Comb. 7	-0.5977	5.8484
Comb. 8	-0.4995	4.2200
Comb. 9	-0.4995	4.2200
Comb. 10	-0.4995	4.2200
Comb. 11	-0.4995	4.2200
Comb. 12	-0.3634	2.7586
Comb. 13	-0.3634	2.7586

Memorias de Cálculo

PROGRAMA DE DISEÑO Y CÁLCULO ESTRUCTURAL ARQUIMET 2.0

Proyecto: I. E. EL SUR (IPIALES) Fecha: 16/11/2016

Ingeniero: C.E.D.Q Firma: _____

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	0.0558	0.9911	0.0000	-1.9154E-08
Viva de Cub.	0.1316	2.3363	-9.5768E-09	-2.6815E-07
Granizo	0.1316	2.3363	-9.5768E-09	-2.6815E-07
Viento Comp.	0.0000	1.8900	0.0000	7.6614E-08
Viento Succion	0.0000	1.8900	0.0000	7.6614E-08
Comb. 1	0.0781	1.3875	0.0000	-2.6815E-08
Comb. 2	0.1328	2.3574	-4.7884E-09	-1.5706E-07
Comb. 3	0.1328	2.3574	-4.7884E-09	-1.5706E-07
Comb. 4	0.2775	5.8723	-1.5323E-08	-4.1372E-07
Comb. 5	0.2775	5.8723	-1.5323E-08	-4.1372E-07
Comb. 6	0.2775	5.8723	-1.5323E-08	-4.1372E-07
Comb. 7	0.2775	5.8723	-1.5323E-08	-4.1372E-07
Comb. 8	0.1328	4.2474	-4.7884E-09	-8.0445E-08
Comb. 9	0.1328	4.2474	-4.7884E-09	-8.0445E-08
Comb. 10	0.1328	4.2474	-4.7884E-09	-8.0445E-08
Comb. 11	0.1328	4.2474	-4.7884E-09	-8.0445E-08
Comb. 12	0.0502	2.7819	0.0000	5.9376E-08
Comb. 13	0.0502	2.7819	0.0000	5.9376E-08

APOYO 2				
Combinacion	R2	R3	M2	M3
Muerta	0.0558	0.9911	9.5768E-09	6.1292E-07
Viva de Cub.	0.1316	2.3363	0.0000	3.0646E-07
Granizo	0.1316	2.3363	0.0000	3.0646E-07
Viento Comp.	0.0000	1.8900	0.0000	3.0646E-07
Viento Succion	0.0000	1.8900	0.0000	3.0646E-07
Comb. 1	0.0781	1.3875	1.3408E-08	8.5808E-07
Comb. 2	0.1328	2.3574	1.1492E-08	8.8873E-07
Comb. 3	0.1328	2.3574	1.1492E-08	8.8873E-07
Comb. 4	0.2775	5.8723	1.1492E-08	1.3791E-06
Comb. 5	0.2775	5.8723	1.1492E-08	1.3791E-06
Comb. 6	0.2775	5.8723	1.1492E-08	1.3791E-06
Comb. 7	0.2775	5.8723	1.1492E-08	1.3791E-06
Comb. 8	0.1328	4.2474	1.1492E-08	1.1952E-06
Comb. 9	0.1328	4.2474	1.1492E-08	1.1952E-06
Comb. 10	0.1328	4.2474	1.1492E-08	1.1952E-06
Comb. 11	0.1328	4.2474	1.1492E-08	1.1952E-06
Comb. 12	0.0502	2.7819	8.6191E-09	8.5808E-07
Comb. 13	0.0502	2.7819	8.6191E-09	8.5808E-07

PROYECTO: I.E. EL SUR (IPIALES)
DISEÑO MIEMBROS ENSAMBLADOS
PHR A CONCRETO

MATERIALES

A-36
 $f_y = 252 \text{ N/mm}^2$
 $F_u = 400 \text{ N/mm}^2$

CARGAS

$V = 9.18 \text{ KN}$

Pernos $\phi = 6.35 \text{ mm}$
Agujeros $\phi = 9.5 \text{ mm}$

Espesor platina = 6.35 mm

DATOS DEL ELEMENTO

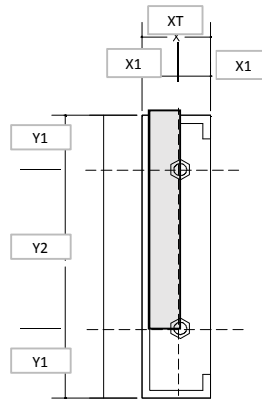
$X1 = 55 \text{ mm}$
 $X2 = 55 \text{ mm}$
 $t = 0 \text{ mm}$
 $XT = 110 \text{ mm}$

$Y1 = 35 \text{ mm}$
 $Y2 = 285 \text{ mm}$
 $Y1 = 35 \text{ mm}$

$YT = 355 \text{ mm}$

$A_g = 2254.25 \text{ mm}^2$

$A_e = 2104 \text{ mm}^2$



FLUENCIA EN LA SECCIÓN BRUTA

Se debe cumplir:

$$P_u < 0.90 F_y A_g$$

$$P_u < 511 \text{ kN} \quad \text{OK}$$

$$A_{g \text{ Diseño}} = 41 \text{ mm}^2 \quad \text{OK}$$

FRACTURA EN LA SECCIÓN EFECTIVA

Se debe cumplir:

$$P_u < 0.75 F_u A_e$$

$$P_u < 631 \text{ kN} \quad \text{OK}$$

$$A_{e \text{ Diseño}} = 31 \text{ mm}^2 \quad \text{OK}$$

Resistencia al desgarre de un bloque por tensión y cortante

$A_{nv} = 2104 \text{ mm}^2$
 $A_{nt} = 320 \text{ mm}^2$
 $F_u A_{nt} = 128 \text{ KN}$
 $0.6 F_u A_{nv} = 505 \text{ KN}$

Para el análisis se supone riesgo de falla por bloque, con base en dos estados limites definidos así:

Si $F_u A_{nt} > 0.6 F_u A_{nv}$ entonces; $P_u = \Phi [0.6 F_y A_{gv} + F_u A_{nt}]$

Si $0.6 F_u A_{nv} > F_u A_{nt}$ entonces; $P_u = \Phi [0.6 F_u A_{nv} + F_y A_{gt}]$

Fractura de la sección neta a corte, combinada con fluencia de la sección bruta a tensión.

$A_{gv} = 2254.25 \text{ mm}^2$
 $A_{gt} = 349.25 \text{ mm}^2$

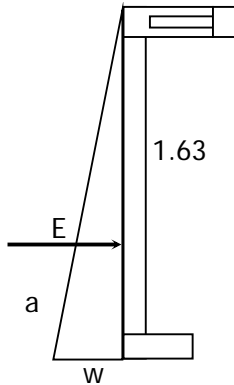
Por lo tanto,

$P_u = 445 \text{ kN} \quad \text{OK}$

PROYECTO: I.E. EL SUR (IPIALES)

DISEÑO MURO DE CONTENCIÓN TIPO1

Para efectos de diseño se tendrá en cuenta que el muro se encuentra apoyado en la viga de cimentación y en la placa del nivel NA ±0.00 de la edificación.



$$E = \frac{1}{2} \times \gamma_s \times k_a \times h^2$$

$$\begin{aligned} \gamma_s &= 17.0 \text{ kN/m}^3 \\ K_o &= 0.52 \\ h &= 1.63 \text{ m} \\ w &= 14.37 \text{ kN/m} \end{aligned}$$

$$\begin{aligned} f'_c &= 21.1 \text{ MPa} \\ f_y &= 420.0 \text{ MPa} \end{aligned}$$

$$E = 11.69 \text{ kN} \quad a = h/3 = 0.54 \text{ m}$$

$$M_{\max} = 2.53 \text{ kN.m}$$

$$M_u = 3.80 \text{ kN.m}$$

b(cm)	e(cm)	d(cm)
1.00	0.20	0.16

Cuantía=

0.000355

As=

0.57 cm²/m

Coloque 1#4 c/.20 en cada cara como refuerzo mínimo.
Refuerzo transversal 1#4 c/.20

REVISIÓN A CORTANTE

$$V_u = 11.69 \text{ kN}$$

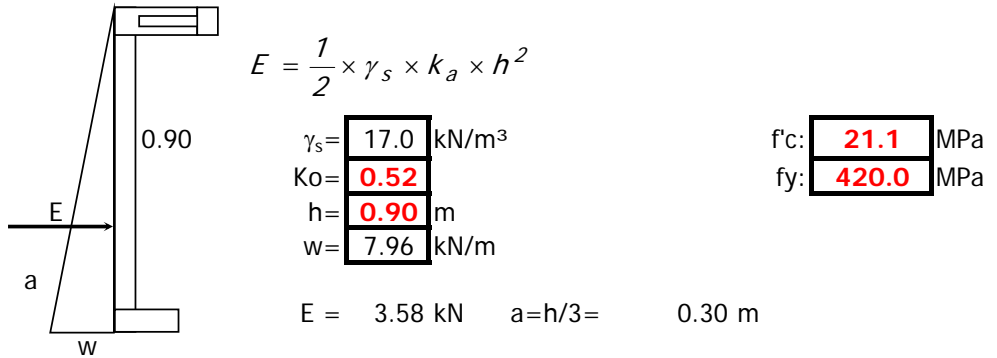
$$\phi v_c = 0.574 \text{ MPa}$$

$$\phi v_u = 0.073 \text{ MPa} \quad \text{OK}$$

PROYECTO: I.E. EL SUR (IPIALES)

DISEÑO DE MUROS DE CONTENCIÓN TIPO 2

Para efectos de diseño se tendrá en cuenta que el muro se encuentra apoyado en la viga de cimentación y en la placa del nivel NA ±0.00 de la edificación.



$M_{max} = 0.43$ kN.m $M_u = 0.64$ kN.m

b(cm)	e(cm)	d(cm)
1.00	0.20	0.16

Cuantía = 0.000060 $A_s = 0.10$ cm²/m

Coloque 1#4 c/.20 en cada cara como refuerzo mínimo.
Refuerzo transversal 1#4 c/.20

REVISIÓN A CORTANTE

$V_u = 3.58$ kN
 $\phi_{vc} = 0.574$ MPa
 $\phi_{vu} = 0.022$ MPa OK

PROYECTO: I.E. EL SUR (IPIALES)

CÁLCULO DE DEFLEXIONES

V-102 EJES D-E

VIGA CON APOYOS CONTINUOS

Las deflexiones inmediatas se calcularán por las fórmulas de la teoría de la elasticidad considerando los efectos que tienen la fisuración y el refuerzo sobre la rigidez de la viga; las deflexiones adicionales deben determinarse multiplicando las deflexiones inmediatas causadas por la carga muerta por el factor λ de la NSR-10 Título C.9.5.2.5. En luces continuas el momento de inercia efectivo debe tomarse como el promedio de los valores del momento de inercia efectivo para la sección crítica del momento positivo y la sección crítica de momento negativo.

MOMENTO POSITIVO

$f_c =$	21.1	MPa	$h =$	50	cm
$f_y =$	420	MPa	$d =$	45	cm
			$b =$	40	cm
	$A_s =$	2568	mm ²		25.68 cm ²
	$n =$	9.3			
	$A_s' =$	1020	mm ²		10.20 cm ²

DETERMINACIÓN DE LA PROFUNDIDAD DEL EJE NEUTRO

$$\frac{bx^2}{2} + (2n-1)A_s'(x - d') = nA_s(d - x)$$

Donde:

n	Relación de módulos de elasticidad entre acero/concreto
b	Base de la sección
d	Altura efectiva de la sección
d'	Recubrimiento del refuerzo superior
x	Profundidad del eje neutro
A_s'	Área del acero a compresión (mm ²)
A_s	Área del acero a tracción (mm ²)

Luego:

n	9.3		
A_s'	1020	mm ²	$(2n-1)A_s' =$ 17878.23 mm ²
A_s	2568	mm ²	$nA_s =$ 23789.53 mm ²
d'	50	mm	5 cm

Profundidad del eje neutro:

$$x = 159.8 \text{ mm} \quad 15.98 \text{ cm}$$

MOMENTO DE INERCIA DE LA SECCION TRANSFORMADA FISURADA

PROYECTO: I.E. EL SUR (IPIALES) CÁLCULO DE DEFLEXIONES V-102 EJES D-E

$$\frac{bx^3}{3} + (2n-1)As'(x-d')^2 + nAs(d-x)^2$$

$I_{cr} = 276310.00 \text{ cm}^4$ 0.00276 m^4

MOMENTO DE INERCIA SECCIÓN TOTAL DE CONCRETO

$I_g = 416666.67 \text{ cm}^4$ 0.00417 m^4
 $Y_t = 34.02 \text{ cm}$

$M_{cr} = \frac{fr I_g}{Y_t}$ $fr = 0.7 \sqrt{f'_c}$

$M_{cr} = 39.39 \text{ kN-m}$

Ma = Momento máximo presente en la viga

Ma = 298.8 kN-m

$$I_e = \left\{ \frac{M_{cr}}{Ma} \right\}^3 * I_g + \left\{ 1 - \left\{ \frac{M_{cr}}{Ma} \right\}^3 \right\} * I_{cr}$$

$I_e = 276631.5 \text{ cm}^4$ 27.663 OK

MOMENTO NEGATIVO

$f'_c = 21.1 \text{ MPa}$ $h = 50 \text{ cm}$
 $f_y = 420 \text{ MPa}$ $d = 45 \text{ cm}$
 $b = 40 \text{ cm}$

$As = 2322 \text{ mm}^2$ 23.22 cm^2
 $n = 9.3$
 $As' = 3588 \text{ mm}^2$ 35.88 cm^2

DETERMINACIÓN DE LA PROFUNDIDAD DEL EJE NEUTRO

$$\frac{bx^2}{2} + (2n-1)As'(x-d') = nAs(d-x)$$

Donde:

n Relación de módulos de elasticidad entre acero/concreto
b Base de la sección
d Altura efectiva de la sección

PROYECTO: I.E. EL SUR (IPIALES) CÁLCULO DE DEFLEXIONES

V-102 EJES D-E

d'	Recubrimiento del refuerzo superior
x	Profundidad del eje neutro
As'	Área del acero a compresión (mm ²)
As	Área del acero a tracción (mm ²)

Luego:

n	9.3		
As'	3588 mm ²	(2n-1)A's =	62889.30 mm ²
As	2322 mm ²	nAs =	21510.63 mm ²
d'	50 mm		5 cm

Profundidad del eje neutro:

$$x = 118.0 \text{ mm} \quad 11.80 \text{ cm}$$

MOMENTO DE INERCIA DE LA SECCION TRANSFORMADA FISURADA

$$\frac{bx^3}{3} + (2n-1)As'(x-d')^2 + nAs(d-x)^2$$

$$I_{cr} = 288086.60 \text{ cm}^4 \quad 0.00288 \text{ m}^4$$

MOMENTO DE INERCIA SECCIÓN TOTAL DE CONCRETO

$$I_g = 416666.67 \text{ cm}^4 \quad 0.00417 \text{ m}^4$$

$$Y_t = 38.20 \text{ cm}$$

$$M_{cr} = \frac{f_r I_g}{Y_t} \quad f_r = 0.7 \sqrt{f'_c}$$

$$M_{cr} = 35.07 \text{ kN-m}$$

Ma = Momento máximo presente en la viga

$$M_a = 437.4 \text{ kN-m}$$

$$I_e = \left\{ \frac{M_{cr}}{M_a} \right\}^3 * I_g + \left\{ 1 - \left\{ \frac{M_{cr}}{M_a} \right\}^3 \right\} * I_{cr}$$

$$I_e = 288152.8 \text{ cm}^4 \quad 28.815 \text{ OK}$$

Según el numeral C.9.5.2.3. la inercia efectiva es igual al promedio de las secciones críticas:

$$I_e = 282392.18 \text{ cm}^4 \quad 28.239 \text{ m}^4$$

DEFLEXIÓN ELÁSTICA INMEDIATA

PROYECTO: I.E. EL SUR (IPIALES)

CÁLCULO DE DEFLEXIONES

V-102 EJES D-E

$$\delta = \frac{5 w l^4}{384 E I_g}$$

Donde:

δ Deflexión elástica inmediata
 w Carga por metro lineal
 l Longitud de la viga
 E Módulo de elasticidad del concreto
 I_g Momento de la sección total

Luego:

w **12.10 kN/m**
 E **21589 MPa**

$$\delta = 0.0143 \text{ m}$$

DEFLEXIÓN INMEDIATA POR :

CARGA MUERTA 80%	0.011 m	1.141 mm
CARGA VIVA 20%	0.003 m	0.257 mm

DEFLEXIÓN ADICIONAL LARGO PLAZO (5 AÑOS O MAS)

La deflexión adicional a largo plazo causada por la retracción de fraguado y el flujo plástico, se determinará multiplicando la deflexión causada por la carga muerta por el factor λ .

$$\lambda = \frac{\xi}{1 + 50 \rho'}$$

Donde:

ξ Coeficientes de efectos de largo plazo. Según NSR- 10 Título C.9.5.2.5
 ρ' Cuantía del refuerzo a compresión

Luego:

ξ 2.0
 ρ' 0.00680

$$\lambda = 1.493$$

$$\delta = 0.0158 \text{ m}$$

COMPARACION CON TABLA C.9-2 NSR 98
 DEFLEXIONES MAXIMAS CALCULADAS PERMISIBLES

	$L =$	9.50 m	
DEFLEXION LIMITE	$L/480$	0.0198 m	
DEFLEXION LARGO PLAZO		0.0184 m	OK

7. DISEÑO DE ELEMENTOS NO ESTRUCTURALES

*DISEÑO DE ELEMENTOS NO
ESTRUCTURALES*

PROYECTO: I.E. EL SUR (PIALES)
DISEÑO DE ELEMENTOS NO ESTRUCTURALES

Units: kN*m

STORY DATA

Story	Height	Elevation	SimilarTo
N:+9.25	3.25	9.20	None
N:+6.00	3.25	5.95	None
N:+2.75	3.55	2.70	None
N:+0.8	0.73	-0.85	None
BASE	0.00	-1.58	None

CENTER MASS RIGIDITY

Story	Diaphragm	MassX	MassY	XCM	YCM	CumMassX	CumMassY
N:+9.25	D1	89.4224	89.4224	34.124	5.411	89.4224	89.4224
N:+6.00	D1	299.5477	299.5477	30.879	5.41	388.9701	388.9701
N:+2.75	D1	430.3735	430.3735	29.841	5.364	819.3436	819.3436

XCCM	YCCM	XCR	YCR
34.124	5.411	33.002	4.874
31.625	5.41	31.209	4.885
30.688	5.386	30.616	4.698

STORY SHEARS

Story	Load	Loc	P	VX	VY	T	MX	MY
N:+9.25	SISDISX	Top	0	290.98	7.09	1936.509	0	0
N:+9.25	SISDISX	Bottom	0	290.98	7.09	1936.509	23.034	945.694
N:+9.25	SISDISY	Top	0	6.54	357.36	13167.705	0	0
N:+9.25	SISDISY	Bottom	0	6.54	357.36	13167.705	1161.413	21.262
N:+6.00	SISDISX	Top	0	991.67	12.43	6573.92	23.034	945.694
N:+6.00	SISDISX	Bottom	0	991.67	12.43	6573.92	58.557	4129.919
N:+6.00	SISDISY	Top	0	18	1078.89	39092.616	1161.413	21.262
N:+6.00	SISDISY	Bottom	0	18	1078.89	39092.616	4613.947	71.398
N:+2.75	SISDISX	Top	0	1549.89	20.3	10328.796	58.557	4129.919
N:+2.75	SISDISX	Bottom	0	1549.89	20.3	10328.796	111.029	9535.124
N:+2.75	SISDISY	Top	0	22.78	1548.6	56487.108	4613.947	71.398
N:+2.75	SISDISY	Bottom	0	22.78	1548.6	56487.108	10013.539	120.411

$$F_p = \frac{a_x a_p}{R_p} g M_p \geq \frac{A_a I}{2} g M_p$$

$$a_x = \frac{C_{vx} V_s}{m_x g} \leq 2 S_a$$

$$C_{vx} = \frac{m_x h_x^k}{\sum_{i=1}^n (m_i h_i^k)}$$

g: 9.81 m/s^2
Sa: 0.560 s

$$V_s = S_a g M$$

Grupo de uso: III
Grado de desempeño: SUPERIOR

Grupo de Uso	Grado de desempeño
IV	SUPERIOR
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:	0.01	m
Densidad de mamposteria:	13.00	kN/m3
Densidad mortero de pañete:	21.00	kN/m3
Altura Fachada:	3.90	m
Carga	8.424	kN/m
Descripción:	mamposteria reforzada, separada lateralmente de la estructura, apoyada arriba y abajo	
ap:	1.0	
Rp:	6	

PROYECTO: I.E. EL SUR (PIALES)
DISEÑO DE ELEMENTOS NO ESTRUCTURALES

ANALISIS DE CARGAS PARA ANTEPECHOS

Epesor de muros:	0.15	m
Epesor de pañete en una cara:	0.01	m
Densidad de mamposteria:	13.00	kN/m3
Densidad mortero de pañete:	21.00	kN/m3
Altura Antepecho:	1.00	m
Carga	2.16	kN/m
Descripción:	mamposteria reforzada, separada lateralmente de la estructura, apoyada solo abajo	
ap:	2.5	
Rp:	6	
Sección de vigas verticales:	0.12x0.25	m
f'c =	21.1	MPa
fy =	420	MPa

DISEÑO PARA MUROS

Story	Fx	Wx	ax	ap	Rp	Fp	M	V
N:+9.25	290.98	877.23	0.33	1.00	6.00	0.47	0.89	0.91
N:+6.00	290.98	2938.56	0.10	1.00	6.00	0.14	0.26	0.27
N:+2.75	6.54	4221.96	0.00	1.00	6.00	0.00	0.00	0.00
Sección Vigas V.			As. (cm2)			Separación column.		Fl. 1/4"
Story	b	d	ρ	neces.	ubicado	S max	S escogida	S estribos
N:+9.25	0.12	0.21	0.00040	0.10	0.71	7.04	7.00	0.188
N:+6.00	0.12	0.21	0.00012	0.03	0.71	23.66	23.70	0.188
N:+2.75	0.12	0.21	0.00000	0.00	0.71	1514.43	1514.40	0.188

DISEÑO PARA ANTEPECHOS

Story	Fx	Wx	ax	ap	Rp	Fp	M	V
N:+9.25	290.98	877.23	0.33	2.50	6.00	0.299	0.57	0.58
N:+6.00	290.98	2938.56	0.10	2.50	6.00	0.089	0.17	0.17
N:+2.75	6.54	4221.96	0.00	2.50	6.00	0.001	0.00	0.00
Sección columneta			As. (cm2)			Separación column.		Fl. 1/4"
Story	b	d	ρ	neces.	ubicado	S max	S escogida	S estribos
N:+9.25	0.12	0.21	0.00026	0.06	0.71	11.00	11.00	0.188
N:+6.00	0.12	0.21	0.00008	0.02	0.71	36.93	36.90	0.188
N:+2.75	0.12	0.21	0.00000	0.00	0.71	2362.52	2362.50	0.188

DISEÑO DE ANCLAJES PARA MUROS

Story	M	V	b	e	P	ϕ varilla	P resistente	REVISIÓN
N:+9.25	0.89	0.91	0.12	0.21	4.22	0.71	44.91	OK
N:+6.00	0.26	0.27	0.12	0.21	1.26	0.71	44.91	OK
N:+2.75	0.00	0.00	0.12	0.21	0.02	0.71	44.91	OK

DISEÑO DE ANCLAJES PARA ANTEPECHOS

Story	M	V	b	e	P	ϕ varilla	P resistente	REVISIÓN
N:+9.25	0.568	0.582	0.12	0.21	2.70	0.71	74.04	OK
N:+6.00	0.169	0.174	0.12	0.21	0.81	0.71	74.04	OK
N:+2.75	0.003	0.003	0.12	0.21	0.01	0.71	74.04	OK

RESISTENCIA ULTIMA A TRACCION PARA VARILLAS DE REFUERZO GRADO 60
Instalados en Concreto de 27.6 Mpa, 4000 psi

ϕ Varilla	ϕ Broca	Empotramiento (Pulg/mm)	# Huecos X Cartucho G522	Ultima Resistencia Kgs/Lbs	DATOS DE RESISTENCIA ULTIMA DE ELONGACION Y ROTURA PARA VARILLAS GRADO 60			
					Carga Minima para Elongacion Kgs/Lbs		Carga Minima para Rotura Kgs/Lbs	
# 3 (9.5 mm)	1/2"	3 3/8" 85.7	117.4	4936 10881	2994 6600	4490 9900		
# 3	1/2"	4 1/2" 114.3	87.5	4719 10404				
# 4 (12.7 mm)	5/8"	4 1/2" 114.3	66	8818 19441	5443 12000	8164 18000		
# 4	5/8"	6" 152.4	49	8972 19780				
# 5 (15.9 mm)	3/4"	5 5/8" 142.9	40.4	12810 28240	11975 18600	12655 27900		
# 5	3/4"	7 1/2" 190.5	30.2	15822 34880				
# 6 (19.1 mm)	7/8"	6 3/4" 171.5	27.1	17658 28929	11975 26400	17962 39600		

PROYECTO: I.E. EL SUR (PIALES)

DISEÑO DE ELEMENTOS NO ESTRUCTURALES

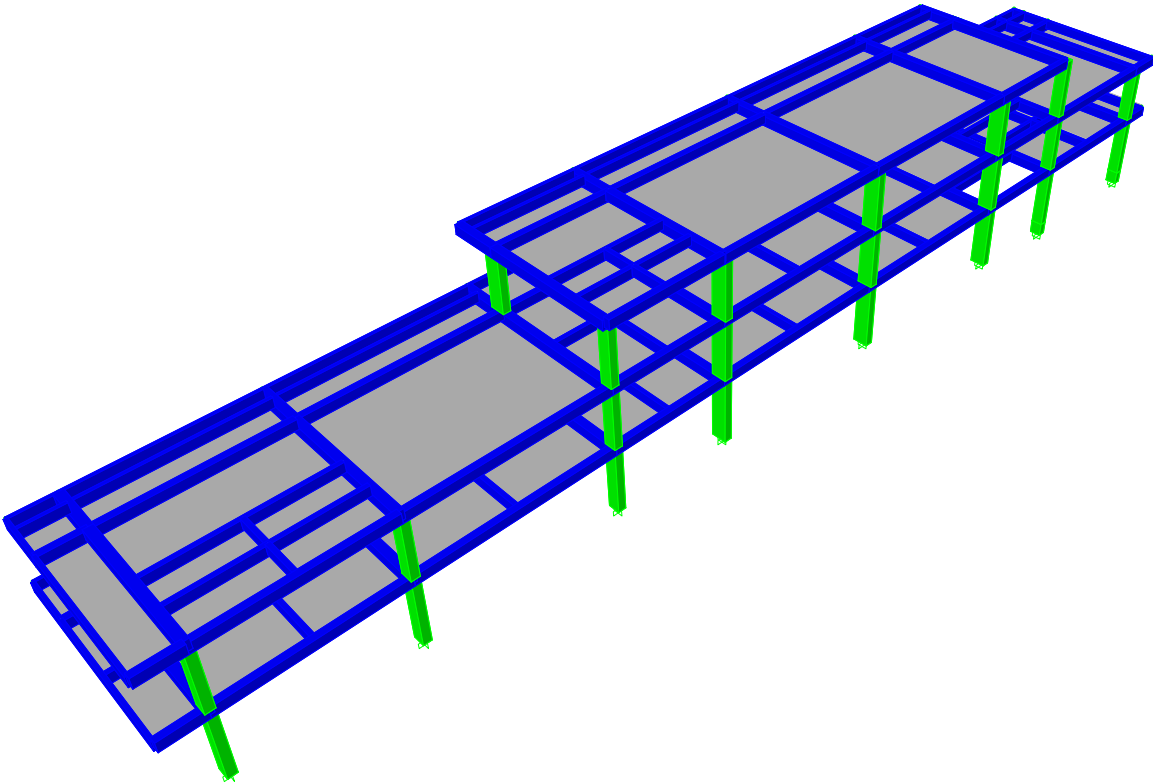
# 6	7/8"	9"	228.6	20.2	20661	45550				
# 7 (22.2	1 1/8"	7 7/8"	200	11.1	23430	51653	16330	36000	24494	54000
# 7	1 1/8"	10 1/2"	266.7	8	27774	61230				
# 8 (25.4mm	1 1/4"	9"	228.6	8.6	29202	64378	21500	47400	32251	71100
# 8	1 1/4"	12"	304.8	6.5	34886	76910				

NOTA:

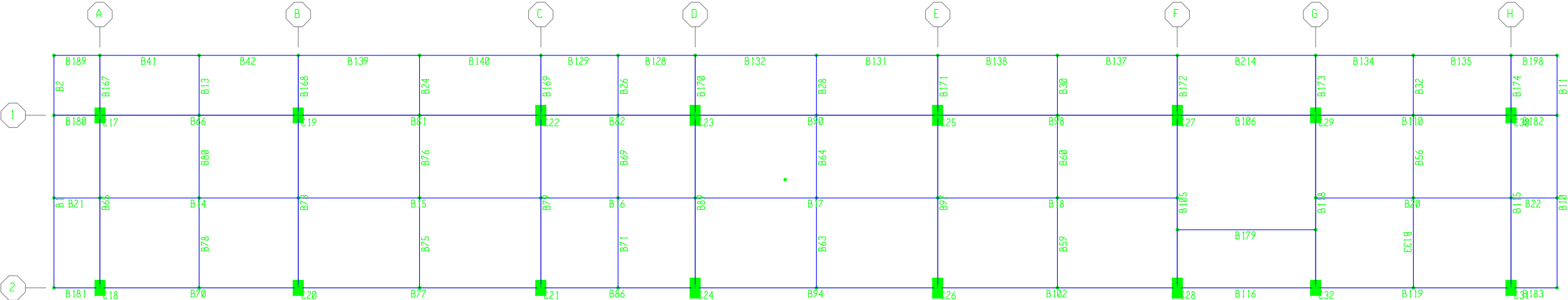
1. Cargas de trabajo estático no deben exceder el 25% de la resistencia última publicada aquí.
2. Con empotramiento de nueve veces el diámetro de la varilla se supera el punto de enlongación de las varillas y con 12 empotramientos se alcanza el punto de rotura en la mayoría de los casos.

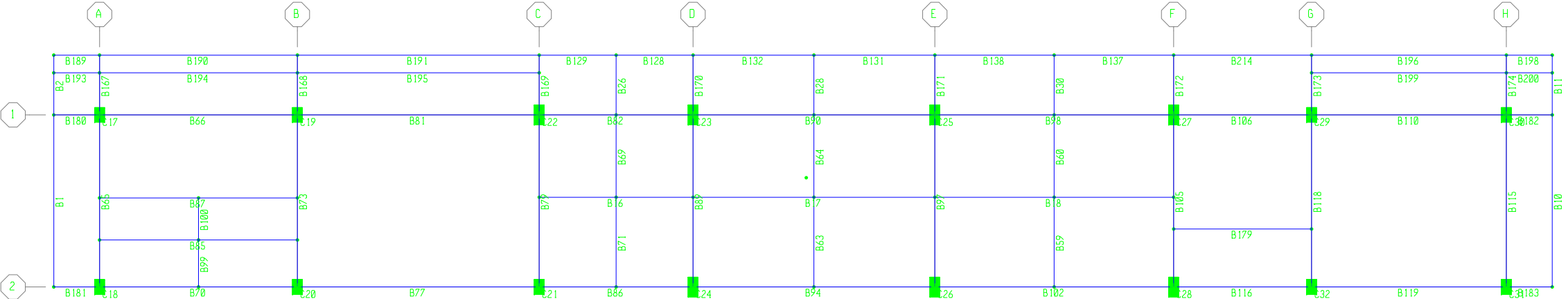
8. ANEXOS DEL COMPUTADOR

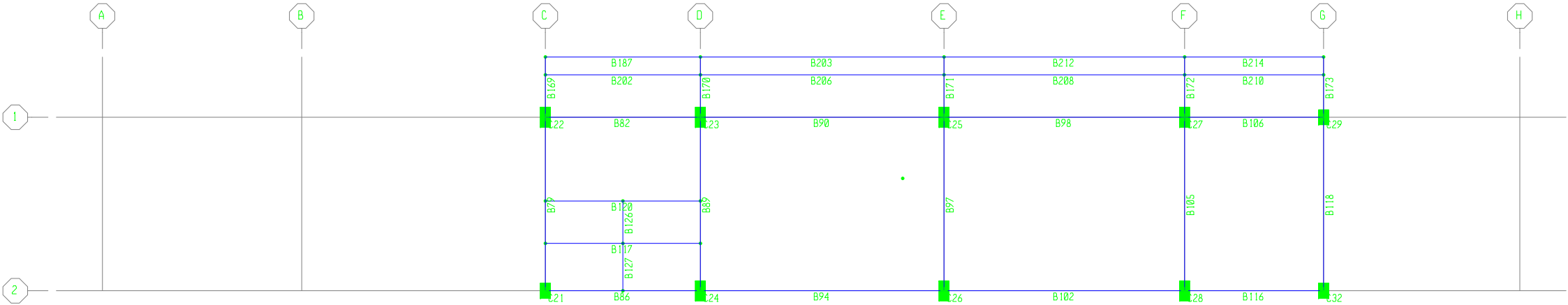
ANEXOS DEL COMPUTADOR











PROYECTO: I.E. EL SUR

DATOS DE ENTRADA DEL MODELO ESTRUCTURAL

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 1

S T O R Y D A T A

STORY	SIMILAR TO	HEIGHT	ELEVATION
N:+9.25	None	3.250	9.200
N:+6.00	None	3.250	5.950
N:+2.75	None	3.550	2.700
N:+0.8	None	0.726	-0.850
BASE	None		-1.576

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 2

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

POINT	X	Y	DZ-BELOW
127	51.500	7.950	0.000
128	59.475	7.950	0.000
129	59.475	0.900	0.000
130	51.500	0.900	0.000
131	1.875	7.950	0.000
132	1.875	0.900	0.000
133	9.975	7.950	0.000
134	9.975	0.900	0.000
135	19.875	0.900	0.000
136	19.875	7.950	0.000
137	26.175	7.950	0.000
138	26.175	0.900	0.000
139	36.075	7.950	0.000
140	36.075	0.900	0.000
141	45.850	7.950	0.000
142	45.850	0.900	0.000
161	1.875	10.400	0.000
162	9.975	10.400	0.000
163	19.875	10.400	0.000
164	26.175	10.400	0.000
165	36.075	10.400	0.000
166	45.850	10.400	0.000
167	51.500	10.400	0.000
168	59.475	10.400	0.000
171	45.850	3.275	0.000
172	51.500	3.275	0.000
177	0.000	10.400	0.000
178	0.000	7.950	0.000
183	0.000	0.900	0.000
188	61.350	10.400	0.000
189	61.350	7.950	0.000
194	61.350	0.900	0.000
220	0.000	9.675	0.000
221	1.875	9.675	0.000
222	9.975	9.675	0.000
223	19.875	9.675	0.000
225	51.500	9.675	0.000
226	59.475	9.675	0.000
227	61.350	9.675	0.000
228	26.175	9.675	0.000
230	36.075	9.675	0.000
231	45.850	9.675	0.000
7	5.925	0.900	0.000
8	5.925	7.950	0.000
9	5.925	10.400	0.000

10	1.875	4.575	0.000
11	9.975	4.575	0.000
12	19.875	4.575	0.000
13	26.175	4.575	0.000
14	36.075	4.575	0.000
15	45.850	4.575	0.000
16	51.500	4.575	0.000
17	59.475	4.575	0.000
18	0.000	4.575	0.000
19	61.350	4.575	0.000
20	14.923	0.900	0.000
21	14.923	7.950	0.000
22	14.923	10.400	0.000
23	23.023	7.950	0.000
24	23.023	0.900	0.000
25	23.023	10.400	0.000
26	31.123	0.900	0.000
27	31.123	7.950	0.000
28	31.123	10.400	0.000
29	40.960	0.900	0.000
30	40.960	7.950	0.000
31	40.960	10.400	0.000
33	55.485	7.950	0.000
34	55.485	10.400	0.000
40	55.485	4.575	0.000
41	40.960	4.575	0.000
42	31.123	4.575	0.000
43	23.023	4.575	0.000
44	14.923	4.575	0.000
45	5.925	4.575	0.000
67	55.488	0.900	0.000
81	1.875	2.825	0.000
82	9.975	2.825	0.000
83	1.875	4.549	0.000
84	9.975	4.549	0.000
86	5.925	2.825	0.000
87	5.925	4.549	0.000
117	19.875	2.825	0.000
118	26.175	2.825	0.000
119	19.875	4.549	0.000
120	26.175	4.549	0.000
121	23.023	2.825	0.000
122	23.023	4.549	0.000

TABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 3

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
C17	131	131	Below
C18	132	132	Below
C19	133	133	Below
C20	134	134	Below
C21	135	135	Below
C22	136	136	Below
C23	137	137	Below
C24	138	138	Below
C25	139	139	Below
C26	140	140	Below
C27	141	141	Below
C28	142	142	Below
C29	127	127	Below
C30	128	128	Below
C31	129	129	Below
C32	130	130	Below

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 4

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
B65	132	131
B66	131	133
B70	132	134
B73	134	133
B77	134	135
B79	136	135
B81	133	136
B82	136	137
B86	135	138
B89	138	137
B90	137	139
B94	138	140
B97	140	139
B98	139	141
B102	140	142
B105	142	141
B106	141	127
B110	127	128
B115	128	129
B116	142	130
B118	130	127
B119	130	129
B167	161	131
B168	162	133
B169	163	136
B170	164	137
B171	165	139
B172	166	141
B173	167	127
B174	128	168
B179	171	172
B180	178	131
B181	183	132
B182	128	189
B183	129	194
B187	163	164
B189	177	161
B190	161	162
B191	162	163
B193	220	221
B194	221	222
B195	222	223
B196	167	168
B198	168	188
B199	225	226
B200	226	227
B202	223	228
B203	164	165
B206	228	230
B208	230	231
B210	231	225
B212	165	166
B214	166	167
B1	183	178
B2	178	177
B10	194	189
B11	189	188
B13	9	8
B14	10	11
B15	11	12
B16	12	13
B17	13	14
B18	14	15
B20	16	17
B21	18	10
B22	17	19
B24	22	21
B26	25	23
B28	28	27

B30	31	30
B32	34	33
B41	161	9
B42	9	162
B56	40	33
B59	29	41
B60	41	30
B63	26	42
B64	42	27
B69	23	43
B71	43	24
B75	20	44
B76	44	21
B78	7	45
B80	45	8
B85	81	82
B87	83	84
B99	7	86
B100	86	87
B117	117	118
B120	119	120
B126	122	121
B127	121	24
B128	25	164
B129	163	25
B131	28	165
B132	164	28
B133	67	40
B134	167	34
B135	34	168
B137	31	166
B138	165	31
B139	162	22
B140	22	163

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 5

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
N:+9.25	D1	135	136	138	137	140
		139	142	141	130	127
		163	164	165	166	167
		230	231	225	223	228
		117	118	119	120	24
		121	122			
N:+6.00	D1	132	131	134	133	135
		136	138	137	140	139
		142	141	130	127	129
		128	168	161	162	163
		164	165	166	167	178
		183	189	194	171	172
		177	220	221	222	223
		188	225	226	227	81
		82	83	84	7	86
		87	23	24	25	12
		13	14	15	43	26
		27	28	42	29	30
		31	41			
N:+2.75	D1	132	131	134	133	135
		136	138	137	140	139
		142	141	130	127	129
		128	161	162	163	164
		165	166	167	168	171
		172	178	183	189	194
		177	188	7	8	9
		10	11	12	13	14
		15	16	17	18	19

20	21	22	23	24
25	26	27	28	29
30	31	33	34	40
41	42	43	44	45
67				

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 6

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

MATERIAL SHEAR NAME MODULUS	MATERIAL TYPE	DESIGN TYPE	MATERIAL DIR/PLANE	MODULUS OF ELASTICITY	POISSON'S RATIO	THERMAL COEFF
STEEL	Iso	Steel	All	199948000.00	0.3000	1.1700E-05
76903076.92						
CONC	Iso	Concrete	All	3600.000	0.2000	5.5000E-06
1500.000						
OTHER	Iso	None	All	29000.000	0.3000	6.5000E-06
11153.846						
CONC21	Iso	Concrete	All	21538000.000	0.2000	9.9000E-06
8974166.667						

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
CONC	2.2464E-07	8.6800E-05
OTHER	7.3240E-07	2.8300E-04
CONC21	2.4000E+00	2.4000E+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	344737.900	448159.300	271447.20

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
CONC	No	4.000	60.000	60.000	N/A
CONC21	No	21000.000	420000.000	420000.000	N/A

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 7

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

CONC FRAME SECTION NAME BEAM	MATERIAL NAME	SECTION SHAPE NAME OR NAME IN SECTION DATABASE FILE	CONC COL
VIG30X50	CONC21	Rectangular	
Yes			
VIG40X50	CONC21	Rectangular	
Yes			
COL40X60	CONC21	Rectangular	Yes
VIG15X50	CONC21	Rectangular	
Yes			
COL40X80	CONC21	Rectangular	Yes

VIG45X50	CONC21	Rectangular	
Yes			
VIG20X50	CONC21	Rectangular	
Yes			
VIG40X70	CONC21	Rectangular	
Yes			
COL40X90	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

FLANGE	FLANGE	SECTION	FLANGE	FLANGE	WEB
FRAME	SECTION	DEPTH	WIDTH	THICK	THICK
BOT	THICK BOT		TOP	TOP	WIDTH
VIG30X50		0.5000	0.3000	0.0000	0.0000
0.3000	0.0000				
VIG40X50		0.5000	0.4000	0.0000	0.0000
0.4000	0.0000				
COL40X60		0.4000	0.6000	0.0000	0.0000
0.6000	0.0000				
VIG15X50		0.5000	0.1500	0.0000	0.0000
0.1500	0.0000				
COL40X80		0.4000	0.8000	0.0000	0.0000
0.8000	0.0000				
VIG45X50		0.5000	0.4500	0.0000	0.0000
0.4500	0.0000				
VIG20X50		0.5000	0.2000	0.0000	0.0000
0.0000	0.0000				
VIG40X70		0.7000	0.4000	0.0000	0.0000
0.0000	0.0000				
COL40X90		0.4000	0.9000	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

SHEAR AREAS	SECTION	TORSIONAL	MOMENTS OF INERTIA
FRAME SECTION NAME	AREA	CONSTANT	I33 I22
A2 A3			
VIG30X50	0.1500	0.0028	0.0031 0.0011
0.1250 0.1250			
VIG40X50	0.2000	0.0055	0.0042 0.0027
0.1667 0.1667			
COL40X60	0.2400	0.0075	0.0032 0.0072
0.2000 0.2000			
VIG15X50	0.0750	0.0005	0.0016 0.0001
0.0625 0.0625			
COL40X80	0.3200	0.0117	0.0043 0.0171
0.2667 0.2667			
VIG45X50	0.2250	0.0070	0.0047 0.0038
0.1875 0.1875			
VIG20X50	0.1000	0.0010	0.0021 0.0003
0.0833 0.0833			
VIG40X70	0.2800	0.0096	0.0114 0.0037
0.2333 0.2333			
COL40X90	0.3600	0.0138	0.0048 0.0243
0.3000 0.3000			

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

RADIUS OF GYRATION	SECTION MODULI	PLASTIC MODULI
FRAME SECTION NAME	S33 S22	Z33 Z22
R33 R22		

VIG30X50		0.0125	0.0075	0.0188	0.0113
0.1443	0.0866				
VIG40X50		0.0167	0.0133	0.0250	0.0200
0.1443	0.1155				
COL40X60		0.0160	0.0240	0.0240	0.0360
0.1155	0.1732				
VIG15X50		0.0063	0.0019	0.0094	0.0028
0.1443	0.0433				
COL40X80		0.0213	0.0427	0.0320	0.0640
0.1155	0.2309				
VIG45X50		0.0188	0.0169	0.0281	0.0253
0.1443	0.1299				
VIG20X50		0.0083	0.0033	0.0125	0.0050
0.1443	0.0577				
VIG40X70		0.0327	0.0187	0.0490	0.0280
0.2021	0.1155				
COL40X90		0.0240	0.0540	0.0360	0.0810
0.1155	0.2598				

FRAME SECTION WEIGHTS AND MASSES

FRAME SECTION NAME	TOTAL WEIGHT	TOTAL MASS
VIG30X50	669.4200	66.9420
VIG40X50	1546.5600	154.6560
COL40X60	425.3990	42.5399
VIG15X50	476.9550	47.6955
COL40X80	385.9200	38.5920
VIG45X50	0.0000	0.0000
VIG20X50	487.8552	48.7855
VIG40X70	0.0000	0.0000
COL40X90	173.6640	17.3664

CONCRETE COLUMN DATA

BARS	BAR	REINF CONFIGURATION		REINF	NUM BARS	NUM
FRAME SECTION NAME		LONGIT	LATERAL	SIZE/TYPE	3DIR/2DIR	
CIRCULAR	COVER					
COL40X60		Rectangular Ties		#8/Design	6/4	
N/A	0.0500					
COL40X80		Rectangular Ties		#9/Design	8/4	
N/A	0.0500					
COL40X90		Rectangular Ties		#8/Design	9/4	
N/A	0.0500					

CONCRETE BEAM DATA

LEFT	BOT	RIGHT	TOP	BOT	TOP LEFT	TOP RIGHT	BOT
FRAME SECTION NAME			COVER	COVER	AREA	AREA	
AREA	AREA						
VIG30X50			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						
VIG15X50			0.0500	0.0500	0.000	0.000	
0.000	0.000						
VIG45X50			0.0500	0.0500	0.000	0.000	
0.000	0.000						
VIG20X50			0.0500	0.0500	0.000	0.000	
0.000	0.000						

VIG40X70 0.0500 0.0500 0.000 0.000
0.000 0.000

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 8

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	MATERIAL	SHELL	LOAD DIST	MEMBRANE	BENDING	TOTAL
TOTAL						
SECTION	NAME	TYPE	ONE WAY	THICK	THICK	WEIGHT
MASS						
PLACACUB1	CONC21	Membrane	Yes	0.0130	0.0130	165.4472
16.5447						
PLACAENT	CONC21	Membrane	No	0.2250	0.2250	3109.3672
310.9367						
PLACABAL	CONC21	Membrane	No	0.1420	0.1420	776.3040
77.6304						
PLACACUB2	CONC21	Membrane	No	0.1460	0.1460	184.1198
18.4120						

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 9

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

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

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 10

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

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	DISENO	9.8100
U2	----	N/A
UZ	----	N/A

RESP SPEC CASE: SISDISY

BASIC RESPONSE SPECTRUM DATA

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

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	DISENO	11.0200
UZ	----	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	9.8100
U2	----	N/A
UZ	----	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	11.0200
UZ	----	N/A

RESP SPEC CASE: SISUMBX

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0200	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	UMBRAL	10.8900
U2	----	N/A
UZ	----	N/A

RESP SPEC CASE: SISUMBY

BASIC RESPONSE SPECTRUM DATA

MODAL COMBO	DIRECTION COMBO	MODAL DAMPING	SPECTRUM ANGLE	TYPICAL ECCEN
SRSS	SRSS	0.0200	0.0000	0.0500

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	UMBRAL	12.3100
UZ	----	N/A

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 11

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	MUERTA	Static	1.4000
COMDIS2	ADD	MUERTA	Static	1.2000
		VIVA	Static	1.6000
COMDIS3	ADD	MUERTA	Static	1.2000
		VIVA	Static	1.0000
		SISDISX	Spectra	1.0000
		SISDISY	Spectra	0.3000
COMDIS4	ADD	MUERTA	Static	1.2000
		VIVA	Static	1.0000
		SISDISX	Spectra	0.3000
		SISDISY	Spectra	1.0000
COMDIS5	ADD	MUERTA	Static	0.9000
		SISDISX	Spectra	1.0000
		SISDISY	Spectra	0.3000
COMDIS6	ADD	MUERTA	Static	0.9000
		SISDISX	Spectra	0.3000
		SISDISY	Spectra	1.0000
ENVOLV	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
COMDER1	ADD	SISDERX	Spectra	1.0000
		SISDERY	Spectra	0.3000
COMDER2	ADD	SISDERX	Spectra	0.3000
		SISDERY	Spectra	1.0000
COMUMB1	ADD	SISUMBX	Spectra	1.0000
		SISUMBY	Spectra	0.3000
COMUMB2	ADD	SISUMBX	Spectra	0.3000
		SISUMBY	Spectra	1.0000
CIMEN1	ADD	MUERTA	Static	1.0000
		VIVA	Static	1.0000
CIMEN2	ADD	MUERTA	Static	1.0000
		VIVA	Static	0.7500
		SISDISX	Spectra	0.5250
		SISDISY	Spectra	0.1580
CIMEN3	ADD	MUERTA	Static	1.0000
		VIVA	Static	0.7500
		SISDISX	Spectra	0.1580
		SISDISY	Spectra	0.5250

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 12

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\dye\desktop\proyectos ingeniero carlos\ie del sur\modelo\derivadas
general.txt
DATA TYPE: Period vs Acceleration
NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	1.1250
0.0500	1.1250

0.1000	1.1250
0.1600	1.1250
0.2100	1.1250
0.4100	1.1250
0.6000	1.1250
0.8000	1.1250
1.0000	1.1250
1.3400	0.8370
1.6900	0.6660
2.0300	0.5530
2.3800	0.4730
2.7200	0.4130
3.0700	0.3670
3.4100	0.3300
3.7600	0.3000
4.1000	0.2740
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\dye\desktop\proyectos ingeniero carlos\ie del sur\modelo\diseno
general.txt

DATA TYPE: Period vs Acceleration

NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	0.2140
0.0500	0.2140
0.1000	0.2140
0.1600	0.2140
0.2100	0.2140
0.4100	0.2140
0.6000	0.2140
0.8000	0.2140
1.0000	0.2140
1.3400	0.1590
1.6900	0.1270
2.0300	0.1050
2.3800	0.0900
2.7200	0.0790
3.0700	0.0700
3.4100	0.0630
3.7600	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\dye\desktop\proyectos ingeniero carlos\ie del sur\modelo\umbral
diseno.txt
DATA TYPE: Period vs Acceleration
NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	0.0800
0.0500	0.1120
0.1000	0.1440
0.1500	0.1760
0.2000	0.2080
0.2500	0.2400
0.4900	0.2400
0.7300	0.2400
0.9800	0.2400
1.2200	0.2400
1.4600	0.2400
1.7000	0.2400
1.9500	0.2400
2.1900	0.2400
2.7800	0.1890
3.3800	0.1560
3.9700	0.1320
4.5600	0.1150
5.1600	0.1020
5.7500	0.0910
6.3400	0.0830
6.9400	0.0760
7.5300	0.0700
8.1300	0.0650
8.7200	0.0600
9.3100	0.0560
9.9100	0.0530
10.5000	0.0500
11.5000	0.0420
12.5000	0.0350

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 13

FRAME SECTION ASSIGNMENTS TO LINE OBJECTS

STORY DESIGN LEVEL PROCEDURE	LINE ID SECTION	LINE TYPE	SECTION TYPE	AUTO SELECT SECTION	ANALYSIS SECTION	DESIGN
N:+9.25 Frame COL40X60	C21	Column	Rectangular	None	COL40X60	Conc
N:+9.25 Frame COL40X80	C22	Column	Rectangular	None	COL40X80	Conc
N:+9.25 Frame COL40X80	C23	Column	Rectangular	None	COL40X80	Conc
N:+9.25 Frame COL40X80	C24	Column	Rectangular	None	COL40X80	Conc
N:+9.25 Frame COL40X90	C25	Column	Rectangular	None	COL40X90	Conc
N:+9.25 Frame COL40X90	C26	Column	Rectangular	None	COL40X90	Conc
N:+9.25 Frame COL40X80	C27	Column	Rectangular	None	COL40X80	Conc
N:+9.25 Frame COL40X80	C28	Column	Rectangular	None	COL40X80	Conc
N:+9.25 Frame COL40X60	C29	Column	Rectangular	None	COL40X60	Conc
N:+9.25 Frame COL40X60	C32	Column	Rectangular	None	COL40X60	Conc
N:+6.00 Frame COL40X60	C17	Column	Rectangular	None	COL40X60	Conc

N:+6.00	C18	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+6.00	C19	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+6.00	C20	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+6.00	C21	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+6.00	C22	Column	Rectangular	None	COL40X80	Conc
Frame	COL40X80					
N:+6.00	C23	Column	Rectangular	None	COL40X80	Conc
Frame	COL40X80					
N:+6.00	C24	Column	Rectangular	None	COL40X80	Conc
Frame	COL40X80					
N:+6.00	C25	Column	Rectangular	None	COL40X90	Conc
Frame	COL40X90					
N:+6.00	C26	Column	Rectangular	None	COL40X90	Conc
Frame	COL40X90					
N:+6.00	C27	Column	Rectangular	None	COL40X80	Conc
Frame	COL40X80					
N:+6.00	C28	Column	Rectangular	None	COL40X80	Conc
Frame	COL40X80					
N:+6.00	C29	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+6.00	C30	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+6.00	C31	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+6.00	C32	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+2.75	C17	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+2.75	C18	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+2.75	C19	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+2.75	C20	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+2.75	C21	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+2.75	C22	Column	Rectangular	None	COL40X80	Conc
Frame	COL40X80					
N:+2.75	C23	Column	Rectangular	None	COL40X80	Conc
Frame	COL40X80					
N:+2.75	C24	Column	Rectangular	None	COL40X80	Conc
Frame	COL40X80					
N:+2.75	C25	Column	Rectangular	None	COL40X90	Conc
Frame	COL40X90					
N:+2.75	C26	Column	Rectangular	None	COL40X90	Conc
Frame	COL40X90					
N:+2.75	C27	Column	Rectangular	None	COL40X80	Conc
Frame	COL40X80					
N:+2.75	C28	Column	Rectangular	None	COL40X80	Conc
Frame	COL40X80					
N:+2.75	C29	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+2.75	C30	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+2.75	C31	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+2.75	C32	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+0.8	C29	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+0.8	C30	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+0.8	C31	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					
N:+0.8	C32	Column	Rectangular	None	COL40X60	Conc
Frame	COL40X60					

N:+9.25	B79	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+9.25	B82	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+9.25	B86	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+9.25	B89	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+9.25	B90	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+9.25	B94	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+9.25	B97	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+9.25	B98	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+9.25	B102	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+9.25	B105	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+9.25	B106	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+9.25	B116	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+9.25	B118	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+9.25	B169	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+9.25	B170	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+9.25	B171	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+9.25	B172	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+9.25	B173	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+9.25	B187	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+9.25	B202	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+9.25	B203	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+9.25	B206	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+9.25	B208	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+9.25	B210	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+9.25	B212	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+9.25	B214	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+9.25	B117	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+9.25	B120	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+9.25	B126	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+9.25	B127	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B65	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B66	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B70	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+6.00	B73	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B77	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					

N:+6.00	B79	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B81	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B82	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B86	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+6.00	B89	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B90	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B94	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+6.00	B97	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B98	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B102	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+6.00	B105	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B106	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B110	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B115	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B116	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+6.00	B118	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B119	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+6.00	B167	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B168	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B169	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B170	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B171	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B172	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B173	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B174	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B179	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B180	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B181	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+6.00	B182	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+6.00	B183	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+6.00	B189	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B190	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B191	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B193	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B194	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					

N:+6.00	B195	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B196	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B198	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B199	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B200	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B214	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B1	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B2	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B10	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B11	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B16	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B17	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B18	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B26	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B28	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B30	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B59	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B60	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B63	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B64	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B69	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B71	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B85	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B87	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B99	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B100	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+6.00	B128	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B129	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B131	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B132	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B137	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+6.00	B138	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B65	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B66	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B70	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					

N:+2.75	B73	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B77	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+2.75	B79	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B81	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B82	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B86	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+2.75	B89	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B90	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B94	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+2.75	B97	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B98	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B102	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+2.75	B105	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B106	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B110	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B115	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B116	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+2.75	B118	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B119	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+2.75	B167	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B168	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B169	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B170	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B171	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B172	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B173	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B174	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B179	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B180	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B181	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+2.75	B182	Beam	Rectangular	None	VIG40X50	Conc
Frame	VIG40X50					
N:+2.75	B183	Beam	Rectangular	None	VIG30X50	Conc
Frame	VIG30X50					
N:+2.75	B189	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B198	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B214	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					

N:+2.75	B1	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B2	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B10	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B11	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B13	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B14	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B15	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B16	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B17	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B18	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B20	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B21	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B22	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B24	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B26	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B28	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B30	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B32	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B41	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B42	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B56	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B59	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B60	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B63	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B64	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B69	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B71	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B75	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B76	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B78	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B80	Beam	Rectangular	None	VIG20X50	Conc
Frame	VIG20X50					
N:+2.75	B128	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B129	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B131	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					
N:+2.75	B132	Beam	Rectangular	None	VIG15X50	Conc
Frame	VIG15X50					

N:+2.75	B133	Beam	Rectangular	None	VIG20X50	Conc
Frame VIG20X50						
N:+2.75	B134	Beam	Rectangular	None	VIG15X50	Conc
Frame VIG15X50						
N:+2.75	B135	Beam	Rectangular	None	VIG15X50	Conc
Frame VIG15X50						
N:+2.75	B137	Beam	Rectangular	None	VIG15X50	Conc
Frame VIG15X50						
N:+2.75	B138	Beam	Rectangular	None	VIG15X50	Conc
Frame VIG15X50						
N:+2.75	B139	Beam	Rectangular	None	VIG15X50	Conc
Frame VIG15X50						
N:+2.75	B140	Beam	Rectangular	None	VIG15X50	Conc
Frame VIG15X50						

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 14

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	STORY	LINE	LOAD	LOAD	ABSOLUTE	ABSOLUTE	
LOAD A	LOAD B						
CASE	LEVEL	ID	TYPE	DIRECTION	DISTANCE A	DISTANCE B	PER
LENGTH	PER LENGTH						
MUERTA	N:+9.25	B79	Force	Gravity	0.000	7.050	
2.930	2.930						
MUERTA	N:+9.25	B86	Force	Gravity	0.000	6.300	
2.930	2.930						
MUERTA	N:+9.25	B89	Force	Gravity	0.000	7.050	
2.930	2.930						
MUERTA	N:+9.25	B97	Force	Gravity	0.000	7.050	
1.230	1.230						
MUERTA	N:+9.25	B105	Force	Gravity	0.000	7.050	
1.230	1.230						
MUERTA	N:+9.25	B118	Force	Gravity	0.000	7.050	
1.230	1.230						
MUERTA	N:+9.25	B169	Force	Gravity	0.000	2.450	
1.230	1.230						
MUERTA	N:+9.25	B170	Force	Gravity	0.000	2.450	
1.230	1.230						
MUERTA	N:+9.25	B171	Force	Gravity	0.000	2.450	
1.230	1.230						
MUERTA	N:+9.25	B172	Force	Gravity	0.000	2.450	
1.230	1.230						
MUERTA	N:+9.25	B173	Force	Gravity	0.000	2.450	
1.230	1.230						
MUERTA	N:+9.25	B120	Force	Gravity	0.000	6.300	
2.930	2.930						
MUERTA	N:+6.00	B65	Force	Gravity	0.000	7.050	
2.930	2.930						
MUERTA	N:+6.00	B70	Force	Gravity	0.000	8.100	
2.930	2.930						
MUERTA	N:+6.00	B73	Force	Gravity	0.000	7.050	
2.930	2.930						
MUERTA	N:+6.00	B79	Force	Gravity	0.000	7.050	
5.360	5.360						
MUERTA	N:+6.00	B86	Force	Gravity	0.000	6.300	
5.360	5.360						
MUERTA	N:+6.00	B94	Force	Gravity	0.000	9.900	
5.360	5.360						
MUERTA	N:+6.00	B102	Force	Gravity	0.000	9.775	
5.360	5.360						
MUERTA	N:+6.00	B105	Force	Gravity	0.000	7.050	
5.360	5.360						
MUERTA	N:+6.00	B106	Force	Gravity	0.000	2.150	
34.590	34.590						
MUERTA	N:+6.00	B106	Force	Gravity	3.500	5.650	
34.590	34.590						
MUERTA	N:+6.00	B115	Force	Gravity	0.000	7.050	
1.230	1.230						

MUERTA	N:+6.00	B118	Force	Gravity	0.000	7.050
5.360	5.360					
MUERTA	N:+6.00	B167	Force	Gravity	0.000	2.450
1.230	1.230					
MUERTA	N:+6.00	B168	Force	Gravity	0.000	2.450
1.230	1.230					
MUERTA	N:+6.00	B169	Force	Gravity	0.000	2.450
5.360	5.360					
MUERTA	N:+6.00	B173	Force	Gravity	0.000	2.450
5.360	5.360					
MUERTA	N:+6.00	B174	Force	Gravity	0.000	2.450
1.230	1.230					
MUERTA	N:+6.00	B179	Force	Gravity	0.000	5.650
5.360	5.360					
MUERTA	N:+6.00	B214	Force	Gravity	0.000	5.650
2.150	2.150					
MUERTA	N:+6.00	B1	Force	Gravity	0.000	7.050
1.230	1.230					
MUERTA	N:+6.00	B2	Force	Gravity	0.000	2.450
1.230	1.230					
MUERTA	N:+6.00	B10	Force	Gravity	0.000	7.050
1.230	1.230					
MUERTA	N:+6.00	B11	Force	Gravity	0.000	2.450
1.230	1.230					
MUERTA	N:+6.00	B87	Force	Gravity	0.000	8.100
2.930	2.930					
MUERTA	N:+6.00	B128	Force	Gravity	0.000	3.152
2.150	2.150					
MUERTA	N:+6.00	B129	Force	Gravity	0.000	3.148
2.150	2.150					
MUERTA	N:+6.00	B131	Force	Gravity	0.000	4.952
2.150	2.150					
MUERTA	N:+6.00	B132	Force	Gravity	0.000	4.948
2.150	2.150					
MUERTA	N:+6.00	B137	Force	Gravity	0.000	4.890
2.150	2.150					
MUERTA	N:+6.00	B138	Force	Gravity	0.000	4.885
2.150	2.150					
MUERTA	N:+2.75	B70	Force	Gravity	0.000	8.100
5.360	5.360					
MUERTA	N:+2.75	B77	Force	Gravity	0.000	9.900
5.360	5.360					
MUERTA	N:+2.75	B86	Force	Gravity	0.000	6.300
5.360	5.360					
MUERTA	N:+2.75	B94	Force	Gravity	0.000	9.900
5.360	5.360					
MUERTA	N:+2.75	B102	Force	Gravity	0.000	9.775
5.360	5.360					
MUERTA	N:+2.75	B106	Force	Gravity	0.000	2.150
34.590	34.590					
MUERTA	N:+2.75	B106	Force	Gravity	3.500	5.650
34.590	34.590					
MUERTA	N:+2.75	B119	Force	Gravity	0.000	7.975
5.360	5.360					
MUERTA	N:+2.75	B179	Force	Gravity	0.000	5.650
5.360	5.360					
MUERTA	N:+2.75	B181	Force	Gravity	0.000	1.875
5.360	5.360					
MUERTA	N:+2.75	B183	Force	Gravity	0.000	1.875
5.360	5.360					
MUERTA	N:+2.75	B189	Force	Gravity	0.000	1.875
2.150	2.150					
MUERTA	N:+2.75	B198	Force	Gravity	0.000	1.875
2.150	2.150					
MUERTA	N:+2.75	B214	Force	Gravity	0.000	5.650
2.150	2.150					
MUERTA	N:+2.75	B41	Force	Gravity	0.000	4.050
2.150	2.150					
MUERTA	N:+2.75	B42	Force	Gravity	0.000	4.050
2.150	2.150					

MUERTA	N:+2.75	B128	Force	Gravity	0.000	3.152
2.150	2.150					
MUERTA	N:+2.75	B129	Force	Gravity	0.000	3.148
2.150	2.150					
MUERTA	N:+2.75	B131	Force	Gravity	0.000	4.952
2.150	2.150					
MUERTA	N:+2.75	B132	Force	Gravity	0.000	4.948
2.150	2.150					
MUERTA	N:+2.75	B134	Force	Gravity	0.000	3.985
2.150	2.150					
MUERTA	N:+2.75	B135	Force	Gravity	0.000	3.990
2.150	2.150					
MUERTA	N:+2.75	B137	Force	Gravity	0.000	4.890
2.150	2.150					
MUERTA	N:+2.75	B138	Force	Gravity	0.000	4.885
2.150	2.150					
MUERTA	N:+2.75	B139	Force	Gravity	0.000	4.948
2.150	2.150					
MUERTA	N:+2.75	B140	Force	Gravity	0.000	4.952
2.150	2.150					
VIVA	N:+6.00	B106	Force	Gravity	0.000	2.150
22.500	22.500					
VIVA	N:+6.00	B106	Force	Gravity	3.500	5.650
22.500	22.500					
VIVA	N:+2.75	B106	Force	Gravity	0.000	2.150
22.500	22.500					
VIVA	N:+2.75	B106	Force	Gravity	3.500	5.650
22.500	22.500					

ETABS v9.7.4 File:I.E. EL SUR Units:KN-m enero 11, 2017 9:58 PAGE 15

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
VIVA	N:+9.25	F79	Floor	Gravity	0.5000
VIVA	N:+9.25	F90	Floor	Gravity	0.5000
VIVA	N:+9.25	F105	Floor	Gravity	0.5000
VIVA	N:+9.25	F235	Floor	Gravity	0.5000
VIVA	N:+9.25	F236	Floor	Gravity	0.5000
VIVA	N:+9.25	F240	Floor	Gravity	0.5000
VIVA	N:+9.25	F241	Floor	Gravity	0.5000
VIVA	N:+9.25	F246	Floor	Gravity	0.5000
VIVA	N:+9.25	F248	Floor	Gravity	0.5000
VIVA	N:+9.25	F252	Floor	Gravity	0.5000
VIVA	N:+9.25	F253	Floor	Gravity	0.5000
VIVA	N:+9.25	F164	Floor	Gravity	0.5000
VIVA	N:+9.25	F185	Floor	Gravity	5.0000
VIVA	N:+9.25	F188	Floor	Gravity	5.0000
VIVA	N:+9.25	F189	Floor	Gravity	5.0000
VIVA	N:+9.25	F190	Floor	Gravity	5.0000
VIVA	N:+6.00	F59	Floor	Gravity	0.5000
VIVA	N:+6.00	F107	Floor	Gravity	0.5000
VIVA	N:+6.00	F167	Floor	Gravity	5.0000
VIVA	N:+6.00	F192	Floor	Gravity	0.5000
VIVA	N:+6.00	F202	Floor	Gravity	0.5000
VIVA	N:+6.00	F116	Floor	Gravity	5.0000
VIVA	N:+6.00	F118	Floor	Gravity	5.0000
VIVA	N:+6.00	F120	Floor	Gravity	5.0000
VIVA	N:+6.00	F122	Floor	Gravity	5.0000
VIVA	N:+6.00	F152	Floor	Gravity	2.0000
VIVA	N:+6.00	F156	Floor	Gravity	2.0000
VIVA	N:+6.00	F158	Floor	Gravity	2.0000
VIVA	N:+6.00	F191	Floor	Gravity	2.0000
VIVA	N:+6.00	F194	Floor	Gravity	2.0000
VIVA	N:+6.00	F199	Floor	Gravity	5.0000
VIVA	N:+6.00	F201	Floor	Gravity	2.0000
VIVA	N:+6.00	F204	Floor	Gravity	2.0000
VIVA	N:+6.00	F205	Floor	Gravity	5.0000
VIVA	N:+6.00	F206	Floor	Gravity	5.0000
VIVA	N:+6.00	F209	Floor	Gravity	2.0000

VIVA	N:+6.00	F211	Floor	Gravity	2.0000
VIVA	N:+6.00	F213	Floor	Gravity	2.0000
VIVA	N:+6.00	F216	Floor	Gravity	0.5000
VIVA	N:+6.00	F218	Floor	Gravity	2.0000
VIVA	N:+6.00	F221	Floor	Gravity	2.0000
VIVA	N:+6.00	F223	Floor	Gravity	5.0000
VIVA	N:+6.00	F224	Floor	Gravity	5.0000
VIVA	N:+6.00	F231	Floor	Gravity	5.0000
VIVA	N:+6.00	F264	Floor	Gravity	0.5000
VIVA	N:+6.00	F266	Floor	Gravity	0.5000
VIVA	N:+6.00	F271	Floor	Gravity	0.5000
VIVA	N:+6.00	F272	Floor	Gravity	0.5000
VIVA	N:+6.00	F277	Floor	Gravity	0.5000
VIVA	N:+6.00	F278	Floor	Gravity	0.5000
VIVA	N:+6.00	F283	Floor	Gravity	0.5000
VIVA	N:+6.00	F284	Floor	Gravity	0.5000
VIVA	N:+6.00	F288	Floor	Gravity	0.5000
VIVA	N:+6.00	F290	Floor	Gravity	0.5000
VIVA	N:+2.75	F167	Floor	Gravity	5.0000
VIVA	N:+2.75	F187	Floor	Gravity	5.0000
VIVA	N:+2.75	F197	Floor	Gravity	5.0000
VIVA	N:+2.75	F4	Floor	Gravity	2.0000
VIVA	N:+2.75	F6	Floor	Gravity	2.0000
VIVA	N:+2.75	F7	Floor	Gravity	5.0000
VIVA	N:+2.75	F8	Floor	Gravity	5.0000
VIVA	N:+2.75	F14	Floor	Gravity	2.0000
VIVA	N:+2.75	F16	Floor	Gravity	2.0000
VIVA	N:+2.75	F18	Floor	Gravity	2.0000
VIVA	N:+2.75	F20	Floor	Gravity	2.0000
VIVA	N:+2.75	F100	Floor	Gravity	2.0000
VIVA	N:+2.75	F103	Floor	Gravity	2.0000
VIVA	N:+2.75	F106	Floor	Gravity	2.0000
VIVA	N:+2.75	F152	Floor	Gravity	2.0000
VIVA	N:+2.75	F156	Floor	Gravity	2.0000
VIVA	N:+2.75	F158	Floor	Gravity	2.0000
VIVA	N:+2.75	F191	Floor	Gravity	2.0000
VIVA	N:+2.75	F194	Floor	Gravity	2.0000
VIVA	N:+2.75	F199	Floor	Gravity	5.0000
VIVA	N:+2.75	F201	Floor	Gravity	2.0000
VIVA	N:+2.75	F204	Floor	Gravity	2.0000
VIVA	N:+2.75	F205	Floor	Gravity	5.0000
VIVA	N:+2.75	F206	Floor	Gravity	5.0000
VIVA	N:+2.75	F209	Floor	Gravity	2.0000
VIVA	N:+2.75	F211	Floor	Gravity	2.0000
VIVA	N:+2.75	F213	Floor	Gravity	2.0000
VIVA	N:+2.75	F218	Floor	Gravity	2.0000
VIVA	N:+2.75	F221	Floor	Gravity	2.0000
VIVA	N:+2.75	F223	Floor	Gravity	5.0000
VIVA	N:+2.75	F224	Floor	Gravity	5.0000
VIVA	N:+2.75	F225	Floor	Gravity	2.0000
VIVA	N:+2.75	F226	Floor	Gravity	2.0000
VIVA	N:+2.75	F231	Floor	Gravity	5.0000
VIVA	N:+2.75	F238	Floor	Gravity	2.0000
VIVA	N:+2.75	F239	Floor	Gravity	2.0000
VIVA	N:+2.75	F247	Floor	Gravity	5.0000
VIVA	N:+2.75	F249	Floor	Gravity	2.0000
VIVA	N:+2.75	F250	Floor	Gravity	5.0000
VIVA	N:+2.75	F251	Floor	Gravity	2.0000
VIVA	N:+2.75	F254	Floor	Gravity	2.0000
VIVA	N:+2.75	F257	Floor	Gravity	5.0000
VIVA	N:+2.75	F258	Floor	Gravity	5.0000

FUERZAS EN VIGAS

BEAM FORCES

UNID: kN-m

Story	Beam	Load	Loc	V2	V3	T	M3
N:+6.00	B65	ENVOLV MAX	0.000	-18.720	0.000	63.737	74.39
N:+6.00	B65	ENVOLV MAX	1.925	-1.900	0.000	63.737	138.966
N:+6.00	B65	ENVOLV MAX	1.925	18.860	0.000	12.332	141.974
N:+6.00	B65	ENVOLV MAX	3.525	34.190	0.000	12.332	125.222
N:+6.00	B65	ENVOLV MAX	3.649	35.520	0.000	12.332	124.76
N:+6.00	B65	ENVOLV MAX	3.649	100.010	0.000	-13.330	130.265
N:+6.00	B65	ENVOLV MAX	7.050	146.390	0.000	-13.330	10.76
N:+6.00	B65	ENVOLV MIN	0.000	-138.000	0.000	3.358	-200.889
N:+6.00	B65	ENVOLV MIN	1.925	-110.040	0.000	3.358	-6.872
N:+6.00	B65	ENVOLV MIN	1.925	-52.480	0.000	2.177	-6.373
N:+6.00	B65	ENVOLV MIN	3.525	-31.010	0.000	2.177	51.483
N:+6.00	B65	ENVOLV MIN	3.649	-30.090	0.000	2.177	50.354
N:+6.00	B65	ENVOLV MIN	3.649	0.030	0.000	-58.117	53.256
N:+6.00	B65	ENVOLV MIN	7.050	28.460	0.000	-58.117	-311.09
N:+2.75	B65	ENVOLV MAX	0.000	-20.320	0.000	31.119	73.488
N:+2.75	B65	ENVOLV MAX	3.525	23.680	0.000	31.119	137.966
N:+2.75	B65	ENVOLV MAX	3.675	24.440	0.000	31.119	145.672
N:+2.75	B65	ENVOLV MAX	3.675	113.850	0.000	1.449	144.688
N:+2.75	B65	ENVOLV MAX	7.050	176.820	0.000	1.449	-4.517
N:+2.75	B65	ENVOLV MIN	0.000	-141.590	0.000	-2.337	-246.242
N:+2.75	B65	ENVOLV MIN	3.525	-71.080	0.000	-2.337	63.605
N:+2.75	B65	ENVOLV MIN	3.675	-70.030	0.000	-2.337	62.866
N:+2.75	B65	ENVOLV MIN	3.675	6.650	0.000	-24.530	64.438
N:+2.75	B65	ENVOLV MIN	7.050	46.170	0.000	-24.530	-366.009
N:+6.00	B66	ENVOLV MAX	0.000	-2.690	0.000	0.476	40.723
N:+6.00	B66	ENVOLV MAX	4.050	14.800	0.000	0.476	22.811
N:+6.00	B66	ENVOLV MAX	8.100	36.800	0.000	0.476	44.538
N:+6.00	B66	ENVOLV MIN	0.000	-42.000	0.000	-2.401	-106.738
N:+6.00	B66	ENVOLV MIN	4.050	-18.670	0.000	-2.401	9.53
N:+6.00	B66	ENVOLV MIN	8.100	0.150	0.000	-2.401	-79.178
N:+2.75	B66	ENVOLV MAX	0.000	-43.310	0.000	16.435	19.92
N:+2.75	B66	ENVOLV MAX	4.050	4.170	0.000	16.435	208.227
N:+2.75	B66	ENVOLV MAX	4.050	106.460	0.000	2.007	209.428
N:+2.75	B66	ENVOLV MAX	8.100	195.050	0.000	2.007	-27.852
N:+2.75	B66	ENVOLV MIN	0.000	-169.400	0.000	-2.372	-330.959
N:+2.75	B66	ENVOLV MIN	4.050	-80.810	0.000	-2.372	81.5
N:+2.75	B66	ENVOLV MIN	4.050	3.480	0.000	-16.567	80.918
N:+2.75	B66	ENVOLV MIN	8.100	50.960	0.000	-16.567	-416.715
N:+6.00	B70	ENVOLV MAX	0.000	-27.230	0.000	2.259	5.798
N:+6.00	B70	ENVOLV MAX	4.050	5.950	0.000	2.259	120.916
N:+6.00	B70	ENVOLV MAX	4.050	33.780	0.000	15.673	121.025
N:+6.00	B70	ENVOLV MAX	8.100	93.100	0.000	15.673	3.706
N:+6.00	B70	ENVOLV MIN	0.000	-93.620	0.000	-15.417	-161.201
N:+6.00	B70	ENVOLV MIN	4.050	-34.530	0.000	-15.417	46.533
N:+6.00	B70	ENVOLV MIN	4.050	-6.400	0.000	-1.908	44.936
N:+6.00	B70	ENVOLV MIN	8.100	26.770	0.000	-1.908	-154.268
N:+2.75	B70	ENVOLV MAX	0.000	-37.840	0.000	2.373	19.821
N:+2.75	B70	ENVOLV MAX	4.050	14.580	0.000	2.373	106.475
N:+2.75	B70	ENVOLV MAX	4.050	58.720	0.000	16.920	106.306
N:+2.75	B70	ENVOLV MAX	8.100	136.740	0.000	16.920	-16.783
N:+2.75	B70	ENVOLV MIN	0.000	-124.100	0.000	-18.852	-248.557
N:+2.75	B70	ENVOLV MIN	4.050	-46.080	0.000	-18.852	58.608
N:+2.75	B70	ENVOLV MIN	4.050	-7.630	0.000	-3.072	58.129
N:+2.75	B70	ENVOLV MIN	8.100	44.790	0.000	-3.072	-291.42
N:+6.00	B73	ENVOLV MAX	0.000	-22.210	0.000	-5.057	68.836
N:+6.00	B73	ENVOLV MAX	1.925	-3.220	0.000	-5.057	141.737
N:+6.00	B73	ENVOLV MAX	1.925	18.080	0.000	-2.228	144.624
N:+6.00	B73	ENVOLV MAX	3.525	35.560	0.000	-2.228	131.817
N:+6.00	B73	ENVOLV MAX	3.649	37.310	0.000	-2.228	131.149
N:+6.00	B73	ENVOLV MAX	3.649	102.340	0.000	53.547	136.696
N:+6.00	B73	ENVOLV MAX	7.050	160.650	0.000	53.547	3.917
N:+6.00	B73	ENVOLV MIN	0.000	-147.970	0.000	-61.183	-211.325
N:+6.00	B73	ENVOLV MIN	1.925	-113.250	0.000	-61.183	-8.323
N:+6.00	B73	ENVOLV MIN	1.925	-56.730	0.000	-13.551	-7.768
N:+6.00	B73	ENVOLV MIN	3.525	-29.990	0.000	-13.551	50.608
N:+6.00	B73	ENVOLV MIN	3.649	-28.940	0.000	-13.551	49.484
N:+6.00	B73	ENVOLV MIN	3.649	-0.260	0.000	13.476	52.347

N:+6.00	B73	ENVOLV MIN	7.050	32.000	0.000	13.476	-334.854
N:+2.75	B73	ENVOLV MAX	0.000	-52.860	0.000	27.361	20.004
N:+2.75	B73	ENVOLV MAX	3.525	-4.920	0.000	27.361	227.143
N:+2.75	B73	ENVOLV MAX	3.675	-4.170	0.000	27.361	238.221
N:+2.75	B73	ENVOLV MAX	3.675	167.460	0.000	10.806	239.703
N:+2.75	B73	ENVOLV MAX	7.050	235.200	0.000	10.806	-61.422
N:+2.75	B73	ENVOLV MIN	0.000	-184.460	0.000	-14.729	-310.474
N:+2.75	B73	ENVOLV MIN	3.525	-107.080	0.000	-14.729	122.946
N:+2.75	B73	ENVOLV MIN	3.675	-106.030	0.000	-14.729	123.754
N:+2.75	B73	ENVOLV MIN	3.675	37.910	0.000	-26.522	125.96
N:+2.75	B73	ENVOLV MIN	7.050	80.170	0.000	-26.522	-468.679
N:+6.00	B77	ENVOLV MAX	0.000	-8.420	0.000	1.906	4.626
N:+6.00	B77	ENVOLV MAX	4.950	7.620	0.000	1.906	11.96
N:+6.00	B77	ENVOLV MAX	9.900	26.750	0.000	1.906	21.873
N:+6.00	B77	ENVOLV MIN	0.000	-34.300	0.000	-0.737	-109.339
N:+6.00	B77	ENVOLV MIN	4.950	-12.910	0.000	-0.737	4.093
N:+6.00	B77	ENVOLV MIN	9.900	5.380	0.000	-0.737	-74.217
N:+2.75	B77	ENVOLV MAX	0.000	-69.500	0.000	1.373	-75.168
N:+2.75	B77	ENVOLV MAX	4.948	-1.820	0.000	1.373	175.17
N:+2.75	B77	ENVOLV MAX	4.948	43.650	0.000	17.227	175.459
N:+2.75	B77	ENVOLV MAX	9.900	145.430	0.000	17.227	-70.506
N:+2.75	B77	ENVOLV MIN	0.000	-147.580	0.000	-17.906	-316.463
N:+2.75	B77	ENVOLV MIN	4.948	-45.910	0.000	-17.906	97.082
N:+2.75	B77	ENVOLV MIN	4.948	0.590	0.000	-0.605	96.94
N:+2.75	B77	ENVOLV MIN	9.900	68.340	0.000	-0.605	-304.543
N:+9.25	B79	ENVOLV MAX	0.000	-26.510	0.000	-4.346	6.176
N:+9.25	B79	ENVOLV MAX	3.401	0.160	0.000	-4.346	100.353
N:+9.25	B79	ENVOLV MAX	3.401	22.740	0.000	10.530	96.229
N:+9.25	B79	ENVOLV MAX	3.525	23.630	0.000	10.530	97.432
N:+9.25	B79	ENVOLV MAX	5.125	41.320	0.000	10.530	118.896
N:+9.25	B79	ENVOLV MAX	5.125	84.240	0.000	32.510	116.94
N:+9.25	B79	ENVOLV MAX	7.050	110.630	0.000	32.510	70.864
N:+9.25	B79	ENVOLV MIN	0.000	-128.790	0.000	-32.078	-286.271
N:+9.25	B79	ENVOLV MIN	3.401	-87.870	0.000	-32.078	41.78
N:+9.25	B79	ENVOLV MIN	3.401	-35.730	0.000	0.731	38.864
N:+9.25	B79	ENVOLV MIN	3.525	-34.510	0.000	0.731	42.191
N:+9.25	B79	ENVOLV MIN	5.125	-17.140	0.000	0.731	-1.007
N:+9.25	B79	ENVOLV MIN	5.125	-3.680	0.000	0.504	-0.937
N:+9.25	B79	ENVOLV MIN	7.050	12.640	0.000	0.504	-151.052
N:+6.00	B79	ENVOLV MAX	0.000	-41.230	0.000	1.331	1.712
N:+6.00	B79	ENVOLV MAX	3.375	8.100	0.000	1.331	91.072
N:+6.00	B79	ENVOLV MAX	3.375	36.840	0.000	21.660	92.399
N:+6.00	B79	ENVOLV MAX	3.525	38.470	0.000	21.660	91.321
N:+6.00	B79	ENVOLV MAX	7.050	121.560	0.000	21.660	88.319
N:+6.00	B79	ENVOLV MIN	0.000	-165.490	0.000	-21.914	-348.069
N:+6.00	B79	ENVOLV MIN	3.375	-85.700	0.000	-21.914	42.371
N:+6.00	B79	ENVOLV MIN	3.375	-44.280	0.000	-1.749	41.036
N:+6.00	B79	ENVOLV MIN	3.525	-41.710	0.000	-1.749	46.006
N:+6.00	B79	ENVOLV MIN	7.050	14.540	0.000	-1.749	-191.285
N:+2.75	B79	ENVOLV MAX	0.000	-71.390	0.000	38.054	-47.599
N:+2.75	B79	ENVOLV MAX	3.375	-29.200	0.000	38.054	207.146
N:+2.75	B79	ENVOLV MAX	3.375	90.510	0.000	6.571	206.106
N:+2.75	B79	ENVOLV MAX	3.525	91.570	0.000	6.571	197.639
N:+2.75	B79	ENVOLV MAX	7.050	168.360	0.000	6.571	35.261
N:+2.75	B79	ENVOLV MIN	0.000	-215.710	0.000	-6.346	-435.841
N:+2.75	B79	ENVOLV MIN	3.375	-148.090	0.000	-6.346	104.142
N:+2.75	B79	ENVOLV MIN	3.375	-6.070	0.000	-36.771	101.749
N:+2.75	B79	ENVOLV MIN	3.525	-5.320	0.000	-36.771	102.601
N:+2.75	B79	ENVOLV MIN	7.050	42.280	0.000	-36.771	-277.69
N:+6.00	B81	ENVOLV MAX	0.000	-9.850	0.000	1.582	16.072
N:+6.00	B81	ENVOLV MAX	4.950	11.990	0.000	1.582	22.878
N:+6.00	B81	ENVOLV MAX	9.900	40.500	0.000	1.582	17.182
N:+6.00	B81	ENVOLV MIN	0.000	-38.680	0.000	-4.372	-101.614
N:+6.00	B81	ENVOLV MIN	4.950	-10.620	0.000	-4.372	11.771
N:+6.00	B81	ENVOLV MIN	9.900	10.760	0.000	-4.372	-116.287
N:+2.75	B81	ENVOLV MAX	0.000	-78.520	0.000	18.012	-97.183
N:+2.75	B81	ENVOLV MAX	4.948	-16.420	0.000	18.012	310.903
N:+2.75	B81	ENVOLV MAX	4.948	84.860	0.000	-1.383	310.802
N:+2.75	B81	ENVOLV MAX	9.900	211.020	0.000	-1.383	-79.635
N:+2.75	B81	ENVOLV MIN	0.000	-216.010	0.000	1.455	-452.786
N:+2.75	B81	ENVOLV MIN	4.948	-88.150	0.000	1.455	130.846
N:+2.75	B81	ENVOLV MIN	4.948	12.960	0.000	-18.456	131.048
N:+2.75	B81	ENVOLV MIN	9.900	75.130	0.000	-18.456	-438.134
N:+9.25	B82	ENVOLV MAX	0.000	2.800	0.000	0.307	34.101
N:+9.25	B82	ENVOLV MAX	3.150	13.010	0.000	0.307	12.679

N:+9.25	B82	ENVOLV MAX	6.300	25.850	0.000	0.307	28.818
N:+9.25	B82	ENVOLV MIN	0.000	-26.820	0.000	-1.405	-54.386
N:+9.25	B82	ENVOLV MIN	3.150	-13.210	0.000	-1.405	5.166
N:+9.25	B82	ENVOLV MIN	6.300	-2.240	0.000	-1.405	-47.856
N:+6.00	B82	ENVOLV MAX	0.000	-24.830	0.000	19.494	32.629
N:+6.00	B82	ENVOLV MAX	3.148	8.030	0.000	19.494	134.444
N:+6.00	B82	ENVOLV MAX	3.148	104.370	0.000	3.176	136.429
N:+6.00	B82	ENVOLV MAX	6.300	165.050	0.000	3.176	-5.906
N:+6.00	B82	ENVOLV MIN	0.000	-135.760	0.000	-3.242	-213.163
N:+6.00	B82	ENVOLV MIN	3.148	-75.210	0.000	-3.242	49.987
N:+6.00	B82	ENVOLV MIN	3.148	3.670	0.000	-17.408	50.139
N:+6.00	B82	ENVOLV MIN	6.300	36.600	0.000	-17.408	-302.199
N:+2.75	B82	ENVOLV MAX	0.000	-13.340	0.000	15.319	53.739
N:+2.75	B82	ENVOLV MAX	3.148	19.520	0.000	15.319	102.656
N:+2.75	B82	ENVOLV MAX	3.148	101.490	0.000	5.408	102.212
N:+2.75	B82	ENVOLV MAX	6.300	162.160	0.000	5.408	65.394
N:+2.75	B82	ENVOLV MIN	0.000	-168.630	0.000	-6.107	-343.26
N:+2.75	B82	ENVOLV MIN	3.148	-108.070	0.000	-6.107	35.275
N:+2.75	B82	ENVOLV MIN	3.148	-24.080	0.000	-15.454	34.543
N:+2.75	B82	ENVOLV MIN	6.300	8.850	0.000	-15.454	-321.161
N:+9.25	B86	ENVOLV MAX	0.000	-18.990	0.000	3.409	11.271
N:+9.25	B86	ENVOLV MAX	3.148	6.150	0.000	3.409	76.139
N:+9.25	B86	ENVOLV MAX	3.148	30.680	0.000	13.533	76.377
N:+9.25	B86	ENVOLV MAX	6.300	74.770	0.000	13.533	2.725
N:+9.25	B86	ENVOLV MIN	0.000	-71.370	0.000	-11.014	-92.903
N:+9.25	B86	ENVOLV MIN	3.148	-27.340	0.000	-11.014	30.265
N:+9.25	B86	ENVOLV MIN	3.148	-4.110	0.000	-3.926	29.379
N:+9.25	B86	ENVOLV MIN	6.300	21.060	0.000	-3.926	-101.453
N:+6.00	B86	ENVOLV MAX	0.000	-20.620	0.000	4.617	31.279
N:+6.00	B86	ENVOLV MAX	3.148	16.810	0.000	4.617	65.823
N:+6.00	B86	ENVOLV MAX	3.148	57.350	0.000	16.745	66.191
N:+6.00	B86	ENVOLV MAX	6.300	112.300	0.000	16.745	-1.043
N:+6.00	B86	ENVOLV MIN	0.000	-93.220	0.000	-17.537	-144.117
N:+6.00	B86	ENVOLV MIN	3.148	-38.370	0.000	-17.537	34.537
N:+6.00	B86	ENVOLV MIN	3.148	-6.090	0.000	-5.510	35.048
N:+6.00	B86	ENVOLV MIN	6.300	31.400	0.000	-5.510	-205.335
N:+2.75	B86	ENVOLV MAX	0.000	-12.880	0.000	6.107	43.873
N:+2.75	B86	ENVOLV MAX	3.148	24.550	0.000	6.107	50.366
N:+2.75	B86	ENVOLV MAX	3.148	57.260	0.000	17.456	49.637
N:+2.75	B86	ENVOLV MAX	6.300	112.210	0.000	17.456	60.678
N:+2.75	B86	ENVOLV MIN	0.000	-119.160	0.000	-14.072	-239.71
N:+2.75	B86	ENVOLV MIN	3.148	-64.310	0.000	-14.072	24.22
N:+2.75	B86	ENVOLV MIN	3.148	-28.500	0.000	-5.971	24.625
N:+2.75	B86	ENVOLV MIN	6.300	8.980	0.000	-5.971	-222.73
N:+9.25	B89	ENVOLV MAX	0.000	-17.350	0.000	-2.729	66.559
N:+9.25	B89	ENVOLV MAX	1.925	1.640	0.000	-2.729	120.071
N:+9.25	B89	ENVOLV MAX	1.925	15.280	0.000	-1.276	121.578
N:+9.25	B89	ENVOLV MAX	3.525	34.120	0.000	-1.276	105.318
N:+9.25	B89	ENVOLV MAX	3.649	35.880	0.000	-1.276	104.235
N:+9.25	B89	ENVOLV MAX	3.649	88.330	0.000	30.214	108.149
N:+9.25	B89	ENVOLV MAX	7.050	143.960	0.000	30.214	-2.396
N:+9.25	B89	ENVOLV MIN	0.000	-128.450	0.000	-34.624	-182.519
N:+9.25	B89	ENVOLV MIN	1.925	-93.730	0.000	-34.624	-7.056
N:+9.25	B89	ENVOLV MIN	1.925	-49.650	0.000	-10.249	-7.04
N:+9.25	B89	ENVOLV MIN	3.525	-24.280	0.000	-10.249	43.08
N:+9.25	B89	ENVOLV MIN	3.649	-23.220	0.000	-10.249	42.085
N:+9.25	B89	ENVOLV MIN	3.649	-0.810	0.000	6.667	44.308
N:+9.25	B89	ENVOLV MIN	7.050	30.580	0.000	6.667	-304.597
N:+6.00	B89	ENVOLV MAX	0.000	-45.010	0.000	29.148	29.964
N:+6.00	B89	ENVOLV MAX	3.525	2.590	0.000	29.148	201.301
N:+6.00	B89	ENVOLV MAX	3.675	3.350	0.000	29.148	210.38
N:+6.00	B89	ENVOLV MAX	3.675	153.860	0.000	1.568	211.516
N:+6.00	B89	ENVOLV MAX	7.050	221.490	0.000	1.568	-61.596
N:+6.00	B89	ENVOLV MIN	0.000	-171.260	0.000	-3.105	-287.24
N:+6.00	B89	ENVOLV MIN	3.525	-94.470	0.000	-3.105	106.724
N:+6.00	B89	ENVOLV MIN	3.675	-93.410	0.000	-3.105	106.286
N:+6.00	B89	ENVOLV MIN	3.675	33.340	0.000	-28.795	108.658
N:+6.00	B89	ENVOLV MIN	7.050	75.540	0.000	-28.795	-449.466
N:+2.75	B89	ENVOLV MAX	0.000	-42.200	0.000	41.243	34.135
N:+2.75	B89	ENVOLV MAX	3.525	5.410	0.000	41.243	191.093
N:+2.75	B89	ENVOLV MAX	3.675	6.160	0.000	41.243	199.853
N:+2.75	B89	ENVOLV MAX	3.675	144.780	0.000	6.056	200.52
N:+2.75	B89	ENVOLV MAX	7.050	212.410	0.000	6.056	-39.634
N:+2.75	B89	ENVOLV MIN	0.000	-171.370	0.000	-8.154	-296.459
N:+2.75	B89	ENVOLV MIN	3.525	-94.570	0.000	-8.154	100.941

N:+2.75	B89	ENVOLV MIN	3.675	-93.510	0.000	-8.154	100.08
N:+2.75	B89	ENVOLV MIN	3.675	25.200	0.000	-37.788	102.406
N:+2.75	B89	ENVOLV MIN	7.050	67.400	0.000	-37.788	-428.813
N:+9.25	B90	ENVOLV MAX	0.000	-10.980	0.000	0.589	-2.722
N:+9.25	B90	ENVOLV MAX	4.950	5.050	0.000	0.589	20.066
N:+9.25	B90	ENVOLV MAX	9.900	26.140	0.000	0.589	0.622
N:+9.25	B90	ENVOLV MIN	0.000	-27.030	0.000	-1.431	-63.353
N:+9.25	B90	ENVOLV MIN	4.950	-5.650	0.000	-1.431	11.951
N:+9.25	B90	ENVOLV MIN	9.900	10.690	0.000	-1.431	-60.841
N:+6.00	B90	ENVOLV MAX	0.000	-80.440	0.000	18.148	-112.084
N:+6.00	B90	ENVOLV MAX	4.948	-18.340	0.000	18.148	297.721
N:+6.00	B90	ENVOLV MAX	4.948	83.110	0.000	-0.828	297.436
N:+6.00	B90	ENVOLV MAX	9.900	216.440	0.000	-0.828	-127.695
N:+6.00	B90	ENVOLV MIN	0.000	-208.450	0.000	1.525	-406.27
N:+6.00	B90	ENVOLV MIN	4.948	-76.410	0.000	1.525	125.331
N:+6.00	B90	ENVOLV MIN	4.948	21.730	0.000	-18.974	125.662
N:+6.00	B90	ENVOLV MIN	9.900	83.900	0.000	-18.974	-442.242
N:+2.75	B90	ENVOLV MAX	0.000	-71.790	0.000	17.358	-71.105
N:+2.75	B90	ENVOLV MAX	4.948	-9.690	0.000	17.358	298.476
N:+2.75	B90	ENVOLV MAX	4.948	91.640	0.000	0.819	298.317
N:+2.75	B90	ENVOLV MAX	9.900	216.900	0.000	0.819	-87.856
N:+2.75	B90	ENVOLV MIN	0.000	-207.070	0.000	0.804	-436.924
N:+2.75	B90	ENVOLV MIN	4.948	-83.180	0.000	0.804	124.28
N:+2.75	B90	ENVOLV MIN	4.948	13.830	0.000	-19.788	124.926
N:+2.75	B90	ENVOLV MIN	9.900	76.000	0.000	-19.788	-484.029
N:+9.25	B94	ENVOLV MAX	0.000	-11.660	0.000	1.423	-7.848
N:+9.25	B94	ENVOLV MAX	4.950	4.370	0.000	1.423	17.549
N:+9.25	B94	ENVOLV MAX	9.900	24.600	0.000	1.423	3.843
N:+9.25	B94	ENVOLV MIN	0.000	-28.840	0.000	-0.626	-75.477
N:+9.25	B94	ENVOLV MIN	4.950	-7.450	0.000	-0.626	10.191
N:+9.25	B94	ENVOLV MIN	9.900	9.740	0.000	-0.626	-56.676
N:+6.00	B94	ENVOLV MAX	0.000	-71.530	0.000	1.026	-91.731
N:+6.00	B94	ENVOLV MAX	4.948	-3.860	0.000	1.026	165.471
N:+6.00	B94	ENVOLV MAX	4.948	41.580	0.000	17.396	165.137
N:+6.00	B94	ENVOLV MAX	9.900	143.350	0.000	17.396	-105.248
N:+6.00	B94	ENVOLV MIN	0.000	-138.860	0.000	-17.313	-281.009
N:+6.00	B94	ENVOLV MIN	4.948	-37.190	0.000	-17.313	91.811
N:+6.00	B94	ENVOLV MIN	4.948	6.710	0.000	-1.426	91.873
N:+6.00	B94	ENVOLV MIN	9.900	74.460	0.000	-1.426	-304.785
N:+2.75	B94	ENVOLV MAX	0.000	-64.680	0.000	0.792	-58.366
N:+2.75	B94	ENVOLV MAX	4.948	3.000	0.000	0.792	166.959
N:+2.75	B94	ENVOLV MAX	4.948	48.950	0.000	19.499	166.466
N:+2.75	B94	ENVOLV MAX	9.900	150.730	0.000	19.499	-71.045
N:+2.75	B94	ENVOLV MIN	0.000	-146.420	0.000	-18.477	-315.61
N:+2.75	B94	ENVOLV MIN	4.948	-44.750	0.000	-18.477	91.811
N:+2.75	B94	ENVOLV MIN	4.948	0.090	0.000	-1.759	92.16
N:+2.75	B94	ENVOLV MIN	9.900	67.830	0.000	-1.759	-340.583
N:+9.25	B97	ENVOLV MAX	0.000	12.340	0.000	0.995	109.837
N:+9.25	B97	ENVOLV MAX	3.525	49.890	0.000	0.995	38.025
N:+9.25	B97	ENVOLV MAX	7.050	105.720	0.000	0.995	29.982
N:+9.25	B97	ENVOLV MIN	0.000	-65.680	0.000	-1.276	-101.594
N:+9.25	B97	ENVOLV MIN	3.525	-18.540	0.000	-1.276	15.449
N:+9.25	B97	ENVOLV MIN	7.050	10.330	0.000	-1.276	-242.803
N:+6.00	B97	ENVOLV MAX	0.000	-57.010	0.000	12.009	11.42
N:+6.00	B97	ENVOLV MAX	3.525	-9.070	0.000	12.009	243.671
N:+6.00	B97	ENVOLV MAX	3.675	-8.320	0.000	12.009	256.316
N:+6.00	B97	ENVOLV MAX	3.675	180.220	0.000	11.867	257.832
N:+6.00	B97	ENVOLV MAX	7.050	247.960	0.000	11.867	-81.255
N:+6.00	B97	ENVOLV MIN	0.000	-193.570	0.000	-12.361	-328.718
N:+6.00	B97	ENVOLV MIN	3.525	-116.190	0.000	-12.361	130.153
N:+6.00	B97	ENVOLV MIN	3.675	-115.130	0.000	-12.361	131.455
N:+6.00	B97	ENVOLV MIN	3.675	46.040	0.000	-11.740	133.649
N:+6.00	B97	ENVOLV MIN	7.050	88.300	0.000	-11.740	-497.537
N:+2.75	B97	ENVOLV MAX	0.000	-54.890	0.000	19.931	19.019
N:+2.75	B97	ENVOLV MAX	3.525	-6.950	0.000	19.931	244.799
N:+2.75	B97	ENVOLV MAX	3.675	-6.190	0.000	19.931	258.22
N:+2.75	B97	ENVOLV MAX	3.675	181.660	0.000	18.573	259.53
N:+2.75	B97	ENVOLV MAX	7.050	249.390	0.000	18.573	-56.973
N:+2.75	B97	ENVOLV MIN	0.000	-203.150	0.000	-20.335	-361.307
N:+2.75	B97	ENVOLV MIN	3.525	-125.770	0.000	-20.335	130.251
N:+2.75	B97	ENVOLV MIN	3.675	-124.720	0.000	-20.335	131.256
N:+2.75	B97	ENVOLV MIN	3.675	39.260	0.000	-18.589	133.645
N:+2.75	B97	ENVOLV MIN	7.050	81.520	0.000	-18.589	-501.662
N:+9.25	B98	ENVOLV MAX	0.000	-10.460	0.000	0.965	1.472
N:+9.25	B98	ENVOLV MAX	4.888	5.560	0.000	0.965	20.339

N:+9.25	B98	ENVOLV MAX	9.775	26.670	0.000	0.965	0.087
N:+9.25	B98	ENVOLV MIN	0.000	-26.360	0.000	-0.780	-60.762
N:+9.25	B98	ENVOLV MIN	4.888	-5.430	0.000	-0.780	12.226
N:+9.25	B98	ENVOLV MIN	9.775	10.400	0.000	-0.780	-60.593
N:+6.00	B98	ENVOLV MAX	0.000	-83.130	0.000	19.442	-124.366
N:+6.00	B98	ENVOLV MAX	4.885	-22.050	0.000	19.442	294.961
N:+6.00	B98	ENVOLV MAX	4.885	77.610	0.000	-1.008	295.938
N:+6.00	B98	ENVOLV MAX	9.775	207.990	0.000	-1.008	-110.339
N:+6.00	B98	ENVOLV MIN	0.000	-215.550	0.000	2.588	-439.826
N:+6.00	B98	ENVOLV MIN	4.885	-85.440	0.000	2.588	124.087
N:+6.00	B98	ENVOLV MIN	4.885	19.190	0.000	-22.083	124.324
N:+6.00	B98	ENVOLV MIN	9.775	80.350	0.000	-22.083	-401.777
N:+2.75	B98	ENVOLV MAX	0.000	-74.320	0.000	18.897	-82.494
N:+2.75	B98	ENVOLV MAX	4.885	-13.250	0.000	18.897	294.375
N:+2.75	B98	ENVOLV MAX	4.885	83.780	0.000	1.112	294.987
N:+2.75	B98	ENVOLV MAX	9.775	205.590	0.000	1.112	-66.795
N:+2.75	B98	ENVOLV MIN	0.000	-215.910	0.000	1.367	-484.543
N:+2.75	B98	ENVOLV MIN	4.885	-94.620	0.000	1.367	121.54
N:+2.75	B98	ENVOLV MIN	4.885	9.750	0.000	-22.865	121.174
N:+2.75	B98	ENVOLV MIN	9.775	70.910	0.000	-22.865	-430.854
N:+9.25	B102	ENVOLV MAX	0.000	-9.900	0.000	0.820	3.999
N:+9.25	B102	ENVOLV MAX	4.888	6.330	0.000	0.820	19.88
N:+9.25	B102	ENVOLV MAX	9.775	27.450	0.000	0.820	-1.097
N:+9.25	B102	ENVOLV MIN	0.000	-25.980	0.000	-0.839	-59.309
N:+9.25	B102	ENVOLV MIN	4.888	-5.260	0.000	-0.839	11.878
N:+9.25	B102	ENVOLV MIN	9.775	10.570	0.000	-0.839	-64.694
N:+6.00	B102	ENVOLV MAX	0.000	-73.850	0.000	0.723	-102.36
N:+6.00	B102	ENVOLV MAX	4.885	-7.250	0.000	0.723	165.198
N:+6.00	B102	ENVOLV MAX	4.885	37.720	0.000	19.277	166.015
N:+6.00	B102	ENVOLV MAX	9.775	137.860	0.000	19.277	-88.748
N:+6.00	B102	ENVOLV MIN	0.000	-143.440	0.000	-18.108	-303.138
N:+6.00	B102	ENVOLV MIN	4.885	-43.430	0.000	-18.108	91.15
N:+6.00	B102	ENVOLV MIN	4.885	4.250	0.000	-1.891	91.431
N:+6.00	B102	ENVOLV MIN	9.775	70.940	0.000	-1.891	-274.166
N:+2.75	B102	ENVOLV MAX	0.000	-66.840	0.000	1.229	-67.304
N:+2.75	B102	ENVOLV MAX	4.885	-0.230	0.000	1.229	166.376
N:+2.75	B102	ENVOLV MAX	4.885	44.200	0.000	21.468	167.01
N:+2.75	B102	ENVOLV MAX	9.775	144.340	0.000	21.468	-53.065
N:+2.75	B102	ENVOLV MIN	0.000	-151.530	0.000	-19.557	-341.941
N:+2.75	B102	ENVOLV MIN	4.885	-51.520	0.000	-19.557	90.626
N:+2.75	B102	ENVOLV MIN	4.885	-3.250	0.000	-2.738	90.624
N:+2.75	B102	ENVOLV MIN	9.775	63.450	0.000	-2.738	-303.681
N:+9.25	B105	ENVOLV MAX	0.000	16.260	0.000	0.464	121.881
N:+9.25	B105	ENVOLV MAX	3.525	51.180	0.000	0.464	33.726
N:+9.25	B105	ENVOLV MAX	7.050	100.450	0.000	0.464	42.303
N:+9.25	B105	ENVOLV MIN	0.000	-62.380	0.000	-1.406	-107.51
N:+9.25	B105	ENVOLV MIN	3.525	-21.250	0.000	-1.406	14.439
N:+9.25	B105	ENVOLV MIN	7.050	5.510	0.000	-1.406	-238.904
N:+6.00	B105	ENVOLV MAX	0.000	-35.590	0.000	7.416	65.675
N:+6.00	B105	ENVOLV MAX	2.375	-1.570	0.000	7.416	153.888
N:+6.00	B105	ENVOLV MAX	2.375	21.700	0.000	-40.821	153.255
N:+6.00	B105	ENVOLV MAX	3.525	36.260	0.000	-40.821	138.466
N:+6.00	B105	ENVOLV MAX	3.675	37.690	0.000	-40.821	140.001
N:+6.00	B105	ENVOLV MAX	3.675	125.760	0.000	52.333	140.654
N:+6.00	B105	ENVOLV MAX	7.050	191.060	0.000	52.333	-9.522
N:+6.00	B105	ENVOLV MIN	0.000	-157.350	0.000	-35.358	-263.174
N:+6.00	B105	ENVOLV MIN	2.375	-106.930	0.000	-35.358	17.58
N:+6.00	B105	ENVOLV MIN	2.375	-75.430	0.000	-78.047	17.197
N:+6.00	B105	ENVOLV MIN	3.525	-54.340	0.000	-78.047	80.917
N:+6.00	B105	ENVOLV MIN	3.675	-52.410	0.000	-78.047	75.505
N:+6.00	B105	ENVOLV MIN	3.675	7.010	0.000	12.987	76.785
N:+6.00	B105	ENVOLV MIN	7.050	51.710	0.000	12.987	-411.526
N:+2.75	B105	ENVOLV MAX	0.000	-12.020	0.000	15.441	103.608
N:+2.75	B105	ENVOLV MAX	2.375	10.550	0.000	15.441	143.023
N:+2.75	B105	ENVOLV MAX	2.375	31.170	0.000	-38.187	143.002
N:+2.75	B105	ENVOLV MAX	3.525	40.190	0.000	-38.187	122.184
N:+2.75	B105	ENVOLV MAX	3.675	40.890	0.000	-38.187	124.735
N:+2.75	B105	ENVOLV MAX	3.675	126.270	0.000	58.551	125.192
N:+2.75	B105	ENVOLV MAX	7.050	169.860	0.000	58.551	43.536
N:+2.75	B105	ENVOLV MIN	0.000	-141.580	0.000	-46.767	-271.191
N:+2.75	B105	ENVOLV MIN	2.375	-106.440	0.000	-46.767	-3.334
N:+2.75	B105	ENVOLV MIN	2.375	-81.060	0.000	-76.688	-3.435
N:+2.75	B105	ENVOLV MIN	3.525	-67.360	0.000	-76.688	68.86
N:+2.75	B105	ENVOLV MIN	3.675	-66.400	0.000	-76.688	62.778
N:+2.75	B105	ENVOLV MIN	3.675	-3.560	0.000	7.508	64.189

N:+2.75	B105	ENVOLV MIN	7.050	24.860	0.000	7.508	-393.199
N:+9.25	B106	ENVOLV MAX	0.000	5.570	0.000	2.123	31.529
N:+9.25	B106	ENVOLV MAX	2.825	15.730	0.000	2.123	7.112
N:+9.25	B106	ENVOLV MAX	5.650	27.940	0.000	2.123	38.05
N:+9.25	B106	ENVOLV MIN	0.000	-27.130	0.000	-0.271	-52.293
N:+9.25	B106	ENVOLV MIN	2.825	-15.940	0.000	-0.271	2.863
N:+9.25	B106	ENVOLV MIN	5.650	-6.780	0.000	-0.271	-57.67
N:+6.00	B106	ENVOLV MAX	0.000	-62.300	0.000	0.451	-2.587
N:+6.00	B106	ENVOLV MAX	2.825	25.150	0.000	0.451	72.134
N:+6.00	B106	ENVOLV MAX	5.650	194.400	0.000	0.451	46.663
N:+6.00	B106	ENVOLV MIN	0.000	-238.250	0.000	-2.509	-308.599
N:+6.00	B106	ENVOLV MIN	2.825	-53.760	0.000	-2.509	24.199
N:+6.00	B106	ENVOLV MIN	5.650	42.960	0.000	-2.509	-196.181
N:+2.75	B106	ENVOLV MAX	0.000	-39.090	0.000	3.147	58.716
N:+2.75	B106	ENVOLV MAX	2.825	48.350	0.000	3.147	45.654
N:+2.75	B106	ENVOLV MAX	5.650	226.380	0.000	3.147	42.035
N:+2.75	B106	ENVOLV MIN	0.000	-228.850	0.000	-2.413	-330.057
N:+2.75	B106	ENVOLV MIN	2.825	-50.320	0.000	-2.413	4.382
N:+2.75	B106	ENVOLV MIN	5.650	37.630	0.000	-2.413	-302.247
N:+6.00	B110	ENVOLV MAX	0.000	2.590	0.000	2.764	47.234
N:+6.00	B110	ENVOLV MAX	3.988	19.940	0.000	2.764	9.236
N:+6.00	B110	ENVOLV MAX	7.975	42.910	0.000	2.764	45.212
N:+6.00	B110	ENVOLV MIN	0.000	-40.570	0.000	-1.044	-109.732
N:+6.00	B110	ENVOLV MIN	3.988	-17.720	0.000	-1.044	-0.431
N:+6.00	B110	ENVOLV MIN	7.975	-0.500	0.000	-1.044	-125.377
N:+2.75	B110	ENVOLV MAX	0.000	-52.490	0.000	20.875	-23.984
N:+2.75	B110	ENVOLV MAX	3.985	-6.060	0.000	20.875	233.883
N:+2.75	B110	ENVOLV MAX	3.985	88.030	0.000	4.953	233.293
N:+2.75	B110	ENVOLV MAX	7.975	174.750	0.000	4.953	-5.793
N:+2.75	B110	ENVOLV MIN	0.000	-182.020	0.000	-0.827	-336.085
N:+2.75	B110	ENVOLV MIN	3.985	-95.460	0.000	-0.827	89.895
N:+2.75	B110	ENVOLV MIN	3.985	6.300	0.000	-19.826	90.277
N:+2.75	B110	ENVOLV MIN	7.975	52.800	0.000	-19.826	-327.589
N:+6.00	B115	ENVOLV MAX	0.000	9.170	0.000	3.158	86.269
N:+6.00	B115	ENVOLV MAX	3.525	33.180	0.000	3.158	25.842
N:+6.00	B115	ENVOLV MAX	7.050	65.380	0.000	3.158	169.97
N:+6.00	B115	ENVOLV MIN	0.000	-102.800	0.000	-1.526	-267.918
N:+6.00	B115	ENVOLV MIN	3.525	-62.110	0.000	-1.526	11.286
N:+6.00	B115	ENVOLV MIN	7.050	-29.620	0.000	-1.526	-147.645
N:+2.75	B115	ENVOLV MAX	0.000	-38.880	0.000	25.677	27.09
N:+2.75	B115	ENVOLV MAX	3.375	0.640	0.000	25.677	151.005
N:+2.75	B115	ENVOLV MAX	3.375	81.380	0.000	-0.107	152.447
N:+2.75	B115	ENVOLV MAX	3.525	82.430	0.000	-0.107	144.416
N:+2.75	B115	ENVOLV MAX	7.050	152.940	0.000	-0.107	111.108
N:+2.75	B115	ENVOLV MIN	0.000	-189.860	0.000	1.777	-404.447
N:+2.75	B115	ENVOLV MIN	3.375	-126.900	0.000	1.777	70.691
N:+2.75	B115	ENVOLV MIN	3.375	-34.010	0.000	-29.877	68.312
N:+2.75	B115	ENVOLV MIN	3.525	-33.250	0.000	-29.877	69.672
N:+2.75	B115	ENVOLV MIN	7.050	10.750	0.000	-29.877	-278.169
N:+9.25	B116	ENVOLV MAX	0.000	6.850	0.000	1.086	36.133
N:+9.25	B116	ENVOLV MAX	2.825	16.730	0.000	1.086	9.15
N:+9.25	B116	ENVOLV MAX	5.650	28.930	0.000	1.086	38.71
N:+9.25	B116	ENVOLV MIN	0.000	-27.280	0.000	-1.149	-50.678
N:+9.25	B116	ENVOLV MIN	2.825	-15.800	0.000	-1.149	3.843
N:+9.25	B116	ENVOLV MIN	5.650	-6.640	0.000	-1.149	-58.513
N:+6.00	B116	ENVOLV MAX	0.000	14.520	0.000	1.407	55.116
N:+6.00	B116	ENVOLV MAX	2.825	23.670	0.000	1.407	1.192
N:+6.00	B116	ENVOLV MAX	5.650	32.820	0.000	1.407	86.672
N:+6.00	B116	ENVOLV MIN	0.000	-50.130	0.000	-0.323	-127.612
N:+6.00	B116	ENVOLV MIN	2.825	-37.930	0.000	-0.323	-3.251
N:+6.00	B116	ENVOLV MIN	5.650	-25.720	0.000	-0.323	-78.626
N:+2.75	B116	ENVOLV MAX	0.000	33.640	0.000	0.912	107.294
N:+2.75	B116	ENVOLV MAX	2.825	43.160	0.000	0.912	-0.655
N:+2.75	B116	ENVOLV MAX	5.650	55.360	0.000	0.912	90.295
N:+2.75	B116	ENVOLV MIN	0.000	-53.920	0.000	-1.965	-156.717
N:+2.75	B116	ENVOLV MIN	2.825	-42.080	0.000	-1.965	-21.653
N:+2.75	B116	ENVOLV MIN	5.650	-32.930	0.000	-1.965	-145.822
N:+9.25	B118	ENVOLV MAX	0.000	16.160	0.000	1.634	121.159
N:+9.25	B118	ENVOLV MAX	3.525	45.060	0.000	1.634	24.763
N:+9.25	B118	ENVOLV MAX	7.050	79.270	0.000	1.634	46.004
N:+9.25	B118	ENVOLV MIN	0.000	-47.280	0.000	-0.811	-95.239
N:+9.25	B118	ENVOLV MIN	3.525	-20.030	0.000	-0.811	13.536
N:+9.25	B118	ENVOLV MIN	7.050	1.890	0.000	-0.811	-196.488
N:+6.00	B118	ENVOLV MAX	0.000	10.460	0.000	5.771	149.44
N:+6.00	B118	ENVOLV MAX	2.375	36.730	0.000	5.771	107.539

N:+6.00	B118	ENVOLV MAX	2.375	52.050	0.000	6.091	108.155
N:+6.00	B118	ENVOLV MAX	3.525	70.080	0.000	6.091	40.731
N:+6.00	B118	ENVOLV MAX	7.050	125.350	0.000	6.091	61.997
N:+6.00	B118	ENVOLV MIN	0.000	-90.130	0.000	-20.429	-171.658
N:+6.00	B118	ENVOLV MIN	2.375	-54.790	0.000	-20.429	-13.704
N:+6.00	B118	ENVOLV MIN	2.375	-39.930	0.000	-5.590	-13.304
N:+6.00	B118	ENVOLV MIN	3.525	-28.120	0.000	-5.590	23.45
N:+6.00	B118	ENVOLV MIN	7.050	8.060	0.000	-5.590	-307.337
N:+2.75	B118	ENVOLV MAX	0.000	-9.280	0.000	32.792	101.389
N:+2.75	B118	ENVOLV MAX	2.375	13.280	0.000	32.792	131.12
N:+2.75	B118	ENVOLV MAX	2.375	29.680	0.000	52.304	131.146
N:+2.75	B118	ENVOLV MAX	3.525	38.700	0.000	52.304	106.061
N:+2.75	B118	ENVOLV MAX	3.675	39.400	0.000	52.304	108.012
N:+2.75	B118	ENVOLV MAX	3.675	111.720	0.000	-2.926	107.528
N:+2.75	B118	ENVOLV MAX	7.050	155.310	0.000	-2.926	37.995
N:+2.75	B118	ENVOLV MIN	0.000	-125.220	0.000	-16.429	-231.013
N:+2.75	B118	ENVOLV MIN	2.375	-90.070	0.000	-16.429	1.175
N:+2.75	B118	ENVOLV MIN	2.375	-67.520	0.000	24.734	1.272
N:+2.75	B118	ENVOLV MIN	3.525	-53.820	0.000	24.734	61.157
N:+2.75	B118	ENVOLV MIN	3.675	-52.860	0.000	24.734	55.307
N:+2.75	B118	ENVOLV MIN	3.675	-4.630	0.000	-41.009	56.636
N:+2.75	B118	ENVOLV MIN	7.050	23.790	0.000	-41.009	-357.769
N:+6.00	B119	ENVOLV MAX	0.000	4.800	0.000	1.411	48.21
N:+6.00	B119	ENVOLV MAX	3.988	18.520	0.000	1.411	11.299
N:+6.00	B119	ENVOLV MAX	7.975	35.740	0.000	1.411	44.816
N:+6.00	B119	ENVOLV MIN	0.000	-31.740	0.000	-0.213	-81.363
N:+6.00	B119	ENVOLV MIN	3.988	-15.310	0.000	-0.213	2.861
N:+6.00	B119	ENVOLV MIN	7.975	-2.390	0.000	-0.213	-103.548
N:+2.75	B119	ENVOLV MAX	0.000	-44.640	0.000	3.015	-9.487
N:+2.75	B119	ENVOLV MAX	3.988	6.710	0.000	3.015	126.437
N:+2.75	B119	ENVOLV MAX	3.988	49.430	0.000	21.314	126.686
N:+2.75	B119	ENVOLV MAX	7.975	125.820	0.000	21.314	-2.293
N:+2.75	B119	ENVOLV MIN	0.000	-126.300	0.000	-20.939	-227.084
N:+2.75	B119	ENVOLV MIN	3.988	-49.940	0.000	-20.939	65.86
N:+2.75	B119	ENVOLV MIN	3.988	-5.480	0.000	-4.897	66.436
N:+2.75	B119	ENVOLV MIN	7.975	45.880	0.000	-4.897	-236.937
N:+6.00	B167	ENVOLV MAX	0.000	13.360	0.000	14.320	1.926
N:+6.00	B167	ENVOLV MAX	0.725	21.770	0.000	14.320	-4.692
N:+6.00	B167	ENVOLV MAX	0.725	43.110	0.000	21.134	-3.913
N:+6.00	B167	ENVOLV MAX	1.225	48.910	0.000	21.134	-13.564
N:+6.00	B167	ENVOLV MAX	2.450	63.120	0.000	21.134	-41.246
N:+6.00	B167	ENVOLV MIN	0.000	4.540	0.000	-1.782	-0.228
N:+6.00	B167	ENVOLV MIN	0.725	9.490	0.000	-1.782	-11.426
N:+6.00	B167	ENVOLV MIN	0.725	15.000	0.000	-8.155	-10.387
N:+6.00	B167	ENVOLV MIN	1.225	18.410	0.000	-8.155	-32.096
N:+6.00	B167	ENVOLV MIN	2.450	26.780	0.000	-8.155	-100.713
N:+2.75	B167	ENVOLV MAX	0.000	62.840	0.000	33.632	5.261
N:+2.75	B167	ENVOLV MAX	1.225	86.590	0.000	33.632	-20.855
N:+2.75	B167	ENVOLV MAX	2.450	111.290	0.000	33.632	-56.047
N:+2.75	B167	ENVOLV MIN	0.000	13.360	0.000	-9.034	0.465
N:+2.75	B167	ENVOLV MIN	1.225	23.130	0.000	-9.034	-83.113
N:+2.75	B167	ENVOLV MIN	2.450	32.900	0.000	-9.034	-207.76
N:+6.00	B168	ENVOLV MAX	0.000	23.700	0.000	12.903	0.305
N:+6.00	B168	ENVOLV MAX	0.725	32.980	0.000	12.903	-12.354
N:+6.00	B168	ENVOLV MAX	0.725	56.280	0.000	31.836	-12.328
N:+6.00	B168	ENVOLV MAX	1.225	62.470	0.000	31.836	-30.327
N:+6.00	B168	ENVOLV MAX	2.450	83.580	0.000	31.836	-82.823
N:+6.00	B168	ENVOLV MIN	0.000	14.190	0.000	-4.610	-0.165
N:+6.00	B168	ENVOLV MIN	0.725	19.960	0.000	-4.610	-20.184
N:+6.00	B168	ENVOLV MIN	0.725	34.000	0.000	-13.988	-19.946
N:+6.00	B168	ENVOLV MIN	1.225	37.980	0.000	-13.988	-49.635
N:+6.00	B168	ENVOLV MIN	2.450	47.730	0.000	-13.988	-137.244
N:+2.75	B168	ENVOLV MAX	0.000	129.080	0.000	34.702	5.763
N:+2.75	B168	ENVOLV MAX	1.225	154.280	0.000	34.702	-58.902
N:+2.75	B168	ENVOLV MAX	2.450	179.480	0.000	34.702	-134.99
N:+2.75	B168	ENVOLV MIN	0.000	46.500	0.000	-20.702	2.358
N:+2.75	B168	ENVOLV MIN	1.225	56.400	0.000	-20.702	-164.09
N:+2.75	B168	ENVOLV MIN	2.450	66.290	0.000	-20.702	-372.218
N:+9.25	B169	ENVOLV MAX	0.000	7.870	0.000	8.903	-0.269
N:+9.25	B169	ENVOLV MAX	0.725	13.280	0.000	8.903	-4.297
N:+9.25	B169	ENVOLV MAX	0.725	21.470	0.000	19.176	-4.687
N:+9.25	B169	ENVOLV MAX	1.225	26.470	0.000	19.176	-10.358
N:+9.25	B169	ENVOLV MAX	2.450	38.710	0.000	19.176	-30.921
N:+9.25	B169	ENVOLV MIN	0.000	3.400	0.000	-2.230	-0.687
N:+9.25	B169	ENVOLV MIN	0.725	7.330	0.000	-2.230	-8.158

N:+9.25	B169	ENVOLV MIN	0.725	9.760	0.000	-7.594	-8.688
N:+9.25	B169	ENVOLV MIN	1.225	12.920	0.000	-7.594	-20.673
N:+9.25	B169	ENVOLV MIN	2.450	20.650	0.000	-7.594	-60.592
N:+6.00	B169	ENVOLV MAX	0.000	40.860	0.000	18.511	1.509
N:+6.00	B169	ENVOLV MAX	0.725	57.090	0.000	18.511	-13.608
N:+6.00	B169	ENVOLV MAX	0.725	67.650	0.000	10.264	-13.482
N:+6.00	B169	ENVOLV MAX	1.225	82.550	0.000	10.264	-31.451
N:+6.00	B169	ENVOLV MAX	2.450	113.670	0.000	10.264	-89.477
N:+6.00	B169	ENVOLV MIN	0.000	16.130	0.000	-12.982	0.667
N:+6.00	B169	ENVOLV MIN	0.725	24.570	0.000	-12.982	-33.722
N:+6.00	B169	ENVOLV MIN	0.725	32.620	0.000	-32.360	-33.203
N:+6.00	B169	ENVOLV MIN	1.225	39.380	0.000	-32.360	-70.626
N:+6.00	B169	ENVOLV MIN	2.450	54.590	0.000	-32.360	-192.663
N:+2.75	B169	ENVOLV MAX	0.000	104.760	0.000	17.255	4.695
N:+2.75	B169	ENVOLV MAX	1.225	129.960	0.000	17.255	-45.662
N:+2.75	B169	ENVOLV MAX	2.450	155.150	0.000	17.255	-107.909
N:+2.75	B169	ENVOLV MIN	0.000	35.200	0.000	-45.504	1.942
N:+2.75	B169	ENVOLV MIN	1.225	45.100	0.000	-45.504	-135.363
N:+2.75	B169	ENVOLV MIN	2.450	54.990	0.000	-45.504	-313.695
N:+9.25	B170	ENVOLV MAX	0.000	22.480	0.000	10.797	0.473
N:+9.25	B170	ENVOLV MAX	0.725	28.600	0.000	10.797	-11.206
N:+9.25	B170	ENVOLV MAX	0.725	51.470	0.000	25.012	-11.023
N:+9.25	B170	ENVOLV MAX	1.225	57.460	0.000	25.012	-27.591
N:+9.25	B170	ENVOLV MAX	2.450	77.860	0.000	25.012	-76.312
N:+9.25	B170	ENVOLV MIN	0.000	13.750	0.000	-1.109	0.181
N:+9.25	B170	ENVOLV MIN	0.725	17.680	0.000	-1.109	-18.079
N:+9.25	B170	ENVOLV MIN	0.725	31.200	0.000	-6.073	-17.659
N:+9.25	B170	ENVOLV MIN	1.225	35.050	0.000	-6.073	-44.893
N:+9.25	B170	ENVOLV MIN	2.450	44.490	0.000	-6.073	-126.306
N:+6.00	B170	ENVOLV MAX	0.000	107.920	0.000	36.592	5.241
N:+6.00	B170	ENVOLV MAX	1.225	133.120	0.000	36.592	-47.736
N:+6.00	B170	ENVOLV MAX	2.450	158.310	0.000	36.592	-112.139
N:+6.00	B170	ENVOLV MIN	0.000	36.960	0.000	-8.081	2.135
N:+6.00	B170	ENVOLV MIN	1.225	46.860	0.000	-8.081	-138.689
N:+6.00	B170	ENVOLV MIN	2.450	56.750	0.000	-8.081	-320.895
N:+2.75	B170	ENVOLV MAX	0.000	101.670	0.000	48.118	4.499
N:+2.75	B170	ENVOLV MAX	1.225	126.870	0.000	48.118	-44.845
N:+2.75	B170	ENVOLV MAX	2.450	152.070	0.000	48.118	-106.132
N:+2.75	B170	ENVOLV MIN	0.000	34.420	0.000	-16.841	1.886
N:+2.75	B170	ENVOLV MIN	1.225	44.320	0.000	-16.841	-131.778
N:+2.75	B170	ENVOLV MIN	2.450	54.210	0.000	-16.841	-306.33
N:+9.25	B171	ENVOLV MAX	0.000	27.520	0.000	5.795	0.393
N:+9.25	B171	ENVOLV MAX	0.725	33.640	0.000	5.795	-13.962
N:+9.25	B171	ENVOLV MAX	0.725	61.040	0.000	14.203	-13.714
N:+9.25	B171	ENVOLV MAX	1.225	67.410	0.000	14.203	-34.323
N:+9.25	B171	ENVOLV MAX	2.450	90.380	0.000	14.203	-93.449
N:+9.25	B171	ENVOLV MIN	0.000	17.630	0.000	-5.802	0.16
N:+9.25	B171	ENVOLV MIN	0.725	21.560	0.000	-5.802	-21.837
N:+9.25	B171	ENVOLV MIN	0.725	39.130	0.000	-14.367	-21.522
N:+9.25	B171	ENVOLV MIN	1.225	43.220	0.000	-14.367	-53.637
N:+9.25	B171	ENVOLV MIN	2.450	53.250	0.000	-14.367	-148.27
N:+6.00	B171	ENVOLV MAX	0.000	142.440	0.000	16.120	6.109
N:+6.00	B171	ENVOLV MAX	1.225	167.640	0.000	16.120	-65.09
N:+6.00	B171	ENVOLV MAX	2.450	192.840	0.000	16.120	-147.941
N:+6.00	B171	ENVOLV MIN	0.000	52.020	0.000	-18.547	2.598
N:+6.00	B171	ENVOLV MIN	1.225	61.920	0.000	-18.547	-180.112
N:+6.00	B171	ENVOLV MIN	2.450	71.810	0.000	-18.547	-404.608
N:+2.75	B171	ENVOLV MAX	0.000	143.760	0.000	26.362	6.126
N:+2.75	B171	ENVOLV MAX	1.225	168.960	0.000	26.362	-65.335
N:+2.75	B171	ENVOLV MAX	2.450	194.160	0.000	26.362	-148.494
N:+2.75	B171	ENVOLV MIN	0.000	52.280	0.000	-28.274	2.51
N:+2.75	B171	ENVOLV MIN	1.225	62.170	0.000	-28.274	-181.715
N:+2.75	B171	ENVOLV MIN	2.450	72.060	0.000	-28.274	-407.832
N:+9.25	B172	ENVOLV MAX	0.000	21.040	0.000	1.002	0.674
N:+9.25	B172	ENVOLV MAX	0.725	27.160	0.000	1.002	-10.485
N:+9.25	B172	ENVOLV MAX	0.725	48.870	0.000	6.579	-10.054
N:+9.25	B172	ENVOLV MAX	1.225	54.770	0.000	6.579	-25.938
N:+9.25	B172	ENVOLV MAX	2.450	74.210	0.000	6.579	-72.394
N:+9.25	B172	ENVOLV MIN	0.000	12.880	0.000	-10.261	0.188
N:+9.25	B172	ENVOLV MIN	0.725	16.810	0.000	-10.261	-16.919
N:+9.25	B172	ENVOLV MIN	0.725	29.450	0.000	-23.710	-16.379
N:+9.25	B172	ENVOLV MIN	1.225	33.250	0.000	-23.710	-42.289
N:+9.25	B172	ENVOLV MIN	2.450	42.550	0.000	-23.710	-119.26
N:+6.00	B172	ENVOLV MAX	0.000	118.720	0.000	13.480	3.972
N:+6.00	B172	ENVOLV MAX	1.225	143.920	0.000	13.480	-57.713

N:+6.00	B172	ENVOLV MAX	2.450	169.120	0.000	13.480	-131.525
N:+6.00	B172	ENVOLV MIN	0.000	44.650	0.000	-29.078	1.405
N:+6.00	B172	ENVOLV MIN	1.225	54.540	0.000	-29.078	-153.196
N:+6.00	B172	ENVOLV MIN	2.450	64.440	0.000	-29.078	-348.639
N:+2.75	B172	ENVOLV MAX	0.000	113.750	0.000	22.042	3.218
N:+2.75	B172	ENVOLV MAX	1.225	138.940	0.000	22.042	-53.609
N:+2.75	B172	ENVOLV MAX	2.450	164.140	0.000	22.042	-123.361
N:+2.75	B172	ENVOLV MIN	0.000	41.330	0.000	-38.717	0.871
N:+2.75	B172	ENVOLV MIN	1.225	51.230	0.000	-38.717	-148.223
N:+2.75	B172	ENVOLV MIN	2.450	61.120	0.000	-38.717	-337.567
N:+9.25	B173	ENVOLV MAX	0.000	7.330	0.000	1.438	-0.293
N:+9.25	B173	ENVOLV MAX	0.725	12.630	0.000	1.438	-4.103
N:+9.25	B173	ENVOLV MAX	0.725	20.360	0.000	6.668	-4.588
N:+9.25	B173	ENVOLV MAX	1.225	25.210	0.000	6.668	-9.668
N:+9.25	B173	ENVOLV MAX	2.450	37.100	0.000	6.668	-28.685
N:+9.25	B173	ENVOLV MIN	0.000	3.000	0.000	-9.291	-0.821
N:+9.25	B173	ENVOLV MIN	0.725	6.930	0.000	-9.291	-7.829
N:+9.25	B173	ENVOLV MIN	0.725	8.600	0.000	-19.769	-8.42
N:+9.25	B173	ENVOLV MIN	1.225	11.710	0.000	-19.769	-19.813
N:+9.25	B173	ENVOLV MIN	2.450	19.330	0.000	-19.769	-57.983
N:+6.00	B173	ENVOLV MAX	0.000	47.330	0.000	7.470	0.224
N:+6.00	B173	ENVOLV MAX	0.725	62.750	0.000	7.470	-17.949
N:+6.00	B173	ENVOLV MAX	0.725	71.270	0.000	24.804	-17.553
N:+6.00	B173	ENVOLV MAX	1.225	85.600	0.000	24.804	-37.574
N:+6.00	B173	ENVOLV MAX	2.450	115.340	0.000	24.804	-96.871
N:+6.00	B173	ENVOLV MIN	0.000	20.930	0.000	-22.806	-0.571
N:+6.00	B173	ENVOLV MIN	0.725	29.180	0.000	-22.806	-40.007
N:+6.00	B173	ENVOLV MIN	0.725	33.890	0.000	-19.453	-39.17
N:+6.00	B173	ENVOLV MIN	1.225	40.520	0.000	-19.453	-78.262
N:+6.00	B173	ENVOLV MIN	2.450	55.400	0.000	-19.453	-203.194
N:+2.75	B173	ENVOLV MAX	0.000	95.950	0.000	21.452	1.894
N:+2.75	B173	ENVOLV MAX	1.225	121.150	0.000	21.452	-48.307
N:+2.75	B173	ENVOLV MAX	2.450	146.350	0.000	21.452	-111.733
N:+2.75	B173	ENVOLV MIN	0.000	36.170	0.000	-21.744	0.787
N:+2.75	B173	ENVOLV MIN	1.225	46.060	0.000	-21.744	-127.381
N:+2.75	B173	ENVOLV MIN	2.450	55.960	0.000	-21.744	-294.93
N:+6.00	B174	ENVOLV MAX	0.000	-26.420	0.000	6.426	-40.259
N:+6.00	B174	ENVOLV MAX	1.225	-18.070	0.000	6.426	-12.834
N:+6.00	B174	ENVOLV MAX	1.725	-14.670	0.000	6.426	-2.995
N:+6.00	B174	ENVOLV MAX	1.725	-9.250	0.000	0.633	-4.105
N:+6.00	B174	ENVOLV MAX	2.450	-4.310	0.000	0.633	2.239
N:+6.00	B174	ENVOLV MIN	0.000	-65.730	0.000	-30.913	-105.05
N:+6.00	B174	ENVOLV MIN	1.225	-51.590	0.000	-30.913	-33.371
N:+6.00	B174	ENVOLV MIN	1.725	-45.820	0.000	-30.913	-10.673
N:+6.00	B174	ENVOLV MIN	1.725	-22.220	0.000	-19.724	-11.832
N:+6.00	B174	ENVOLV MIN	2.450	-13.850	0.000	-19.724	-0.184
N:+2.75	B174	ENVOLV MAX	0.000	-34.680	0.000	5.865	-58.994
N:+2.75	B174	ENVOLV MAX	1.225	-24.910	0.000	5.865	-21.622
N:+2.75	B174	ENVOLV MAX	2.450	-15.140	0.000	5.865	5.215
N:+2.75	B174	ENVOLV MIN	0.000	-114.030	0.000	-32.508	-214.249
N:+2.75	B174	ENVOLV MIN	1.225	-89.330	0.000	-32.508	-86.245
N:+2.75	B174	ENVOLV MIN	2.450	-64.650	0.000	-32.508	0.792
N:+6.00	B179	ENVOLV MAX	0.000	-17.160	0.000	0.680	-17.967
N:+6.00	B179	ENVOLV MAX	2.825	1.040	0.000	0.680	8.323
N:+6.00	B179	ENVOLV MAX	5.650	22.090	0.000	0.680	8.751
N:+6.00	B179	ENVOLV MIN	0.000	-37.610	0.000	0.347	-66.636
N:+6.00	B179	ENVOLV MIN	2.825	-13.330	0.000	0.347	3.347
N:+6.00	B179	ENVOLV MIN	5.650	8.090	0.000	0.347	-23.91
N:+2.75	B179	ENVOLV MAX	0.000	-12.620	0.000	0.160	-9.591
N:+2.75	B179	ENVOLV MAX	2.825	5.590	0.000	0.160	0.338
N:+2.75	B179	ENVOLV MAX	5.650	29.050	0.000	0.160	-6.894
N:+2.75	B179	ENVOLV MIN	0.000	-33.380	0.000	-0.037	-70.267
N:+2.75	B179	ENVOLV MIN	2.825	-9.110	0.000	-0.037	-10.717
N:+2.75	B179	ENVOLV MIN	5.650	9.910	0.000	-0.037	-53.073
N:+6.00	B180	ENVOLV MAX	0.000	38.680	0.000	8.416	3.366
N:+6.00	B180	ENVOLV MAX	0.938	44.080	0.000	8.416	-10.332
N:+6.00	B180	ENVOLV MAX	1.875	49.480	0.000	8.416	-25.057
N:+6.00	B180	ENVOLV MIN	0.000	9.630	0.000	-21.993	0.37
N:+6.00	B180	ENVOLV MIN	0.938	13.680	0.000	-21.993	-35.658
N:+6.00	B180	ENVOLV MIN	1.875	17.730	0.000	-21.993	-79.517
N:+2.75	B180	ENVOLV MAX	0.000	62.920	0.000	11.460	5.436
N:+2.75	B180	ENVOLV MAX	0.938	76.040	0.000	11.460	-13.791
N:+2.75	B180	ENVOLV MAX	1.875	89.160	0.000	11.460	-38.062
N:+2.75	B180	ENVOLV MIN	0.000	13.560	0.000	-25.554	0.994
N:+2.75	B180	ENVOLV MIN	0.938	21.090	0.000	-25.554	-59.407

N:+2.75	B180	ENVOLV MIN	1.875	28.620	0.000	-25.554	-137.628
N:+6.00	B181	ENVOLV MAX	0.000	17.560	0.000	16.556	-0.142
N:+6.00	B181	ENVOLV MAX	0.938	21.610	0.000	16.556	-5.04
N:+6.00	B181	ENVOLV MAX	1.875	25.660	0.000	16.556	-12.295
N:+6.00	B181	ENVOLV MIN	0.000	3.180	0.000	-15.076	-1.071
N:+6.00	B181	ENVOLV MIN	0.938	6.220	0.000	-15.076	-18.938
N:+6.00	B181	ENVOLV MIN	1.875	9.260	0.000	-15.076	-41.093
N:+2.75	B181	ENVOLV MAX	0.000	22.640	0.000	18.807	1.981
N:+2.75	B181	ENVOLV MAX	0.938	36.440	0.000	18.807	-8.932
N:+2.75	B181	ENVOLV MAX	1.875	50.250	0.000	18.807	-28.579
N:+2.75	B181	ENVOLV MIN	0.000	6.060	0.000	-16.249	0.196
N:+2.75	B181	ENVOLV MIN	0.938	15.750	0.000	-16.249	-25.892
N:+2.75	B181	ENVOLV MIN	1.875	25.450	0.000	-16.249	-67.112
N:+6.00	B182	ENVOLV MAX	0.000	-15.120	0.000	33.487	-20.446
N:+6.00	B182	ENVOLV MAX	0.938	-11.070	0.000	33.487	-8.166
N:+6.00	B182	ENVOLV MAX	1.875	-7.020	0.000	33.487	3.617
N:+6.00	B182	ENVOLV MIN	0.000	-52.640	0.000	-9.485	-85.199
N:+6.00	B182	ENVOLV MIN	0.938	-47.240	0.000	-9.485	-38.378
N:+6.00	B182	ENVOLV MIN	1.875	-41.840	0.000	-9.485	0.081
N:+2.75	B182	ENVOLV MAX	0.000	-25.510	0.000	29.324	-32.345
N:+2.75	B182	ENVOLV MAX	0.938	-17.980	0.000	29.324	-11.417
N:+2.75	B182	ENVOLV MAX	1.875	-10.440	0.000	29.324	5.855
N:+2.75	B182	ENVOLV MIN	0.000	-91.430	0.000	-16.487	-141.385
N:+2.75	B182	ENVOLV MIN	0.938	-78.310	0.000	-16.487	-60.612
N:+2.75	B182	ENVOLV MIN	1.875	-65.190	0.000	-16.487	0.953
N:+6.00	B183	ENVOLV MAX	0.000	-7.140	0.000	19.357	-8.108
N:+6.00	B183	ENVOLV MAX	0.938	-4.100	0.000	19.357	-2.836
N:+6.00	B183	ENVOLV MAX	1.875	-1.070	0.000	19.357	0.186
N:+6.00	B183	ENVOLV MIN	0.000	-26.400	0.000	-21.993	-41.835
N:+6.00	B183	ENVOLV MIN	0.938	-22.350	0.000	-21.993	-18.987
N:+6.00	B183	ENVOLV MIN	1.875	-18.300	0.000	-21.993	-0.534
N:+2.75	B183	ENVOLV MAX	0.000	-24.120	0.000	21.883	-26.019
N:+2.75	B183	ENVOLV MAX	0.938	-14.430	0.000	21.883	-7.613
N:+2.75	B183	ENVOLV MAX	1.875	-4.730	0.000	21.883	1.909
N:+2.75	B183	ENVOLV MIN	0.000	-51.520	0.000	-22.899	-69.513
N:+2.75	B183	ENVOLV MIN	0.938	-37.720	0.000	-22.899	-27.101
N:+2.75	B183	ENVOLV MIN	1.875	-23.910	0.000	-22.899	0.329
N:+9.25	B187	ENVOLV MAX	0.000	-3.400	0.000	-0.269	2.23
N:+9.25	B187	ENVOLV MAX	3.150	2.340	0.000	-0.269	5.948
N:+9.25	B187	ENVOLV MAX	6.300	10.140	0.000	-0.269	-5.277
N:+9.25	B187	ENVOLV MIN	0.000	-7.870	0.000	-0.687	-8.903
N:+9.25	B187	ENVOLV MIN	3.150	-0.390	0.000	-0.687	2.05
N:+9.25	B187	ENVOLV MIN	6.300	5.040	0.000	-0.687	-13.717
N:+6.00	B189	ENVOLV MAX	0.000	0.720	0.000	-0.096	-0.19
N:+6.00	B189	ENVOLV MAX	0.938	2.240	0.000	-0.096	1.608
N:+6.00	B189	ENVOLV MAX	1.875	4.120	0.000	-0.096	2.638
N:+6.00	B189	ENVOLV MIN	0.000	-4.230	0.000	-2.230	-2.514
N:+6.00	B189	ENVOLV MIN	0.938	-2.210	0.000	-2.230	-2.683
N:+6.00	B189	ENVOLV MIN	1.875	-0.540	0.000	-2.230	-5.407
N:+2.75	B189	ENVOLV MAX	0.000	3.280	0.000	-0.241	-0.545
N:+2.75	B189	ENVOLV MAX	0.938	10.850	0.000	-0.241	4.232
N:+2.75	B189	ENVOLV MAX	1.875	19.290	0.000	-0.241	4.666
N:+2.75	B189	ENVOLV MIN	0.000	-8.580	0.000	-4.193	-3.56
N:+2.75	B189	ENVOLV MIN	0.938	-3.030	0.000	-4.193	-8.685
N:+2.75	B189	ENVOLV MIN	1.875	1.650	0.000	-4.193	-23.436
N:+6.00	B190	ENVOLV MAX	0.000	-4.410	0.000	-0.109	2.691
N:+6.00	B190	ENVOLV MAX	4.050	2.260	0.000	-0.109	9.202
N:+6.00	B190	ENVOLV MAX	8.100	11.010	0.000	-0.109	-5.671
N:+6.00	B190	ENVOLV MIN	0.000	-9.910	0.000	-0.519	-17.997
N:+6.00	B190	ENVOLV MIN	4.050	-1.270	0.000	-0.519	2.476
N:+6.00	B190	ENVOLV MIN	8.100	5.300	0.000	-0.519	-17.668
N:+6.00	B191	ENVOLV MAX	0.000	-7.430	0.000	0.048	-10.066
N:+6.00	B191	ENVOLV MAX	4.950	0.630	0.000	0.048	11.933
N:+6.00	B191	ENVOLV MAX	9.900	12.140	0.000	0.048	-6.307
N:+6.00	B191	ENVOLV MIN	0.000	-12.800	0.000	-0.540	-21.566
N:+6.00	B191	ENVOLV MIN	4.950	-1.020	0.000	-0.540	6.821
N:+6.00	B191	ENVOLV MIN	9.900	7.000	0.000	-0.540	-21.49
N:+6.00	B193	ENVOLV MAX	0.000	6.530	0.000	-0.088	0.589
N:+6.00	B193	ENVOLV MAX	0.938	8.550	0.000	-0.088	0.176
N:+6.00	B193	ENVOLV MAX	1.875	10.580	0.000	-0.088	-0.705
N:+6.00	B193	ENVOLV MIN	0.000	-1.340	0.000	-2.325	-0.408
N:+6.00	B193	ENVOLV MIN	0.938	0.180	0.000	-2.325	-6.524
N:+6.00	B193	ENVOLV MIN	1.875	1.700	0.000	-2.325	-15.492
N:+6.00	B194	ENVOLV MAX	0.000	-3.810	0.000	-0.097	4.879
N:+6.00	B194	ENVOLV MAX	4.050	2.780	0.000	-0.097	9.002

N:+6.00	B194	ENVOLV MAX	8.100	11.520	0.000	-0.097	-2.567
N:+6.00	B194	ENVOLV MIN	0.000	-10.770	0.000	-0.497	-21.518
N:+6.00	B194	ENVOLV MIN	4.050	-2.050	0.000	-0.497	2.416
N:+6.00	B194	ENVOLV MIN	8.100	4.510	0.000	-0.497	-19.96
N:+6.00	B195	ENVOLV MAX	0.000	-6.920	0.000	0.054	-7.931
N:+6.00	B195	ENVOLV MAX	4.950	1.140	0.000	0.054	11.743
N:+6.00	B195	ENVOLV MAX	9.900	12.090	0.000	0.054	-3.362
N:+6.00	B195	ENVOLV MIN	0.000	-12.860	0.000	-0.523	-24.152
N:+6.00	B195	ENVOLV MIN	4.950	-1.590	0.000	-0.523	6.477
N:+6.00	B195	ENVOLV MIN	9.900	6.430	0.000	-0.523	-24.263
N:+6.00	B196	ENVOLV MAX	0.000	-4.470	0.000	0.902	-2.964
N:+6.00	B196	ENVOLV MAX	3.988	1.990	0.000	0.902	6.788
N:+6.00	B196	ENVOLV MAX	7.975	10.470	0.000	0.902	1.516
N:+6.00	B196	ENVOLV MIN	0.000	-10.670	0.000	0.138	-19.368
N:+6.00	B196	ENVOLV MIN	3.988	-2.050	0.000	0.138	1.169
N:+6.00	B196	ENVOLV MIN	7.975	4.540	0.000	0.138	-23.373
N:+6.00	B198	ENVOLV MAX	0.000	1.320	0.000	2.869	3.735
N:+6.00	B198	ENVOLV MAX	0.938	3.080	0.000	2.869	1.788
N:+6.00	B198	ENVOLV MAX	1.875	5.110	0.000	2.869	-0.304
N:+6.00	B198	ENVOLV MIN	0.000	-4.470	0.000	0.208	-6.501
N:+6.00	B198	ENVOLV MIN	0.938	-2.690	0.000	0.208	-3.261
N:+6.00	B198	ENVOLV MIN	1.875	-1.170	0.000	0.208	-3.2
N:+2.75	B198	ENVOLV MAX	0.000	-1.120	0.000	4.144	4.58
N:+2.75	B198	ENVOLV MAX	0.938	3.560	0.000	4.144	3.706
N:+2.75	B198	ENVOLV MAX	1.875	8.990	0.000	4.144	-0.432
N:+2.75	B198	ENVOLV MIN	0.000	-20.280	0.000	0.488	-24.296
N:+2.75	B198	ENVOLV MIN	0.938	-11.840	0.000	0.488	-8.673
N:+2.75	B198	ENVOLV MIN	1.875	-4.150	0.000	0.488	-3.754
N:+6.00	B199	ENVOLV MAX	0.000	-3.300	0.000	0.837	1.714
N:+6.00	B199	ENVOLV MAX	3.988	3.160	0.000	0.837	6.386
N:+6.00	B199	ENVOLV MAX	7.975	11.710	0.000	0.837	4.053
N:+6.00	B199	ENVOLV MIN	0.000	-11.360	0.000	0.113	-22.4
N:+6.00	B199	ENVOLV MIN	3.988	-2.750	0.000	0.113	1.462
N:+6.00	B199	ENVOLV MIN	7.975	3.780	0.000	0.113	-28.023
N:+6.00	B200	ENVOLV MAX	0.000	-1.630	0.000	3.006	-0.655
N:+6.00	B200	ENVOLV MAX	0.938	-0.110	0.000	3.006	0.163
N:+6.00	B200	ENVOLV MAX	1.875	1.410	0.000	3.006	0.702
N:+6.00	B200	ENVOLV MIN	0.000	-11.900	0.000	0.205	-17.919
N:+6.00	B200	ENVOLV MIN	0.938	-9.870	0.000	0.205	-7.712
N:+6.00	B200	ENVOLV MIN	1.875	-7.850	0.000	0.205	-0.550
N:+9.25	B202	ENVOLV MAX	0.000	-2.430	0.000	-0.254	5.364
N:+9.25	B202	ENVOLV MAX	3.150	3.340	0.000	-0.254	6.119
N:+9.25	B202	ENVOLV MAX	6.300	11.150	0.000	-0.254	-3.574
N:+9.25	B202	ENVOLV MIN	0.000	-8.350	0.000	-0.666	-10.273
N:+9.25	B202	ENVOLV MIN	3.150	-0.900	0.000	-0.666	2.117
N:+9.25	B202	ENVOLV MIN	6.300	4.520	0.000	-0.666	-16.708
N:+9.25	B203	ENVOLV MAX	0.000	-7.700	0.000	0.034	-9.412
N:+9.25	B203	ENVOLV MAX	4.950	0.910	0.000	0.034	12.300
N:+9.25	B203	ENVOLV MAX	9.900	13.750	0.000	0.034	-11.934
N:+9.25	B203	ENVOLV MIN	0.000	-12.770	0.000	-0.336	-19.269
N:+9.25	B203	ENVOLV MIN	4.950	-0.190	0.000	-0.336	7.602
N:+9.25	B203	ENVOLV MIN	9.900	8.330	0.000	-0.336	-23.839
N:+9.25	B206	ENVOLV MAX	0.000	-7.470	0.000	0.038	-8.519
N:+9.25	B206	ENVOLV MAX	4.950	1.120	0.000	0.038	12.011
N:+9.25	B206	ENVOLV MAX	9.900	13.700	0.000	0.038	-10.649
N:+9.25	B206	ENVOLV MIN	0.000	-12.810	0.000	-0.331	-21.015
N:+9.25	B206	ENVOLV MIN	4.950	-0.480	0.000	-0.331	7.368
N:+9.25	B206	ENVOLV MIN	9.900	8.040	0.000	-0.331	-25.243
N:+9.25	B208	ENVOLV MAX	0.000	-7.990	0.000	0.284	-10.444
N:+9.25	B208	ENVOLV MAX	4.888	0.430	0.000	0.284	12.041
N:+9.25	B208	ENVOLV MAX	9.775	12.480	0.000	0.284	-7.151
N:+9.25	B208	ENVOLV MIN	0.000	-13.700	0.000	-0.047	-25.292
N:+9.25	B208	ENVOLV MIN	4.888	-1.350	0.000	-0.047	7.411
N:+9.25	B208	ENVOLV MIN	9.775	7.200	0.000	-0.047	-19.577
N:+9.25	B210	ENVOLV MAX	0.000	-3.810	0.000	0.801	-3.012
N:+9.25	B210	ENVOLV MAX	2.825	1.050	0.000	0.801	3.854
N:+9.25	B210	ENVOLV MAX	5.650	7.780	0.000	0.801	5.234
N:+9.25	B210	ENVOLV MIN	0.000	-10.460	0.000	0.276	-15.844
N:+9.25	B210	ENVOLV MIN	2.825	-3.460	0.000	0.276	0.848
N:+9.25	B210	ENVOLV MIN	5.650	1.670	0.000	0.276	-10.483
N:+9.25	B212	ENVOLV MAX	0.000	-8.290	0.000	0.292	-11.789
N:+9.25	B212	ENVOLV MAX	4.888	0.130	0.000	0.292	12.329
N:+9.25	B212	ENVOLV MAX	9.775	12.410	0.000	0.292	-7.977
N:+9.25	B212	ENVOLV MIN	0.000	-13.770	0.000	-0.042	-23.976
N:+9.25	B212	ENVOLV MIN	4.888	-1.150	0.000	-0.042	7.640

N:+9.25	B212	ENVOLV MIN	9.775	7.420	0.000	-0.042	-17.782
N:+9.25	B214	ENVOLV MAX	0.000	-4.360	0.000	0.821	-4.628
N:+9.25	B214	ENVOLV MAX	2.825	0.500	0.000	0.821	3.805
N:+9.25	B214	ENVOLV MAX	5.650	7.330	0.000	0.821	1.438
N:+9.25	B214	ENVOLV MIN	0.000	-9.030	0.000	0.293	-11.872
N:+9.25	B214	ENVOLV MIN	2.825	-2.030	0.000	0.293	0.773
N:+9.25	B214	ENVOLV MIN	5.650	3.000	0.000	0.293	-9.291
N:+6.00	B214	ENVOLV MAX	0.000	-18.680	0.000	1.389	-20.422
N:+6.00	B214	ENVOLV MAX	2.825	-0.320	0.000	1.389	22.441
N:+6.00	B214	ENVOLV MAX	5.650	38.530	0.000	1.389	-6.224
N:+6.00	B214	ENVOLV MIN	0.000	-53.780	0.000	0.198	-73.406
N:+6.00	B214	ENVOLV MIN	2.825	-8.980	0.000	0.198	5.624
N:+6.00	B214	ENVOLV MIN	5.650	12.630	0.000	0.198	-31.444
N:+2.75	B214	ENVOLV MAX	0.000	-15.130	0.000	0.538	-13.646
N:+2.75	B214	ENVOLV MAX	2.825	3.230	0.000	0.538	10.338
N:+2.75	B214	ENVOLV MAX	5.650	43.510	0.000	0.538	-13.033
N:+2.75	B214	ENVOLV MIN	0.000	-48.800	0.000	0.006	-72.594
N:+2.75	B214	ENVOLV MIN	2.825	-6.250	0.000	0.006	0.773
N:+2.75	B214	ENVOLV MIN	5.650	13.300	0.000	0.006	-56.715
N:+6.00	B1	ENVOLV MAX	0.000	-3.180	0.000	-0.142	15.076
N:+6.00	B1	ENVOLV MAX	3.525	8.590	0.000	-0.142	18.798
N:+6.00	B1	ENVOLV MAX	7.050	24.300	0.000	-0.142	5.204
N:+6.00	B1	ENVOLV MIN	0.000	-17.560	0.000	-1.071	-16.556
N:+6.00	B1	ENVOLV MIN	3.525	-3.080	0.000	-1.071	6.569
N:+6.00	B1	ENVOLV MIN	7.050	7.460	0.000	-1.071	-45.512
N:+2.75	B1	ENVOLV MAX	0.000	-6.060	0.000	1.981	16.249
N:+2.75	B1	ENVOLV MAX	3.525	17.260	0.000	1.981	17.031
N:+2.75	B1	ENVOLV MAX	3.675	17.680	0.000	1.981	15.604
N:+2.75	B1	ENVOLV MAX	3.675	9.800	0.000	-0.447	15.706
N:+2.75	B1	ENVOLV MAX	7.050	36.470	0.000	-0.447	6.740
N:+2.75	B1	ENVOLV MIN	0.000	-22.640	0.000	0.196	-18.807
N:+2.75	B1	ENVOLV MIN	3.525	1.460	0.000	0.196	0.293
N:+2.75	B1	ENVOLV MIN	3.675	1.760	0.000	0.196	-1.145
N:+2.75	B1	ENVOLV MIN	3.675	-8.360	0.000	-1.877	-1.853
N:+2.75	B1	ENVOLV MIN	7.050	8.210	0.000	-1.877	-70.709
N:+6.00	B2	ENVOLV MAX	0.000	-1.610	0.000	2.377	-1.380
N:+6.00	B2	ENVOLV MAX	1.225	2.050	0.000	2.377	-0.970
N:+6.00	B2	ENVOLV MAX	1.725	3.550	0.000	2.377	-1.508
N:+6.00	B2	ENVOLV MAX	1.725	-1.450	0.000	2.514	-1.083
N:+6.00	B2	ENVOLV MAX	2.450	0.720	0.000	2.514	-0.096
N:+6.00	B2	ENVOLV MIN	0.000	-14.950	0.000	0.146	-25.350
N:+6.00	B2	ENVOLV MIN	1.225	-9.490	0.000	0.146	-11.059
N:+6.00	B2	ENVOLV MIN	1.725	-7.260	0.000	0.146	-7.732
N:+6.00	B2	ENVOLV MIN	1.725	-7.460	0.000	0.190	-5.744
N:+6.00	B2	ENVOLV MIN	2.450	-4.230	0.000	0.190	-2.230
N:+2.75	B2	ENVOLV MAX	0.000	-5.040	0.000	3.560	-4.607
N:+2.75	B2	ENVOLV MAX	1.225	-0.880	0.000	3.560	-0.199
N:+2.75	B2	ENVOLV MAX	2.450	3.280	0.000	3.560	-0.241
N:+2.75	B2	ENVOLV MIN	0.000	-26.760	0.000	0.545	-45.267
N:+2.75	B2	ENVOLV MIN	1.225	-17.670	0.000	0.545	-17.237
N:+2.75	B2	ENVOLV MIN	2.450	-8.580	0.000	0.545	-4.193
N:+6.00	B10	ENVOLV MAX	0.000	-1.070	0.000	0.534	19.357
N:+6.00	B10	ENVOLV MAX	3.525	11.170	0.000	0.534	15.628
N:+6.00	B10	ENVOLV MAX	7.050	26.880	0.000	0.534	8.241
N:+6.00	B10	ENVOLV MIN	0.000	-18.300	0.000	-0.186	-21.993
N:+6.00	B10	ENVOLV MIN	3.525	-4.290	0.000	-0.186	3.731
N:+6.00	B10	ENVOLV MIN	7.050	6.250	0.000	-0.186	-59.409
N:+2.75	B10	ENVOLV MAX	0.000	-4.730	0.000	-0.329	21.883
N:+2.75	B10	ENVOLV MAX	3.525	18.550	0.000	-0.329	16.816
N:+2.75	B10	ENVOLV MAX	3.675	18.970	0.000	-0.329	15.451
N:+2.75	B10	ENVOLV MAX	3.675	11.350	0.000	2.101	15.437
N:+2.75	B10	ENVOLV MAX	7.050	38.020	0.000	2.101	14.691
N:+2.75	B10	ENVOLV MIN	0.000	-23.910	0.000	-1.909	-22.899
N:+2.75	B10	ENVOLV MIN	3.525	0.220	0.000	-1.909	1.865
N:+2.75	B10	ENVOLV MIN	3.675	0.520	0.000	-1.909	0.358
N:+2.75	B10	ENVOLV MIN	3.675	-10.300	0.000	0.520	-0.688
N:+2.75	B10	ENVOLV MIN	7.050	6.280	0.000	0.520	-76.472
N:+6.00	B11	ENVOLV MAX	0.000	-0.640	0.000	-0.147	1.005
N:+6.00	B11	ENVOLV MAX	1.225	3.030	0.000	-0.147	-0.304
N:+6.00	B11	ENVOLV MAX	1.725	4.520	0.000	-0.147	-1.420
N:+6.00	B11	ENVOLV MAX	1.725	-1.000	0.000	-0.304	-0.887
N:+6.00	B11	ENVOLV MAX	2.450	1.170	0.000	-0.304	-0.208
N:+6.00	B11	ENVOLV MIN	0.000	-15.100	0.000	-3.204	-28.170
N:+6.00	B11	ENVOLV MIN	1.225	-9.640	0.000	-3.204	-13.172
N:+6.00	B11	ENVOLV MIN	1.725	-7.410	0.000	-3.204	-9.679

N:+6.00	B11	ENVOLV MIN	1.725	-8.340	0.000	-3.200	-7.001
N:+6.00	B11	ENVOLV MIN	2.450	-5.110	0.000	-3.200	-2.869
N:+2.75	B11	ENVOLV MAX	0.000	-4.170	0.000	-0.432	-1.732
N:+2.75	B11	ENVOLV MAX	1.225	-0.010	0.000	-0.432	1.229
N:+2.75	B11	ENVOLV MAX	2.450	4.150	0.000	-0.432	-0.488
N:+2.75	B11	ENVOLV MIN	0.000	-27.170	0.000	-3.754	-47.212
N:+2.75	B11	ENVOLV MIN	1.225	-18.080	0.000	-3.754	-18.299
N:+2.75	B11	ENVOLV MIN	2.450	-8.990	0.000	-3.754	-4.144
N:+2.75	B13	ENVOLV MAX	0.000	20.910	0.000	2.930	-1.561
N:+2.75	B13	ENVOLV MAX	1.225	39.350	0.000	2.930	-9.248
N:+2.75	B13	ENVOLV MAX	2.450	61.020	0.000	2.930	-27.535
N:+2.75	B13	ENVOLV MIN	0.000	3.290	0.000	-1.639	-3.831
N:+2.75	B13	ENVOLV MIN	1.225	10.540	0.000	-1.639	-36.954
N:+2.75	B13	ENVOLV MIN	2.450	17.780	0.000	-1.639	-100.239
N:+2.75	B14	ENVOLV MAX	0.000	-34.790	0.000	1.489	-8.051
N:+2.75	B14	ENVOLV MAX	4.050	16.700	0.000	1.489	59.834
N:+2.75	B14	ENVOLV MAX	4.050	17.370	0.000	1.762	59.924
N:+2.75	B14	ENVOLV MAX	8.100	102.280	0.000	1.762	-69.136
N:+2.75	B14	ENVOLV MIN	0.000	-80.410	0.000	-1.470	-112.899
N:+2.75	B14	ENVOLV MIN	4.050	-4.080	0.000	-1.470	28.046
N:+2.75	B14	ENVOLV MIN	4.050	0.720	0.000	-1.292	29.745
N:+2.75	B14	ENVOLV MIN	8.100	48.600	0.000	-1.292	-176.151
N:+2.75	B15	ENVOLV MAX	0.000	-60.490	0.000	1.479	-87.473
N:+2.75	B15	ENVOLV MAX	4.948	5.980	0.000	1.479	94.075
N:+2.75	B15	ENVOLV MAX	4.948	-2.140	0.000	1.532	93.591
N:+2.75	B15	ENVOLV MAX	9.900	113.530	0.000	1.532	-73.062
N:+2.75	B15	ENVOLV MIN	0.000	-119.340	0.000	-1.567	-192.536
N:+2.75	B15	ENVOLV MIN	4.948	-1.050	0.000	-1.567	47.743
N:+2.75	B15	ENVOLV MIN	4.948	-11.070	0.000	-1.449	47.530
N:+2.75	B15	ENVOLV MIN	9.900	57.680	0.000	-1.449	-164.110
N:+6.00	B16	ENVOLV MAX	0.000	-20.960	0.000	1.490	2.446
N:+6.00	B16	ENVOLV MAX	3.148	13.350	0.000	1.490	35.412
N:+6.00	B16	ENVOLV MAX	3.148	25.990	0.000	1.617	34.702
N:+6.00	B16	ENVOLV MAX	6.300	80.940	0.000	1.617	-54.846
N:+6.00	B16	ENVOLV MIN	0.000	-49.200	0.000	-1.498	-42.941
N:+6.00	B16	ENVOLV MIN	3.148	-1.540	0.000	-1.498	15.938
N:+6.00	B16	ENVOLV MIN	3.148	7.900	0.000	-1.374	15.611
N:+6.00	B16	ENVOLV MIN	6.300	38.850	0.000	-1.374	-131.148
N:+2.75	B16	ENVOLV MAX	0.000	-30.970	0.000	1.276	-42.755
N:+2.75	B16	ENVOLV MAX	3.148	-0.090	0.000	1.276	11.785
N:+2.75	B16	ENVOLV MAX	3.148	16.210	0.000	1.437	12.607
N:+2.75	B16	ENVOLV MAX	6.300	67.670	0.000	1.437	-40.173
N:+2.75	B16	ENVOLV MIN	0.000	-69.420	0.000	-1.621	-129.335
N:+2.75	B16	ENVOLV MIN	3.148	-18.090	0.000	-1.621	2.360
N:+2.75	B16	ENVOLV MIN	3.148	-0.470	0.000	-1.532	2.233
N:+2.75	B16	ENVOLV MIN	6.300	30.480	0.000	-1.532	-124.047
N:+6.00	B17	ENVOLV MAX	0.000	-58.060	0.000	1.363	-78.614
N:+6.00	B17	ENVOLV MAX	4.948	10.700	0.000	1.363	88.468
N:+6.00	B17	ENVOLV MAX	4.948	2.520	0.000	1.697	89.148
N:+6.00	B17	ENVOLV MAX	9.900	123.210	0.000	1.697	-102.945
N:+6.00	B17	ENVOLV MIN	0.000	-113.230	0.000	-1.578	-167.882
N:+6.00	B17	ENVOLV MIN	4.948	2.660	0.000	-1.578	45.337
N:+6.00	B17	ENVOLV MIN	4.948	-2.020	0.000	-1.399	45.450
N:+6.00	B17	ENVOLV MIN	9.900	63.260	0.000	-1.399	-216.461
N:+2.75	B17	ENVOLV MAX	0.000	-56.010	0.000	1.493	-68.227
N:+2.75	B17	ENVOLV MAX	4.948	13.270	0.000	1.493	89.352
N:+2.75	B17	ENVOLV MAX	4.948	4.220	0.000	1.790	90.230
N:+2.75	B17	ENVOLV MAX	9.900	123.790	0.000	1.790	-96.736
N:+2.75	B17	ENVOLV MIN	0.000	-111.890	0.000	-1.529	-160.814
N:+2.75	B17	ENVOLV MIN	4.948	1.870	0.000	-1.529	45.843
N:+2.75	B17	ENVOLV MIN	4.948	-2.870	0.000	-1.630	45.087
N:+2.75	B17	ENVOLV MIN	9.900	62.410	0.000	-1.630	-218.270
N:+6.00	B18	ENVOLV MAX	0.000	-62.890	0.000	1.412	-102.540
N:+6.00	B18	ENVOLV MAX	4.885	1.100	0.000	1.412	88.445
N:+6.00	B18	ENVOLV MAX	4.885	-6.270	0.000	1.766	86.790
N:+6.00	B18	ENVOLV MAX	9.775	103.580	0.000	1.766	-54.341
N:+6.00	B18	ENVOLV MIN	0.000	-122.570	0.000	-1.600	-215.964
N:+6.00	B18	ENVOLV MIN	4.885	-4.210	0.000	-1.600	44.647
N:+6.00	B18	ENVOLV MIN	4.885	-17.800	0.000	-1.591	44.165
N:+6.00	B18	ENVOLV MIN	9.775	52.530	0.000	-1.591	-124.623
N:+2.75	B18	ENVOLV MAX	0.000	-62.070	0.000	1.639	-95.878
N:+2.75	B18	ENVOLV MAX	4.885	1.920	0.000	1.639	90.690
N:+2.75	B18	ENVOLV MAX	4.885	-4.180	0.000	1.834	89.446
N:+2.75	B18	ENVOLV MAX	9.775	103.910	0.000	1.834	-46.217
N:+2.75	B18	ENVOLV MIN	0.000	-123.420	0.000	-1.641	-217.903

N:+2.75	B18	ENVOLV MIN	4.885	-6.300	0.000	-1.641	44.996
N:+2.75	B18	ENVOLV MIN	4.885	-19.150	0.000	-1.958	45.531
N:+2.75	B18	ENVOLV MIN	9.775	51.150	0.000	-1.958	-131.026
N:+2.75	B20	ENVOLV MAX	0.000	-39.800	0.000	1.770	-27.766
N:+2.75	B20	ENVOLV MAX	3.985	8.010	0.000	1.770	78.445
N:+2.75	B20	ENVOLV MAX	3.985	6.320	0.000	1.839	77.948
N:+2.75	B20	ENVOLV MAX	7.975	85.330	0.000	1.839	-16.167
N:+2.75	B20	ENVOLV MIN	0.000	-84.240	0.000	-1.617	-92.498
N:+2.75	B20	ENVOLV MIN	3.985	-4.100	0.000	-1.617	37.691
N:+2.75	B20	ENVOLV MIN	3.985	-8.720	0.000	-1.962	35.499
N:+2.75	B20	ENVOLV MIN	7.975	38.910	0.000	-1.962	-111.531
N:+2.75	B21	ENVOLV MAX	0.000	19.220	0.000	2.729	-0.768
N:+2.75	B21	ENVOLV MAX	0.938	29.370	0.000	2.729	-2.147
N:+2.75	B21	ENVOLV MAX	1.875	39.520	0.000	2.729	-10.526
N:+2.75	B21	ENVOLV MIN	0.000	-1.220	0.000	-2.123	-3.734
N:+2.75	B21	ENVOLV MIN	0.938	5.080	0.000	-2.123	-25.104
N:+2.75	B21	ENVOLV MIN	1.875	11.370	0.000	-2.123	-58.561
N:+2.75	B22	ENVOLV MAX	0.000	-12.480	0.000	2.402	-12.890
N:+2.75	B22	ENVOLV MAX	0.938	-6.180	0.000	2.402	-3.478
N:+2.75	B22	ENVOLV MAX	1.875	0.120	0.000	2.402	-0.994
N:+2.75	B22	ENVOLV MIN	0.000	-38.850	0.000	-3.461	-57.369
N:+2.75	B22	ENVOLV MIN	0.938	-28.700	0.000	-3.461	-24.538
N:+2.75	B22	ENVOLV MIN	1.875	-18.550	0.000	-3.461	-3.865
N:+2.75	B24	ENVOLV MAX	0.000	20.750	0.000	1.904	-2.079
N:+2.75	B24	ENVOLV MAX	1.225	41.450	0.000	1.904	-11.772
N:+2.75	B24	ENVOLV MAX	2.450	63.120	0.000	1.904	-32.223
N:+2.75	B24	ENVOLV MIN	0.000	5.050	0.000	-2.113	-4.701
N:+2.75	B24	ENVOLV MIN	1.225	12.3	0	-2.113	-38.402
N:+2.75	B24	ENVOLV MIN	2.45	19.55	0	-2.113	-106.157
N:+6.00	B26	ENVOLV MAX	0	19.5	0	2.638	-1.848
N:+6.00	B26	ENVOLV MAX	1.225	36.66	0	2.638	-8.256
N:+6.00	B26	ENVOLV MAX	2.45	57.93	0	2.638	-25.416
N:+6.00	B26	ENVOLV MIN	0.000	2.370	0.000	-1.114	-4.048
N:+6.00	B26	ENVOLV MIN	1.225	9.620	0.000	-1.114	-35.305
N:+6.00	B26	ENVOLV MIN	2.450	16.870	0.000	-1.114	-93.518
N:+2.75	B26	ENVOLV MAX	0.000	18.870	0.000	2.229	-2.148
N:+2.75	B26	ENVOLV MAX	1.225	36.030	0.000	2.229	-7.212
N:+2.75	B26	ENVOLV MAX	2.450	56.850	0.000	2.229	-23.020
N:+2.75	B26	ENVOLV MIN	0.000	1.260	0.000	-2.412	-5.426
N:+2.75	B26	ENVOLV MIN	1.225	8.510	0.000	-2.412	-35.376
N:+2.75	B26	ENVOLV MIN	2.450	15.760	0.000	-2.412	-92.817
N:+6.00	B28	ENVOLV MAX	0.000	20.310	0.000	1.400	-2.220
N:+6.00	B28	ENVOLV MAX	1.225	41.120	0.000	1.400	-12.251
N:+6.00	B28	ENVOLV MAX	2.450	62.790	0.000	1.400	-33.041
N:+6.00	B28	ENVOLV MIN	0.000	5.330	0.000	-1.266	-5.037
N:+6.00	B28	ENVOLV MIN	1.225	12.580	0.000	-1.266	-38.436
N:+6.00	B28	ENVOLV MIN	2.450	19.830	0.000	-1.266	-105.791
N:+2.75	B28	ENVOLV MAX	0.000	20.150	0.000	2.294	-2.112
N:+2.75	B28	ENVOLV MAX	1.225	40.570	0.000	2.294	-11.459
N:+2.75	B28	ENVOLV MAX	2.450	62.240	0.000	2.294	-31.561
N:+2.75	B28	ENVOLV MIN	0.000	4.770	0.000	-1.973	-4.926
N:+2.75	B28	ENVOLV MIN	1.225	12.020	0.000	-1.973	-37.570
N:+2.75	B28	ENVOLV MIN	2.450	19.270	0.000	-1.973	-104.244
N:+6.00	B30	ENVOLV MAX	0.000	20.570	0.000	1.392	-2.362
N:+6.00	B30	ENVOLV MAX	1.225	41.000	0.000	1.392	-11.963
N:+6.00	B30	ENVOLV MAX	2.450	62.670	0.000	1.392	-32.322
N:+6.00	B30	ENVOLV MIN	0.000	4.980	0.000	-1.318	-5.780
N:+6.00	B30	ENVOLV MIN	1.225	12.230	0.000	-1.318	-38.962
N:+6.00	B30	ENVOLV MIN	2.450	19.480	0.000	-1.318	-106.170
N:+2.75	B30	ENVOLV MAX	0.000	20.750	0.000	2.053	-2.204
N:+2.75	B30	ENVOLV MAX	1.225	40.320	0.000	2.053	-10.587
N:+2.75	B30	ENVOLV MAX	2.450	61.990	0.000	2.053	-29.728
N:+2.75	B30	ENVOLV MIN	0.000	3.990	0.000	-2.112	-5.690
N:+2.75	B30	ENVOLV MIN	1.225	11.230	0.000	-2.112	-38.835
N:+2.75	B30	ENVOLV MIN	2.450	18.480	0.000	-2.112	-104.339
N:+2.75	B32	ENVOLV MAX	0.000	22.990	0.000	1.267	-1.168
N:+2.75	B32	ENVOLV MAX	1.225	40.900	0.000	1.267	-8.850
N:+2.75	B32	ENVOLV MAX	2.450	62.570	0.000	1.267	-27.151
N:+2.75	B32	ENVOLV MIN	0.000	3.300	0.000	-2.233	-3.399
N:+2.75	B32	ENVOLV MIN	1.225	10.550	0.000	-2.233	-39.153
N:+2.75	B32	ENVOLV MIN	2.450	17.800	0.000	-2.233	-103.333
N:+2.75	B41	ENVOLV MAX	0.000	-11.710	0.000	1.078	13.165
N:+2.75	B41	ENVOLV MAX	2.025	0.800	0.000	1.078	38.359
N:+2.75	B41	ENVOLV MAX	4.050	19.420	0.000	1.078	24.810

N:+2.75	B41	ENVOLV MIN	0.000	-45.540	0.000	0.214	-56.532
N:+2.75	B41	ENVOLV MIN	2.025	-18.230	0.000	0.214	-2.614
N:+2.75	B41	ENVOLV MIN	4.050	0.990	0.000	0.214	2.414
N:+2.75	B42	ENVOLV MAX	0.000	2.940	0.000	-1.182	23.341
N:+2.75	B42	ENVOLV MAX	2.025	28.330	0.000	-1.182	7.458
N:+2.75	B42	ENVOLV MAX	4.050	58.850	0.000	-1.182	-20.588
N:+2.75	B42	ENVOLV MIN	0.000	-6.740	0.000	-3.092	2.592
N:+2.75	B42	ENVOLV MIN	2.025	6.320	0.000	-3.092	-6.625
N:+2.75	B42	ENVOLV MIN	4.050	18.830	0.000	-3.092	-92.358
N:+2.75	B56	ENVOLV MAX	0.000	27.530	0.000	0.919	58.064
N:+2.75	B56	ENVOLV MAX	1.687	56.540	0.000	0.919	27.086
N:+2.75	B56	ENVOLV MAX	3.375	85.550	0.000	0.919	-21.407
N:+2.75	B56	ENVOLV MIN	0.000	0.200	0.000	-1.190	28.714
N:+2.75	B56	ENVOLV MIN	1.687	17.680	0.000	-1.190	-15.643
N:+2.75	B56	ENVOLV MIN	3.375	35.170	0.000	-1.190	-142.311
N:+6.00	B59	ENVOLV MAX	0.000	-30.190	0.000	1.689	2.584
N:+6.00	B59	ENVOLV MAX	1.838	-9.810	0.000	1.689	68.364
N:+6.00	B59	ENVOLV MAX	3.675	14.950	0.000	1.689	71.862
N:+6.00	B59	ENVOLV MIN	0.000	-64.310	0.000	-0.498	-37.355
N:+6.00	B59	ENVOLV MIN	1.838	-28.540	0.000	-0.498	31.149
N:+6.00	B59	ENVOLV MIN	3.675	1.010	0.000	-0.498	38.469
N:+2.75	B59	ENVOLV MAX	0.000	-29.450	0.000	2.117	3.941
N:+2.75	B59	ENVOLV MAX	1.838	-9.070	0.000	2.117	67.951
N:+2.75	B59	ENVOLV MAX	3.675	15.570	0.000	2.117	70.852
N:+2.75	B59	ENVOLV MIN	0.000	-64.480	0.000	-1.246	-40.999
N:+2.75	B59	ENVOLV MIN	1.838	-29.340	0.000	-1.246	29.241
N:+2.75	B59	ENVOLV MIN	3.675	0.330	0.000	-1.246	37.051
N:+6.00	B60	ENVOLV MAX	0.000	30.010	0.000	0.399	70.497
N:+6.00	B60	ENVOLV MAX	1.687	59.110	0.000	0.399	23.467
N:+6.00	B60	ENVOLV MAX	3.375	91.540	0.000	0.399	-36.327
N:+6.00	B60	ENVOLV MIN	0.000	6.900	0.000	-1.689	36.178
N:+6.00	B60	ENVOLV MIN	1.687	24.380	0.000	-1.689	-8.508
N:+6.00	B60	ENVOLV MIN	3.375	41.870	0.000	-1.689	-139.365
N:+2.75	B60	ENVOLV MAX	0.000	29.810	0.000	1.061	69.812
N:+2.75	B60	ENVOLV MAX	1.687	58.810	0.000	1.061	27.026
N:+2.75	B60	ENVOLV MAX	3.375	90.190	0.000	1.061	-30.226
N:+2.75	B60	ENVOLV MIN	0.000	5.040	0.000	-1.978	34.569
N:+2.75	B60	ENVOLV MIN	1.687	22.530	0.000	-1.978	-10.177
N:+2.75	B60	ENVOLV MIN	3.375	40.010	0.000	-1.978	-140.099
N:+6.00	B63	ENVOLV MAX	0.000	-29.520	0.000	0.814	1.773
N:+6.00	B63	ENVOLV MAX	1.838	-9.140	0.000	0.814	65.846
N:+6.00	B63	ENVOLV MAX	3.675	16.410	0.000	0.814	65.154
N:+6.00	B63	ENVOLV MIN	0.000	-62.030	0.000	-1.299	-34.030
N:+6.00	B63	ENVOLV MIN	1.838	-25.890	0.000	-1.299	30.528
N:+6.00	B63	ENVOLV MIN	3.675	2.860	0.000	-1.299	35.342
N:+2.75	B63	ENVOLV MAX	0.000	-29.720	0.000	1.387	1.586
N:+2.75	B63	ENVOLV MAX	1.838	-9.340	0.000	1.387	65.641
N:+2.75	B63	ENVOLV MAX	3.675	15.770	0.000	1.387	67.008
N:+2.75	B63	ENVOLV MIN	0.000	-63.150	0.000	-2.054	-37.011
N:+2.75	B63	ENVOLV MIN	1.838	-27.150	0.000	-2.054	29.882
N:+2.75	B63	ENVOLV MIN	3.675	2.040	0.000	-2.054	35.899
N:+6.00	B64	ENVOLV MAX	0.000	26.350	0.000	1.269	63.591
N:+6.00	B64	ENVOLV MAX	1.687	55.730	0.000	1.269	21.010
N:+6.00	B64	ENVOLV MAX	3.375	88.160	0.000	1.269	-36.892
N:+6.00	B64	ENVOLV MIN	0.000	5.780	0.000	-0.724	33.322
N:+6.00	B64	ENVOLV MIN	1.687	23.260	0.000	-0.724	-7.810
N:+6.00	B64	ENVOLV MIN	3.375	40.750	0.000	-0.724	-132.493
N:+2.75	B64	ENVOLV MAX	0.000	26.470	0.000	1.811	65.636
N:+2.75	B64	ENVOLV MAX	1.687	55.470	0.000	1.811	23.796
N:+2.75	B64	ENVOLV MAX	3.375	87.790	0.000	1.811	-33.566
N:+2.75	B64	ENVOLV MIN	0.000	5.130	0.000	-1.214	33.801
N:+2.75	B64	ENVOLV MIN	1.687	22.610	0.000	-1.214	-7.159
N:+2.75	B64	ENVOLV MIN	3.375	40.100	0.000	-1.214	-131.478
N:+6.00	B69	ENVOLV MAX	0.000	-29.440	0.000	0.822	-19.087
N:+6.00	B69	ENVOLV MAX	1.687	-12.020	0.000	0.822	19.797
N:+6.00	B69	ENVOLV MAX	3.375	5.410	0.000	0.822	32.335
N:+6.00	B69	ENVOLV MIN	0.000	-75.080	0.000	-1.284	-130.331
N:+6.00	B69	ENVOLV MIN	1.687	-46.180	0.000	-1.284	-21.379
N:+6.00	B69	ENVOLV MIN	3.375	-17.280	0.000	-1.284	14.651
N:+2.75	B69	ENVOLV MAX	0.000	-26.150	0.000	1.804	-11.815
N:+2.75	B69	ENVOLV MAX	1.687	-8.730	0.000	1.804	21.473
N:+2.75	B69	ENVOLV MAX	3.375	8.690	0.000	1.804	25.365
N:+2.75	B69	ENVOLV MIN	0.000	-70.840	0.000	-1.433	-123.280
N:+2.75	B69	ENVOLV MIN	1.687	-41.940	0.000	-1.433	-21.435
N:+2.75	B69	ENVOLV MIN	3.375	-13.040	0.000	-1.433	10.541

N:+6.00	B71	ENVOLV MAX	0.000	-6.850	0.000	1.330	31.589
N:+6.00	B71	ENVOLV MAX	1.838	17.450	0.000	1.330	55.666
N:+6.00	B71	ENVOLV MAX	3.675	50.790	0.000	1.330	10.093
N:+6.00	B71	ENVOLV MIN	0.000	-27.110	0.000	-0.755	16.851
N:+6.00	B71	ENVOLV MIN	1.838	1.980	0.000	-0.755	17.950
N:+6.00	B71	ENVOLV MIN	3.675	22.020	0.000	-0.755	-34.248
N:+2.75	B71	ENVOLV MAX	0.000	-8.310	0.000	1.485	23.814
N:+2.75	B71	ENVOLV MAX	1.838	14.790	0.000	1.485	53.851
N:+2.75	B71	ENVOLV MAX	3.675	48.120	0.000	1.485	12.044
N:+2.75	B71	ENVOLV MIN	0.000	-29.940	0.000	-1.809	13.251
N:+2.75	B71	ENVOLV MIN	1.838	0.350	0.000	-1.809	16.577
N:+2.75	B71	ENVOLV MIN	3.675	20.390	0.000	-1.809	-31.495
N:+2.75	B75	ENVOLV MAX	0.000	-30.260	0.000	1.664	1.952
N:+2.75	B75	ENVOLV MAX	1.838	-9.880	0.000	1.664	68.276
N:+2.75	B75	ENVOLV MAX	3.675	15.100	0.000	1.664	70.795
N:+2.75	B75	ENVOLV MIN	0.000	-63.780	0.000	-1.381	-35.106
N:+2.75	B75	ENVOLV MIN	1.838	-27.800	0.000	-1.381	32.262
N:+2.75	B75	ENVOLV MIN	3.675	1.530	0.000	-1.381	38.248
N:+2.75	B76	ENVOLV MAX	0.000	28.190	0.000	1.304	69.354
N:+2.75	B76	ENVOLV MAX	1.687	57.540	0.000	1.304	24.247
N:+2.75	B76	ENVOLV MAX	3.375	89.970	0.000	1.304	-35.165
N:+2.75	B76	ENVOLV MIN	0.000	6.570	0.000	-1.544	36.339
N:+2.75	B76	ENVOLV MIN	1.687	24.060	0.000	-1.544	-6.336
N:+2.75	B76	ENVOLV MIN	3.375	41.540	0.000	-1.544	-133.966
N:+2.75	B78	ENVOLV MAX	0.000	-26.350	0.000	1.462	5.416
N:+2.75	B78	ENVOLV MAX	1.838	-5.970	0.000	1.462	61.223
N:+2.75	B78	ENVOLV MAX	3.675	21.550	0.000	1.462	48.936
N:+2.75	B78	ENVOLV MIN	0.000	-56.980	0.000	-1.601	-35.744
N:+2.75	B78	ENVOLV MIN	1.838	-22.320	0.000	-1.601	24.118
N:+2.75	B78	ENVOLV MIN	3.675	4.460	0.000	-1.601	26.119
N:+2.75	B80	ENVOLV MAX	0.000	21.700	0.000	1.271	48.506
N:+2.75	B80	ENVOLV MAX	1.687	50.710	0.000	1.271	22.959
N:+2.75	B80	ENVOLV MAX	3.375	80.530	0.000	1.271	-23.268
N:+2.75	B80	ENVOLV MIN	0.000	-1.150	0.000	-1.325	24.686
N:+2.75	B80	ENVOLV MIN	1.687	16.330	0.000	-1.325	-12.983
N:+2.75	B80	ENVOLV MIN	3.375	33.820	0.000	-1.325	-129.796
N:+6.00	B85	ENVOLV MAX	0.000	-19.900	0.000	-0.489	0.422
N:+6.00	B85	ENVOLV MAX	4.050	14.160	0.000	-0.489	63.795
N:+6.00	B85	ENVOLV MAX	4.050	1.180	0.000	2.946	63.803
N:+6.00	B85	ENVOLV MAX	8.100	67.290	0.000	2.946	-0.799
N:+6.00	B85	ENVOLV MIN	0.000	-67.630	0.000	-3.017	-53.009
N:+6.00	B85	ENVOLV MIN	4.050	-1.390	0.000	-3.017	21.412
N:+6.00	B85	ENVOLV MIN	4.050	-14.450	0.000	0.495	21.781
N:+6.00	B85	ENVOLV MIN	8.100	19.730	0.000	0.495	-49.661
N:+6.00	B87	ENVOLV MAX	0.000	-28.700	0.000	-1.423	-15.531
N:+6.00	B87	ENVOLV MAX	4.050	-0.600	0.000	-1.423	112.899
N:+6.00	B87	ENVOLV MAX	4.050	14.310	0.000	5.873	112.783
N:+6.00	B87	ENVOLV MAX	8.100	73.480	0.000	5.873	-15.987
N:+6.00	B87	ENVOLV MIN	0.000	-74.350	0.000	-5.805	-70.230
N:+6.00	B87	ENVOLV MIN	4.050	-14.910	0.000	-5.805	38.240
N:+6.00	B87	ENVOLV MIN	4.050	0.100	0.000	1.429	38.351
N:+6.00	B87	ENVOLV MIN	8.100	28.200	0.000	1.429	-66.102
N:+6.00	B99	ENVOLV MAX	0.000	-16.010	0.000	1.616	4.144
N:+6.00	B99	ENVOLV MAX	0.963	-11.010	0.000	1.616	27.610
N:+6.00	B99	ENVOLV MAX	1.925	-6.000	0.000	1.616	47.800
N:+6.00	B99	ENVOLV MIN	0.000	-50.350	0.000	-1.643	-31.067
N:+6.00	B99	ENVOLV MIN	0.963	-36.270	0.000	-1.643	-6.681
N:+6.00	B99	ENVOLV MIN	1.925	-22.190	0.000	-1.643	1.620
N:+6.00	B100	ENVOLV MAX	0.000	8.210	0.000	0.414	41.890
N:+6.00	B100	ENVOLV MAX	0.862	17.530	0.000	0.414	32.325
N:+6.00	B100	ENVOLV MAX	1.724	28.940	0.000	0.414	11.673
N:+6.00	B100	ENVOLV MIN	0.000	-5.520	0.000	-0.364	0.583
N:+6.00	B100	ENVOLV MIN	0.862	-1.320	0.000	-0.364	3.869
N:+6.00	B100	ENVOLV MIN	1.724	2.890	0.000	-0.364	2.857
N:+9.25	B117	ENVOLV MAX	0.000	-13.420	0.000	0.107	3.773
N:+9.25	B117	ENVOLV MAX	3.148	11.010	0.000	0.107	41.843
N:+9.25	B117	ENVOLV MAX	3.148	2.170	0.000	1.560	41.881
N:+9.25	B117	ENVOLV MAX	6.300	49.950	0.000	1.560	1.603
N:+9.25	B117	ENVOLV MIN	0.000	-49.120	0.000	-1.994	-25.526
N:+9.25	B117	ENVOLV MIN	3.148	-1.190	0.000	-1.994	10.956
N:+9.25	B117	ENVOLV MIN	3.148	-10.770	0.000	-0.037	11.063
N:+9.25	B117	ENVOLV MIN	6.300	13.500	0.000	-0.037	-27.430
N:+9.25	B120	ENVOLV MAX	0.000	-21.840	0.000	-1.134	-7.250
N:+9.25	B120	ENVOLV MAX	3.148	-0.520	0.000	-1.134	76.100
N:+9.25	B120	ENVOLV MAX	3.148	14.260	0.000	4.392	75.823

N:+9.25	B120	ENVOLV MAX	6.300	57.900	0.000	4.392	-9.438
N:+9.25	B120	ENVOLV MIN	0.000	-58.310	0.000	-4.487	-40.434
N:+9.25	B120	ENVOLV MIN	3.148	-14.610	0.000	-4.487	25.111
N:+9.25	B120	ENVOLV MIN	3.148	0.920	0.000	1.003	25.099
N:+9.25	B120	ENVOLV MIN	6.300	22.270	0.000	1.003	-38.968
N:+9.25	B126	ENVOLV MAX	0.000	-2.690	0.000	0.380	8.869
N:+9.25	B126	ENVOLV MAX	0.862	1.510	0.000	0.380	29.637
N:+9.25	B126	ENVOLV MAX	1.724	5.720	0.000	0.380	40.406
N:+9.25	B126	ENVOLV MIN	0.000	-27.770	0.000	-0.127	2.147
N:+9.25	B126	ENVOLV MIN	0.862	-18.290	0.000	-0.127	2.993
N:+9.25	B126	ENVOLV MIN	1.724	-8.970	0.000	-0.127	-0.460
N:+9.25	B127	ENVOLV MAX	0.000	13.950	0.000	1.119	43.910
N:+9.25	B127	ENVOLV MAX	0.963	28.030	0.000	1.119	28.929
N:+9.25	B127	ENVOLV MAX	1.925	42.110	0.000	1.119	7.299
N:+9.25	B127	ENVOLV MIN	0.000	3.780	0.000	-0.915	-0.554
N:+9.25	B127	ENVOLV MIN	0.963	8.780	0.000	-0.915	-6.175
N:+9.25	B127	ENVOLV MIN	1.925	13.780	0.000	-0.915	-24.510
N:+6.00	B128	ENVOLV MAX	0.000	1.650	0.000	-1.110	4.250
N:+6.00	B128	ENVOLV MAX	1.576	20.280	0.000	-1.110	-0.253
N:+6.00	B128	ENVOLV MAX	3.152	42.020	0.000	-1.110	-14.283
N:+6.00	B128	ENVOLV MIN	0.000	-5.990	0.000	-3.190	-8.112
N:+6.00	B128	ENVOLV MIN	1.576	3.240	0.000	-3.190	-14.926
N:+6.00	B128	ENVOLV MIN	3.152	12.460	0.000	-3.190	-63.798
N:+2.75	B128	ENVOLV MAX	0.000	0.870	0.000	-0.929	-1.523
N:+2.75	B128	ENVOLV MAX	1.576	16.440	0.000	-0.929	1.101
N:+2.75	B128	ENVOLV MAX	3.152	35.860	0.000	-0.929	-6.790
N:+2.75	B128	ENVOLV MIN	0.000	-12.040	0.000	-2.662	-18.046
N:+2.75	B128	ENVOLV MIN	1.576	-0.190	0.000	-2.662	-21.216
N:+2.75	B128	ENVOLV MIN	3.152	9.030	0.000	-2.662	-64.014
N:+6.00	B129	ENVOLV MAX	0.000	-8.330	0.000	1.194	-2.053
N:+6.00	B129	ENVOLV MAX	1.574	0.880	0.000	1.194	10.503
N:+6.00	B129	ENVOLV MAX	3.148	15.190	0.000	1.194	5.252
N:+6.00	B129	ENVOLV MIN	0.000	-30.270	0.000	0.595	-31.273
N:+6.00	B129	ENVOLV MIN	1.574	-10.730	0.000	0.595	-3.337
N:+6.00	B129	ENVOLV MIN	3.148	2.350	0.000	0.595	-7.590
N:+2.75	B129	ENVOLV MAX	0.000	-9.470	0.000	2.764	-8.120
N:+2.75	B129	ENVOLV MAX	1.574	-0.270	0.000	2.764	0.587
N:+2.75	B129	ENVOLV MAX	3.148	10.860	0.000	2.764	-1.427
N:+2.75	B129	ENVOLV MIN	0.000	-37.510	0.000	0.967	-69.594
N:+2.75	B129	ENVOLV MIN	1.574	-18.150	0.000	0.967	-24.322
N:+2.75	B129	ENVOLV MIN	3.148	-1.900	0.000	0.967	-18.325
N:+6.00	B131	ENVOLV MAX	0.000	-0.900	0.000	-1.191	43.579
N:+6.00	B131	ENVOLV MAX	2.476	32.570	0.000	-1.191	20.444
N:+6.00	B131	ENVOLV MAX	4.952	71.900	0.000	-1.191	-35.166
N:+6.00	B131	ENVOLV MIN	0.000	-8.330	0.000	-3.010	11.826
N:+6.00	B131	ENVOLV MIN	2.476	10.040	0.000	-3.010	2.374
N:+6.00	B131	ENVOLV MIN	4.952	25.840	0.000	-3.010	-117.706
N:+2.75	B131	ENVOLV MAX	0.000	-0.080	0.000	-1.123	45.263
N:+2.75	B131	ENVOLV MAX	2.476	33.210	0.000	-1.123	23.463
N:+2.75	B131	ENVOLV MAX	4.952	72.550	0.000	-1.123	-30.831
N:+2.75	B131	ENVOLV MIN	0.000	-8.280	0.000	-3.110	11.825
N:+2.75	B131	ENVOLV MIN	2.476	9.840	0.000	-3.110	-0.624
N:+2.75	B131	ENVOLV MIN	4.952	25.650	0.000	-3.110	-119.199
N:+6.00	B132	ENVOLV MAX	0.000	-23.600	0.000	2.160	-24.293
N:+6.00	B132	ENVOLV MAX	2.474	-7.820	0.000	2.160	33.946
N:+6.00	B132	ENVOLV MAX	4.948	13.080	0.000	2.160	43.641
N:+6.00	B132	ENVOLV MIN	0.000	-65.900	0.000	0.896	-87.999
N:+6.00	B132	ENVOLV MIN	2.474	-26.600	0.000	0.896	8.983
N:+6.00	B132	ENVOLV MIN	4.948	3.340	0.000	0.896	12.143
N:+2.75	B132	ENVOLV MAX	0.000	-22.860	0.000	1.986	-18.981
N:+2.75	B132	ENVOLV MAX	2.474	-7.070	0.000	1.986	36.007
N:+2.75	B132	ENVOLV MAX	4.948	13.850	0.000	1.986	45.490
N:+2.75	B132	ENVOLV MIN	0.000	-65.810	0.000	0.819	-85.725
N:+2.75	B132	ENVOLV MIN	2.474	-26.520	0.000	0.819	7.952
N:+2.75	B132	ENVOLV MIN	4.948	2.720	0.000	0.819	12.698
N:+2.75	B133	ENVOLV MAX	0.000	-26.900	0.000	1.420	7.903
N:+2.75	B133	ENVOLV MAX	1.838	-6.530	0.000	1.420	65.664
N:+2.75	B133	ENVOLV MAX	3.675	19.750	0.000	1.420	58.278
N:+2.75	B133	ENVOLV MIN	0.000	-60.310	0.000	-1.070	-42.243
N:+2.75	B133	ENVOLV MIN	1.838	-26.360	0.000	-1.070	24.101
N:+2.75	B133	ENVOLV MIN	3.675	1.670	0.000	-1.070	31.500
N:+2.75	B134	ENVOLV MAX	0.000	-16.600	0.000	2.325	-9.998
N:+2.75	B134	ENVOLV MAX	1.993	-4.330	0.000	2.325	22.601
N:+2.75	B134	ENVOLV MAX	3.985	10.570	0.000	2.325	32.641
N:+2.75	B134	ENVOLV MIN	0.000	-52.440	0.000	0.868	-58.847

N:+2.75	B134	ENVOLV MIN	1.993	-22.560	0.000	0.868	4.010
N:+2.75	B134	ENVOLV MIN	3.985	-0.170	0.000	0.868	4.820
N:+2.75	B135	ENVOLV MAX	0.000	-0.200	0.000	-0.294	33.899
N:+2.75	B135	ENVOLV MAX	1.995	20.020	0.000	-0.294	38.882
N:+2.75	B135	ENVOLV MAX	3.990	47.950	0.000	-0.294	9.202
N:+2.75	B135	ENVOLV MIN	0.000	-15.690	0.000	-1.081	4.528
N:+2.75	B135	ENVOLV MIN	1.995	1.230	0.000	-1.081	-0.430
N:+2.75	B135	ENVOLV MIN	3.990	13.520	0.000	-1.081	-55.561
N:+6.00	B137	ENVOLV MAX	0.000	-3.130	0.000	-0.950	39.794
N:+6.00	B137	ENVOLV MAX	2.445	26.210	0.000	-0.950	30.431
N:+6.00	B137	ENVOLV MAX	4.89	64.94	0	-0.95	-24.484
N:+6.00	B137	ENVOLV MIN	0	-13.08	0	-2.805	9.83
N:+6.00	B137	ENVOLV MIN	2.445	7.52	0	-2.805	7.519
N:+6.00	B137	ENVOLV MIN	4.89	23.1	0	-2.805	-88.394
N:+2.75	B137	ENVOLV MAX	0	-2.26	0	-0.814	41.425
N:+2.75	B137	ENVOLV MAX	2.445	26.22	0	-0.814	32.714
N:+2.75	B137	ENVOLV MAX	4.89	64.94	0	-0.814	-17.816
N:+2.75	B137	ENVOLV MIN	0	-14.09	0	-2.732	9.895
N:+2.75	B137	ENVOLV MIN	2.445	6.46	0	-2.732	6.286
N:+2.75	B137	ENVOLV MIN	4.89	22.04	0	-2.732	-86.775
N:+6.00	B138	ENVOLV MAX	0	-25.35	0	3.125	-34.736
N:+6.00	B138	ENVOLV MAX	2.443	-9.79	0	3.125	18.479
N:+6.00	B138	ENVOLV MAX	4.885	8.34	0	3.125	39.933
N:+6.00	B138	ENVOLV MIN	0	-70.54	0	1.324	-115.695
N:+6.00	B138	ENVOLV MIN	2.443	-31.86	0	1.324	1.361
N:+6.00	B138	ENVOLV MIN	4.885	1.01	0	1.324	9.6
N:+2.75	B138	ENVOLV MAX	0	-25.2	0	3.114	-30.583
N:+2.75	B138	ENVOLV MAX	2.443	-9.64	0	3.114	21.343
N:+2.75	B138	ENVOLV MAX	4.885	8.24	0	3.114	41.425
N:+2.75	B138	ENVOLV MIN	0	-71.22	0	1.295	-117.532
N:+2.75	B138	ENVOLV MIN	2.443	-32.54	0	1.295	-1.792
N:+2.75	B138	ENVOLV MIN	4.885	0.14	0	1.295	9.489
N:+2.75	B139	ENVOLV MAX	0	-25.12	0	2.67	-28.607
N:+2.75	B139	ENVOLV MAX	2.474	-9.33	0	2.67	28.454
N:+2.75	B139	ENVOLV MAX	4.948	9.8	0	2.67	48.781
N:+2.75	B139	ENVOLV MIN	0	-70.23	0	1.131	-104.284
N:+2.75	B139	ENVOLV MIN	2.474	-30.93	0	1.131	5.337
N:+2.75	B139	ENVOLV MIN	4.948	1.07	0	1.131	14.408
N:+2.75	B140	ENVOLV MAX	0	-2.73	0	-0.847	49.076
N:+2.75	B140	ENVOLV MAX	2.476	27.91	0	-0.847	36.185
N:+2.75	B140	ENVOLV MAX	4.952	67.25	0	-0.847	-21.749
N:+2.75	B140	ENVOLV MIN	0	-12.2	0	-2.159	13.832
N:+2.75	B140	ENVOLV MIN	2.476	8.15	0	-2.159	8.027
N:+2.75	B140	ENVOLV MIN	4.952	23.95	0	-2.159	-89.149

FUERZAS EN COLUMNAS

COLUMN FORCES

UNID: kN-m

Story	Column	Load	Loc	P	V2	V3	T	M2	M3
N:+6.00	C17	ENVOLV MAX	0	-117	35.34	144.37	2.624	212.63	28.465
N:+6.00	C17	ENVOLV MAX	1.625	-108.58	35.34	144.37	2.624	17.886	13.03
N:+6.00	C17	ENVOLV MAX	3.25	-100.15	35.34	144.37	2.624	87.468	132.639
N:+6.00	C17	ENVOLV MIN	0	-298.97	-78.17	-46.55	-2.51	-64.717	-121.991
N:+6.00	C17	ENVOLV MIN	1.625	-287.73	-78.17	-46.55	-2.51	-28.941	-36.956
N:+6.00	C17	ENVOLV MIN	3.25	-276.5	-78.17	-46.55	-2.51	-257.492	-86.967
N:+2.75	C17	ENVOLV MAX	0	-324.06	75.69	93.02	2.446	272.771	183.196
N:+2.75	C17	ENVOLV MAX	1.775	-314.86	75.69	93.02	2.446	109.818	55.938
N:+2.75	C17	ENVOLV MAX	3.55	-305.66	75.69	93.02	2.446	85.286	175.143
N:+2.75	C17	ENVOLV MIN	0	-824.72	-113.63	-71.26	-2.314	-191.613	-228.357
N:+2.75	C17	ENVOLV MIN	1.775	-812.45	-113.63	-71.26	-2.314	-67.281	-33.768
N:+2.75	C17	ENVOLV MIN	3.55	-800.18	-113.63	-71.26	-2.314	-81.37	-85.641
N:+6.00	C18	ENVOLV MAX	0	-82.06	5.04	53.16	2.624	83.15	-6.011
N:+6.00	C18	ENVOLV MAX	1.625	-73.64	5.04	53.16	2.624	38.297	43.226
N:+6.00	C18	ENVOLV MAX	3.25	-65.21	5.04	53.16	2.624	231.72	193.073
N:+6.00	C18	ENVOLV MIN	0	-269.74	-93	-122.52	-2.51	-167.458	-110.773
N:+6.00	C18	ENVOLV MIN	1.625	-258.5	-93	-122.52	-2.51	-9.882	-17.062
N:+6.00	C18	ENVOLV MIN	3.25	-247.27	-93	-122.52	-2.51	-90.582	-23.962
N:+2.75	C18	ENVOLV MAX	0	-202.2	72.44	69.66	2.446	246.225	179.028
N:+2.75	C18	ENVOLV MAX	1.775	-192.99	72.44	69.66	2.446	124.812	52.086
N:+2.75	C18	ENVOLV MAX	3.55	-183.79	72.44	69.66	2.446	134.275	123.392
N:+2.75	C18	ENVOLV MIN	0	-592.1	-91.53	-90.79	-2.314	-213.72	-201.765

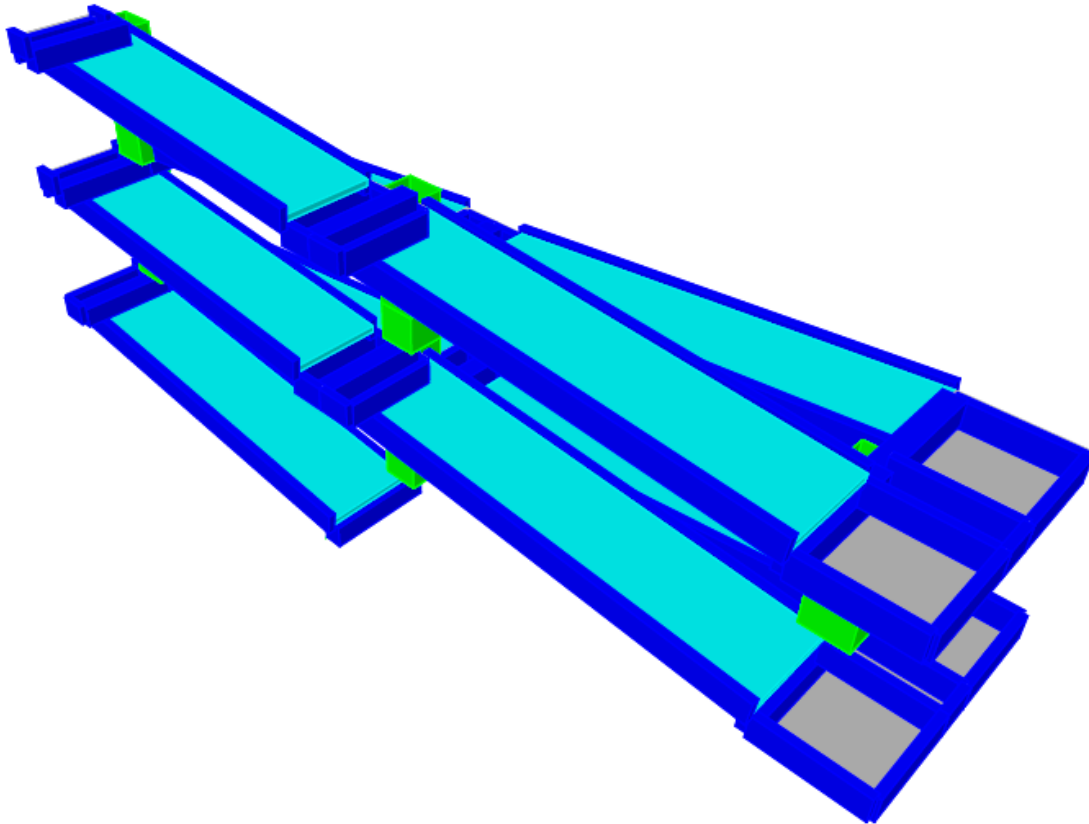
N:+2.75	C18	ENVOLV MIN	1.775	-579.83	-91.53	-90.79	-2.314	-54.818	-40.933
N:+2.75	C18	ENVOLV MIN	3.55	-567.56	-91.53	-90.79	-2.314	-26.792	-78.349
N:+6.00	C19	ENVOLV MAX	0	-133.83	69.44	115.02	2.624	173.44	86.762
N:+6.00	C19	ENVOLV MAX	1.625	-125.41	69.44	115.02	2.624	21.532	7.883
N:+6.00	C19	ENVOLV MAX	3.25	-116.99	69.44	115.02	2.624	87.486	145.516
N:+6.00	C19	ENVOLV MIN	0	-310.69	-88.76	-43.75	-2.51	-55.472	-147.11
N:+6.00	C19	ENVOLV MIN	1.625	-299.46	-88.76	-43.75	-2.51	-19.531	-36.837
N:+6.00	C19	ENVOLV MIN	3.25	-288.23	-88.76	-43.75	-2.51	-201.173	-143.076
N:+2.75	C19	ENVOLV MAX	0	-476.46	92.83	88.74	2.446	259.331	203.127
N:+2.75	C19	ENVOLV MAX	1.775	-467.26	92.83	88.74	2.446	110.284	44.308
N:+2.75	C19	ENVOLV MAX	3.55	-458.05	92.83	88.74	2.446	81.124	201.25
N:+2.75	C19	ENVOLV MIN	0	-1131.35	-124.6	-67.6	-2.314	-177.487	-241.123
N:+2.75	C19	ENVOLV MIN	1.775	-1119.08	-124.6	-67.6	-2.314	-65.959	-25.921
N:+2.75	C19	ENVOLV MIN	3.55	-1106.81	-124.6	-67.6	-2.314	-74.32	-126.479
N:+6.00	C20	ENVOLV MAX	0	-96.45	82.06	35.69	2.624	46.226	72.735
N:+6.00	C20	ENVOLV MAX	1.625	-88.03	82.06	35.69	2.624	20.162	-0.801
N:+6.00	C20	ENVOLV MAX	3.25	-79.6	82.06	35.69	2.624	225.65	82.19
N:+6.00	C20	ENVOLV MIN	0	-278.13	-51.47	-128.88	-2.51	-193.988	-85.397
N:+6.00	C20	ENVOLV MIN	1.625	-266.9	-51.47	-128.88	-2.51	-16.5	-61.574
N:+6.00	C20	ENVOLV MIN	3.25	-255.66	-51.47	-128.88	-2.51	-70.564	-194.278
N:+2.75	C20	ENVOLV MAX	0	-318.66	80.87	53.65	2.446	216.918	188.855
N:+2.75	C20	ENVOLV MAX	1.775	-309.46	80.87	53.65	2.446	134.241	51.329
N:+2.75	C20	ENVOLV MAX	3.55	-300.26	80.87	53.65	2.446	163.279	181.742
N:+2.75	C20	ENVOLV MIN	0	-732.05	-116.02	-101.35	-2.314	-213.189	-230.249
N:+2.75	C20	ENVOLV MIN	1.775	-719.78	-116.02	-101.35	-2.314	-45.832	-30.326
N:+2.75	C20	ENVOLV MIN	3.55	-707.51	-116.02	-101.35	-2.314	9.809	-98.344
N:+9.25	C21	ENVOLV MAX	0	-58.06	2	36.45	2.587	45.889	-3.484
N:+9.25	C21	ENVOLV MAX	1.625	-49.63	2	36.45	2.587	36.465	20.119
N:+9.25	C21	ENVOLV MAX	3.25	-41.21	2	36.45	2.587	162.055	125.36
N:+9.25	C21	ENVOLV MIN	0	-194.88	-65.38	-78.7	-2.43	-95.398	-87.874
N:+9.25	C21	ENVOLV MIN	1.625	-183.65	-65.38	-78.7	-2.43	-17.323	-8.476
N:+9.25	C21	ENVOLV MIN	3.25	-172.42	-65.38	-78.7	-2.43	-74.263	-10.715
N:+6.00	C21	ENVOLV MAX	0	-143.1	78.22	30.91	2.624	46.168	140.949
N:+6.00	C21	ENVOLV MAX	1.625	-134.67	78.22	30.91	2.624	5.249	42.303
N:+6.00	C21	ENVOLV MAX	3.25	-126.25	78.22	30.91	2.624	123.458	102.781
N:+6.00	C21	ENVOLV MIN	0	-431.22	-44.27	-83.07	-2.51	-148.137	-41.547
N:+6.00	C21	ENVOLV MIN	1.625	-419.99	-44.27	-83.07	-2.51	-22.462	1.922
N:+6.00	C21	ENVOLV MIN	3.25	-408.76	-44.27	-83.07	-2.51	-55.914	-113.733
N:+2.75	C21	ENVOLV MAX	0	-329.31	125.19	57.05	2.446	216.16	240.241
N:+2.75	C21	ENVOLV MAX	1.775	-320.11	125.19	57.05	2.446	128.988	24.665
N:+2.75	C21	ENVOLV MAX	3.55	-310.91	125.19	57.05	2.446	164.048	94.263
N:+2.75	C21	ENVOLV MIN	0	-844.4	-79.37	-100.73	-2.314	-206.154	-187.558
N:+2.75	C21	ENVOLV MIN	1.775	-832.13	-79.37	-100.73	-2.314	-41.462	-53.328
N:+2.75	C21	ENVOLV MIN	3.55	-819.86	-79.37	-100.73	-2.314	0.998	-204.273
N:+9.25	C22	ENVOLV MAX	0	-79.06	14.78	101.47	4.036	109.844	11.756
N:+9.25	C22	ENVOLV MAX	1.625	-67.83	14.78	101.47	4.036	20.438	10.415
N:+9.25	C22	ENVOLV MAX	3.25	-56.6	14.78	101.47	4.036	46.092	105.449
N:+9.25	C22	ENVOLV MIN	0	-212.02	-63.06	-22.72	-3.791	-41.373	-100.356
N:+9.25	C22	ENVOLV MIN	1.625	-197.05	-63.06	-22.72	-3.791	-79.944	-20.57
N:+9.25	C22	ENVOLV MIN	3.25	-182.07	-63.06	-22.72	-3.791	-233.575	-37.158
N:+6.00	C22	ENVOLV MAX	0	-270.78	107.84	102.23	4.093	201.623	199.092
N:+6.00	C22	ENVOLV MAX	1.625	-259.55	107.84	102.23	4.093	67.064	62.717
N:+6.00	C22	ENVOLV MAX	3.25	-248.31	107.84	102.23	4.093	109.894	146.23
N:+6.00	C22	ENVOLV MIN	0	-649.63	-63.49	-45.19	-3.915	-44.699	-63.639
N:+6.00	C22	ENVOLV MIN	1.625	-634.66	-63.49	-45.19	-3.915	-2.827	0.667
N:+6.00	C22	ENVOLV MIN	3.25	-619.68	-63.49	-45.19	-3.915	-138.344	-154.915
N:+2.75	C22	ENVOLV MAX	0	-572.33	172.98	168.54	3.816	564.52	327.654
N:+2.75	C22	ENVOLV MAX	1.775	-560.07	172.98	168.54	3.816	266.397	33.255
N:+2.75	C22	ENVOLV MAX	3.55	-547.8	172.98	168.54	3.816	95.364	133.754
N:+2.75	C22	ENVOLV MIN	0	-1370.79	-109.63	-121.26	-3.609	-371.486	-255.522
N:+2.75	C22	ENVOLV MIN	1.775	-1354.43	-109.63	-121.26	-3.609	-157.283	-73.565
N:+2.75	C22	ENVOLV MIN	3.55	-1338.07	-109.63	-121.26	-3.609	-70.17	-286.506
N:+9.25	C23	ENVOLV MAX	0	-122.9	25.91	82.69	4.036	95.188	15.611
N:+9.25	C23	ENVOLV MAX	1.625	-111.67	25.91	82.69	4.036	42.755	6.985
N:+9.25	C23	ENVOLV MAX	3.25	-100.44	25.91	82.69	4.036	75.862	98.418
N:+9.25	C23	ENVOLV MIN	0	-283.91	-63.88	-24.58	-3.791	-14.797	-109.929
N:+9.25	C23	ENVOLV MIN	1.625	-268.94	-63.88	-24.58	-3.791	-56.796	-39.598
N:+9.25	C23	ENVOLV MIN	3.25	-253.96	-63.88	-24.58	-3.791	-184.335	-69.324
N:+6.00	C23	ENVOLV MAX	0	-434.95	42.49	110.91	4.093	201.914	49.108
N:+6.00	C23	ENVOLV MAX	1.625	-423.72	42.49	110.91	4.093	54.332	16.521
N:+6.00	C23	ENVOLV MAX	3.25	-412.49	42.49	110.91	4.093	91.842	261.119
N:+6.00	C23	ENVOLV MIN	0	-1032.77	-152.64	-36.93	-3.915	-38.104	-235.417
N:+6.00	C23	ENVOLV MIN	1.625	-1017.79	-152.64	-36.93	-3.915	-10.739	-23.84
N:+6.00	C23	ENVOLV MIN	3.25	-1002.81	-152.64	-36.93	-3.915	-168.467	-89.448
N:+2.75	C23	ENVOLV MAX	0	-725.08	113.55	164.57	3.816	557.145	258.957

N:+2.75	C23	ENVOLV MAX	1.775	-712.81	113.55	164.57	3.816	265.821	67.395
N:+2.75	C23	ENVOLV MAX	3.55	-700.54	113.55	164.57	3.816	98.588	273.174
N:+2.75	C23	ENVOLV MIN	0	-1750.16	-168.16	-121.8	-3.609	-366.492	-323.855
N:+2.75	C23	ENVOLV MIN	1.775	-1733.8	-168.16	-121.8	-3.609	-151.086	-35.363
N:+2.75	C23	ENVOLV MIN	3.55	-1717.44	-168.16	-121.8	-3.609	-59.771	-144.213
N:+9.25	C24	ENVOLV MAX	0	-88.16	35.9	19.04	4.036	2.62	12.708
N:+9.25	C24	ENVOLV MAX	1.625	-76.93	35.9	19.04	4.036	39.722	4.049
N:+9.25	C24	ENVOLV MAX	3.25	-65.7	35.9	19.04	4.036	195.547	58.182
N:+9.25	C24	ENVOLV MIN	0	-246.39	-34.08	-99.81	-3.791	-140.37	-59.536
N:+9.25	C24	ENVOLV MIN	1.625	-231.41	-34.08	-99.81	-3.791	-46.213	-53.841
N:+9.25	C24	ENVOLV MIN	3.25	-216.43	-34.08	-99.81	-3.791	-70.778	-110.938
N:+6.00	C24	ENVOLV MAX	0	-286.6	25.47	37.59	4.093	67.74	20.007
N:+6.00	C24	ENVOLV MAX	1.625	-275.37	25.47	37.59	4.093	45.649	23.107
N:+6.00	C24	ENVOLV MAX	3.25	-264.14	25.47	37.59	4.093	206.898	209.397
N:+6.00	C24	ENVOLV MIN	0	-670.73	-115.77	-108.09	-3.915	-149.825	-167.907
N:+6.00	C24	ENVOLV MIN	1.625	-655.75	-115.77	-108.09	-3.915	-13.167	-24.269
N:+6.00	C24	ENVOLV MIN	3.25	-640.77	-115.77	-108.09	-3.915	-59.849	-63.822
N:+2.75	C24	ENVOLV MAX	0	-474.54	104.21	125.35	3.816	512.225	247.619
N:+2.75	C24	ENVOLV MAX	1.775	-462.27	104.21	125.35	3.816	293.597	68.317
N:+2.75	C24	ENVOLV MAX	3.55	-450	104.21	125.35	3.816	194.736	219.588
N:+2.75	C24	ENVOLV MIN	0	-1085.91	-145.19	-152.12	-3.609	-397.841	-295.96
N:+2.75	C24	ENVOLV MIN	1.775	-1069.55	-145.19	-152.12	-3.609	-131.7	-43.93
N:+2.75	C24	ENVOLV MIN	3.55	-1053.19	-145.19	-152.12	-3.609	14.674	-122.473
N:+9.25	C25	ENVOLV MAX	0	-120.67	32.41	37.05	4.767	71.916	38.064
N:+9.25	C25	ENVOLV MAX	1.625	-108.03	32.41	37.05	4.767	83.513	20.159
N:+9.25	C25	ENVOLV MAX	3.25	-95.39	32.41	37.05	4.767	123.725	68.242
N:+9.25	C25	ENVOLV MIN	0	-264.55	-31.11	-30.08	-4.478	-29.843	-34.654
N:+9.25	C25	ENVOLV MIN	1.625	-247.7	-31.11	-30.08	-4.478	-52.781	-18.86
N:+9.25	C25	ENVOLV MIN	3.25	-230.86	-31.11	-30.08	-4.478	-104.333	-69.054
N:+6.00	C25	ENVOLV MAX	0	-501.82	71.99	130.37	4.835	222.703	93.431
N:+6.00	C25	ENVOLV MAX	1.625	-489.18	71.99	130.37	4.835	82.541	27.666
N:+6.00	C25	ENVOLV MAX	3.25	-476.55	71.99	130.37	4.835	133.104	136.695
N:+6.00	C25	ENVOLV MIN	0	-1149.98	-68.37	-44.61	-4.625	-32.232	-86.56
N:+6.00	C25	ENVOLV MIN	1.625	-1133.13	-68.37	-44.61	-4.625	-31.437	-26.676
N:+6.00	C25	ENVOLV MIN	3.25	-1116.28	-68.37	-44.61	-4.625	-221.366	-141.585
N:+2.75	C25	ENVOLV MAX	0	-878.65	135.72	241.67	4.507	843.326	300.579
N:+2.75	C25	ENVOLV MAX	1.775	-864.84	135.72	241.67	4.507	415.76	59.895
N:+2.75	C25	ENVOLV MAX	3.55	-851.04	135.72	241.67	4.507	160.719	181.805
N:+2.75	C25	ENVOLV MIN	0	-2046.58	-136.46	-191.99	-4.263	-579.582	-303.081
N:+2.75	C25	ENVOLV MIN	1.775	-2028.18	-136.46	-191.99	-4.263	-240.192	-61.082
N:+2.75	C25	ENVOLV MIN	3.55	-2009.77	-136.46	-191.99	-4.263	-73.327	-181.678
N:+9.25	C26	ENVOLV MAX	0	-43.59	22.78	19.28	4.767	-0.603	23.202
N:+9.25	C26	ENVOLV MAX	1.625	-30.95	22.78	19.28	4.767	37.14	22.805
N:+9.25	C26	ENVOLV MAX	3.25	-18.31	22.78	19.28	4.767	102.47	57.91
N:+9.25	C26	ENVOLV MIN	0	-138.94	-22.89	-57.22	-4.478	-130.121	-21.354
N:+9.25	C26	ENVOLV MIN	1.625	-122.09	-22.89	-57.22	-4.478	-106.215	-20.783
N:+9.25	C26	ENVOLV MIN	3.25	-105.24	-22.89	-57.22	-4.478	-109.897	-55.713
N:+6.00	C26	ENVOLV MAX	0	-293.15	51.84	39.67	4.835	65.413	57.89
N:+6.00	C26	ENVOLV MAX	1.625	-280.51	51.84	39.67	4.835	85.759	31.715
N:+6.00	C26	ENVOLV MAX	3.25	-267.88	51.84	39.67	4.835	299.113	109.967
N:+6.00	C26	ENVOLV MIN	0	-634.03	-49.63	-139.31	-4.625	-169.332	-53.751
N:+6.00	C26	ENVOLV MIN	1.625	-617.18	-49.63	-139.31	-4.625	-27.754	-31.164
N:+6.00	C26	ENVOLV MIN	3.25	-600.33	-49.63	-139.31	-4.625	-79.185	-113.005
N:+2.75	C26	ENVOLV MAX	0	-543.35	123.78	197.88	4.507	795.879	286.152
N:+2.75	C26	ENVOLV MAX	1.775	-529.55	123.78	197.88	4.507	446.743	66.75
N:+2.75	C26	ENVOLV MAX	3.55	-515.75	123.78	197.88	4.507	263.354	154.87
N:+2.75	C26	ENVOLV MIN	0	-1143.2	-124.7	-223.74	-4.263	-613.248	-288.05
N:+2.75	C26	ENVOLV MIN	1.775	-1124.8	-124.7	-223.74	-4.263	-218.21	-67.024
N:+2.75	C26	ENVOLV MIN	3.55	-1106.39	-124.7	-223.74	-4.263	11.082	-153.519
N:+9.25	C27	ENVOLV MAX	0	-94.52	71.93	43.95	4.036	57.839	119.338
N:+9.25	C27	ENVOLV MAX	1.625	-83.29	71.93	43.95	4.036	66.224	34.418
N:+9.25	C27	ENVOLV MAX	3.25	-72.06	71.93	43.95	4.036	118.827	59.229
N:+9.25	C27	ENVOLV MIN	0	-235.65	-21	-37.19	-3.791	-45.555	-9.744
N:+9.25	C27	ENVOLV MIN	1.625	-220.67	-21	-37.19	-3.791	-64.934	-7.586
N:+9.25	C27	ENVOLV MIN	3.25	-205.7	-21	-37.19	-3.791	-128.531	-115.159
N:+6.00	C27	ENVOLV MAX	0	-416.96	151.09	92.86	4.093	135.192	232.518
N:+6.00	C27	ENVOLV MAX	1.625	-405.73	151.09	92.86	4.093	69.829	25.457
N:+6.00	C27	ENVOLV MAX	3.25	-394.49	151.09	92.86	4.093	171.835	86.768
N:+6.00	C27	ENVOLV MIN	0	-1024.13	-40.21	-70.25	-3.915	-67.345	-44.412
N:+6.00	C27	ENVOLV MIN	1.625	-1009.15	-40.21	-70.25	-3.915	-38.738	-17.53
N:+6.00	C27	ENVOLV MIN	3.25	-994.18	-40.21	-70.25	-3.915	-177.5	-259.022
N:+2.75	C27	ENVOLV MAX	0	-701.61	163.23	208.23	3.816	703.206	316.236
N:+2.75	C27	ENVOLV MAX	1.775	-689.34	163.23	208.23	3.816	335.001	35.678
N:+2.75	C27	ENVOLV MAX	3.55	-677.07	163.23	208.23	3.816	194.946	142.557
N:+2.75	C27	ENVOLV MIN	0	-1778.03	-113.2	-189.24	-3.609	-530.622	-259.58

N:+2.75	C27	ENVOLV MIN	1.775	-1761.67	-113.2	-189.24	-3.609	-196.136	-67.819
N:+2.75	C27	ENVOLV MIN	3.55	-1745.31	-113.2	-189.24	-3.609	-89.799	-263.494
N:+9.25	C28	ENVOLV MAX	0	-28.44	64.84	32.46	4.036	12.336	110.488
N:+9.25	C28	ENVOLV MAX	1.625	-17.21	64.84	32.46	4.036	38.924	41.183
N:+9.25	C28	ENVOLV MAX	3.25	-5.98	64.84	32.46	4.036	108.512	49.407
N:+9.25	C28	ENVOLV MIN	0	-128.54	-11.1	-52.73	-3.791	-92.541	11.978
N:+9.25	C28	ENVOLV MIN	1.625	-113.57	-11.1	-52.73	-3.791	-86.19	-6.044
N:+9.25	C28	ENVOLV MIN	3.25	-98.59	-11.1	-52.73	-3.791	-122.839	-101.596
N:+6.00	C28	ENVOLV MAX	0	-174.63	139.22	50.08	4.093	81.619	209.097
N:+6.00	C28	ENVOLV MAX	1.625	-163.4	139.22	50.08	4.093	80.083	27.213
N:+6.00	C28	ENVOLV MAX	3.25	-152.17	139.22	50.08	4.093	233.177	48.521
N:+6.00	C28	ENVOLV MIN	0	-472.12	-15.13	-101.8	-3.915	-116.106	-1.696
N:+6.00	C28	ENVOLV MIN	1.625	-457.15	-15.13	-101.8	-3.915	-30.528	-21.459
N:+6.00	C28	ENVOLV MIN	3.25	-442.17	-15.13	-101.8	-3.915	-99.58	-244.414
N:+2.75	C28	ENVOLV MAX	0	-291.66	154.54	198.87	3.816	692.925	305.915
N:+2.75	C28	ENVOLV MAX	1.775	-279.39	154.54	198.87	3.816	341.358	39.597
N:+2.75	C28	ENVOLV MAX	3.55	-267.12	154.54	198.87	3.816	211.089	111.632
N:+2.75	C28	ENVOLV MIN	0	-794.01	-99.9	-199.33	-3.609	-541.682	-243.178
N:+2.75	C28	ENVOLV MIN	1.775	-777.65	-99.9	-199.33	-3.609	-189.297	-73.853
N:+2.75	C28	ENVOLV MIN	3.55	-761.3	-99.9	-199.33	-3.609	-58.208	-242.88
N:+9.25	C29	ENVOLV MAX	0	-45.89	52	56.73	2.587	46.97	91.068
N:+9.25	C29	ENVOLV MAX	1.625	-37.46	52	56.73	2.587	25.2	18.576
N:+9.25	C29	ENVOLV MAX	3.25	-29.04	52	56.73	2.587	82.359	44.672
N:+9.25	C29	ENVOLV MIN	0	-152.18	-21.46	-37.36	-2.43	-45.978	-25.361
N:+9.25	C29	ENVOLV MIN	1.625	-140.95	-21.46	-37.36	-2.43	-55.686	-2.494
N:+9.25	C29	ENVOLV MIN	3.25	-129.71	-21.46	-37.36	-2.43	-144.324	-78.216
N:+6.00	C29	ENVOLV MAX	0	-220.9	82.82	78.31	2.624	140.722	116.754
N:+6.00	C29	ENVOLV MAX	1.625	-212.47	82.82	78.31	2.624	29.637	-8.278
N:+6.00	C29	ENVOLV MAX	3.25	-204.05	82.82	78.31	2.624	144.694	149.224
N:+6.00	C29	ENVOLV MIN	0	-583.9	-98.14	-78.78	-2.51	-113.054	-182.991
N:+6.00	C29	ENVOLV MIN	1.625	-572.67	-98.14	-78.78	-2.51	-1.203	-33.073
N:+6.00	C29	ENVOLV MIN	3.25	-561.44	-98.14	-78.78	-2.51	-115.494	-165.688
N:+2.75	C29	ENVOLV MAX	0	-480.86	54.7	60.3	2.031	185.605	102.931
N:+2.75	C29	ENVOLV MAX	1.775	-471.66	54.7	60.3	2.031	88.581	23.603
N:+2.75	C29	ENVOLV MAX	3.55	-462.46	54.7	60.3	2.031	90.766	168.55
N:+2.75	C29	ENVOLV MIN	0	-1256.95	-81.89	-61.34	-1.921	-141.496	-122.217
N:+2.75	C29	ENVOLV MIN	1.775	-1244.68	-81.89	-61.34	-1.921	-42.627	5.386
N:+2.75	C29	ENVOLV MIN	3.55	-1232.41	-81.89	-61.34	-1.921	-42.967	-91.286
N:+0.8	C29	ENVOLV MAX	0	-484.62	54.86	60.4	2.031	225.677	142.717
N:+0.8	C29	ENVOLV MAX	0.363	-482.74	54.86	60.4	2.031	205.633	122.82
N:+0.8	C29	ENVOLV MAX	0.726	-480.86	54.86	60.4	2.031	185.605	102.931
N:+0.8	C29	ENVOLV MIN	0	-1261.97	-82.05	-61.44	-1.921	-182.322	-181.747
N:+0.8	C29	ENVOLV MIN	0.363	-1259.46	-82.05	-61.44	-1.921	-161.901	-151.978
N:+0.8	C29	ENVOLV MIN	0.726	-1256.95	-82.05	-61.44	-1.921	-141.496	-122.217
N:+6.00	C30	ENVOLV MAX	0	-78.42	77.1	143.69	2.624	241.092	147.087
N:+6.00	C30	ENVOLV MAX	1.625	-70	77.1	143.69	2.624	32.359	49.263
N:+6.00	C30	ENVOLV MAX	3.25	-61.57	77.1	143.69	2.624	167.809	103.037
N:+6.00	C30	ENVOLV MIN	0	-256.83	-43.65	-86.03	-2.51	-112.335	-39.035
N:+6.00	C30	ENVOLV MIN	1.625	-245.6	-43.65	-86.03	-2.51	2.709	4.444
N:+6.00	C30	ENVOLV MIN	3.25	-234.37	-43.65	-86.03	-2.51	-226.43	-103.676
N:+2.75	C30	ENVOLV MAX	0	-283.34	73.12	80.89	2.031	218.325	115.281
N:+2.75	C30	ENVOLV MAX	1.775	-274.14	73.12	80.89	2.031	76.678	-1.24
N:+2.75	C30	ENVOLV MAX	3.55	-264.94	73.12	80.89	2.031	71.702	38.781
N:+2.75	C30	ENVOLV MIN	0	-808.05	-36.53	-60.54	-1.921	-159.172	-91.109
N:+2.75	C30	ENVOLV MIN	1.775	-795.78	-36.53	-60.54	-1.921	-53.662	-39.523
N:+2.75	C30	ENVOLV MIN	3.55	-783.51	-36.53	-60.54	-1.921	-84.824	-144.478
N:+0.8	C30	ENVOLV MAX	0	-287.11	73.23	81.01	2.031	276.931	168.413
N:+0.8	C30	ENVOLV MAX	0.363	-285.23	73.23	81.01	2.031	247.615	141.844
N:+0.8	C30	ENVOLV MAX	0.726	-283.34	73.23	81.01	2.031	218.325	115.281
N:+0.8	C30	ENVOLV MIN	0	-813.07	-36.65	-60.65	-1.921	-202.998	-117.682
N:+0.8	C30	ENVOLV MIN	0.363	-810.56	-36.65	-60.65	-1.921	-181.072	-104.393
N:+0.8	C30	ENVOLV MIN	0.726	-808.05	-36.65	-60.65	-1.921	-159.172	-91.109
N:+6.00	C31	ENVOLV MAX	0	-4.31	56.09	98.62	2.624	132.685	105.327
N:+6.00	C31	ENVOLV MAX	1.625	4.12	56.09	98.62	2.624	1.363	38.266
N:+6.00	C31	ENVOLV MAX	3.25	12.54	56.09	98.62	2.624	170.138	70.285
N:+6.00	C31	ENVOLV MIN	0	-137.65	-26.36	-106.48	-2.51	-176.696	-15.836
N:+6.00	C31	ENVOLV MIN	1.625	-126.42	-26.36	-106.48	-2.51	-32.614	2.901
N:+6.00	C31	ENVOLV MIN	3.25	-115.19	-26.36	-106.48	-2.51	-188.628	-77.442
N:+2.75	C31	ENVOLV MAX	0	-118.61	62.61	55.55	2.031	197.614	107.956
N:+2.75	C31	ENVOLV MAX	1.775	-109.41	62.61	55.55	2.031	111.787	4.983
N:+2.75	C31	ENVOLV MAX	3.55	-100.2	62.61	55.55	2.031	155.321	30.452
N:+2.75	C31	ENVOLV MIN	0	-477.33	-33.4	-88.32	-1.921	-173.47	-88.434
N:+2.75	C31	ENVOLV MIN	1.775	-465.07	-33.4	-88.32	-1.921	-29.473	-37.317
N:+2.75	C31	ENVOLV MIN	3.55	-452.8	-33.4	-88.32	-1.921	-14.839	-114.642
N:+0.8	C31	ENVOLV MAX	0	-122.37	62.75	55.67	2.031	233.406	153.452

N:+0.8	C31	ENVOLV MAX	0.363	-120.49	62.75	55.67	2.031	215.496	130.7
N:+0.8	C31	ENVOLV MAX	0.726	-118.61	62.75	55.67	2.031	197.614	107.956
N:+0.8	C31	ENVOLV MIN	0	-482.35	-33.54	-88.44	-1.921	-233.054	-112.719
N:+0.8	C31	ENVOLV MIN	0.363	-479.84	-33.54	-88.44	-1.921	-203.249	-100.572
N:+0.8	C31	ENVOLV MIN	0.726	-477.33	-33.54	-88.44	-1.921	-173.47	-88.434
N:+9.25	C32	ENVOLV MAX	0	-6.87	30.95	52.13	2.587	53.987	42.954
N:+9.25	C32	ENVOLV MAX	1.625	1.55	30.95	52.13	2.587	31.659	9.176
N:+9.25	C32	ENVOLV MAX	3.25	9.98	30.95	52.13	2.587	94.592	39.335
N:+9.25	C32	ENVOLV MIN	0	-85.85	-19.54	-40.89	-2.43	-43.42	-24.857
N:+9.25	C32	ENVOLV MIN	1.625	-74.62	-19.54	-40.89	-2.43	-39.367	-9.617
N:+9.25	C32	ENVOLV MIN	3.25	-63.39	-19.54	-40.89	-2.43	-120.575	-58.314
N:+6.00	C32	ENVOLV MAX	0	-27.14	56.97	66.05	2.624	106.349	74.501
N:+6.00	C32	ENVOLV MAX	1.625	-18.72	56.97	66.05	2.624	13.52	-4.534
N:+6.00	C32	ENVOLV MAX	3.25	-10.29	56.97	66.05	2.624	142.611	155.437
N:+6.00	C32	ENVOLV MIN	0	-218.6	-103.97	-87.31	-2.51	-142.777	-182.603
N:+6.00	C32	ENVOLV MIN	1.625	-207.37	-103.97	-87.31	-2.51	-15.398	-27.198
N:+6.00	C32	ENVOLV MIN	3.25	-196.14	-103.97	-87.31	-2.51	-109.94	-110.8
N:+2.75	C32	ENVOLV MAX	0	-125.14	46.73	48.47	2.031	178.827	97.259
N:+2.75	C32	ENVOLV MAX	1.775	-115.94	46.73	48.47	2.031	100.052	23.865
N:+2.75	C32	ENVOLV MAX	3.55	-106.74	46.73	48.47	2.031	118.845	157.999
N:+2.75	C32	ENVOLV MIN	0	-491.42	-77.99	-71.04	-1.921	-148.91	-118.946
N:+2.75	C32	ENVOLV MIN	1.775	-479.15	-77.99	-71.04	-1.921	-30.061	9.944
N:+2.75	C32	ENVOLV MIN	3.55	-466.88	-77.99	-71.04	-1.921	-8.78	-68.694
N:+0.8	C32	ENVOLV MAX	0	-128.91	46.91	48.57	2.031	211.432	131.258
N:+0.8	C32	ENVOLV MAX	0.363	-127.02	46.91	48.57	2.031	195.122	114.254
N:+0.8	C32	ENVOLV MAX	0.726	-125.14	46.91	48.57	2.031	178.827	97.259
N:+0.8	C32	ENVOLV MIN	0	-496.44	-78.17	-71.14	-1.921	-197.905	-175.644
N:+0.8	C32	ENVOLV MIN	0.363	-493.93	-78.17	-71.14	-1.921	-173.4	-147.29
N:+0.8	C32	ENVOLV MIN	0.726	-491.42	-78.17	-71.14	-1.921	-148.91	-118.946

**PROYECTO: I.E. EL SUR - RAMPA
IPIALES (NARIÑO)**
dye16-2257



**MEMORIAS DE ANÁLISIS
Y DISEÑO ESTRUCTURAL**

BOGOTÁ D.C. 18 DE NOVIEMBRE DE 2016

1. DESCRIPCIÓN DEL PROYECTO

1.1. INTRODUCCIÓN

El presente documento contiene las memorias de análisis y diseño estructural correspondiente al proyecto **I.E. EL SUR – RAMPA** ubicado en **IPIALES (NARIÑO)**

1.2. DESCRIPCIÓN ARQUITECTÓNICA

El proyecto se encuentra ubicado en un lote de 1700m² de área aproximadamente, en la cual se contempla la construcción de un centro educacional.

1.3. DESCRIPCIÓN SISTEMA ESTRUCTURAL

El proyecto se soluciona mediante la construcción de pórticos en concreto reforzado. Las placas de la rampa y en los descansos estarán constituidas por placas macizas de 10 cm de espesor y vigas descolgadas de 50 cm de altura.

Para su análisis se empleó el programa de computador **ETABS v9.7.4.**, el cual tiene en cuenta los efectos de segundo orden. Las consideraciones sísmicas empleadas en el análisis estructural del proyecto son las siguientes:

- | | |
|---|--------------------------------|
| ✓ Método de análisis: | Análisis Modal |
| ✓ Zona de amenaza sísmica: | Alta |
| ✓ Zona de microzonificación sísmica: | No Aplica |
| ✓ Capacidad de disipación de energía: | Especial |
| ✓ Coeficiente de disipación de energía: | $R_o = 1.50$ |

El valor final del coeficiente R es igual a **1.50**

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 la estructura satisface los requerimientos de sollicitación ocasionados por las derivas presentes. La carga viva de diseño es de 5.00kN/m².

Para la cimentación se siguieron las recomendaciones descritas en el respectivo estudio de suelos, que recomienda apoyar la estructura a **-1.00 m** del nivel de

terreno, según lo indicado en los planos estructurales. La capacidad portante de seguridad admisible del suelo es **0.145 MPa** y el tipo de suelo es **E**.

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.

1.4. MATERIALES

Los materiales utilizados son:

Concreto	21.1 MPa para vigas, placas y cimentación.
Concreto	28 MPa para columnas
Concreto	14.0 MPa (para concreto de limpieza)
Acero	$f_y = 420$ MPa para todos los diámetros.

Atentamente:

EDGAR ROLANDO BARRERA
ING. ESTRUCTURAL
T.P. 15202-102710 BYC

JAIR USECHE MACÍAS
ING. ESTRUCTURAL
T.P. 25202-56174 CND

MEMORIAL DE RESPONSABILIDAD

IPIALES, 18 de Noviembre de 2016

Señores

PLANEACIÓN MUNICIPAL

La Ciudad

Yo, **EDGAR ROLANDO BARRERA**, ingeniero civil con Matrícula Profesional N° **15202-102710** de **BOYACÁ**, y Yo, **JAIR USECHE MACÍAS**, ingeniero civil con Matrícula Profesional N° **25202-56174** de **CUNDINAMARCA** debidamente registrados en el consejo profesional de Ingeniería y Arquitectura de Boyacá y Cundinamarca, presentamos 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. EL SUR – RAMPA ubicado en el municipio de IPIALES (NARIÑO), declaramos que asumimos la responsabilidad por los perjuicios que causa de ellos puedan deducirse, exonerando a PLANEACION MUNICIPAL de cualquier responsabilidad.

Aceptamos y reconocemos que la revisión efectuada por PLANEACION MUNICIPAL 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

JAIR USECHE MACÍAS
ING. ESTRUCTURAL
T.P. 25202-56174 CND

REPUBLICA DE COLOMBIA
Consejo Profesional Nacional de Ingeniería
y Arquitectura



MATRÍCULA No. 2528256174CND
INGENIERO CIVIL
DE FECHA 27/07/95
APELLIDOS
USECHE MACIAS
NOMBRES
JAIR
C.C. 19,428,425
UNIV. NACIONAL - BOGOTÁ

Otmar Villagómez
Presidente del Consejo

2. AVALÚO DE CARGAS

AVALÚO DE CARGAS

PROYECTO: I.E. EL SUR (IPIALES) - RAMPA

AVALÚO DE CARGAS

1. PLACA MACIZA RAMPA

Placa Maciza e=0.10m	0.10x24		2.40 kN/m ²
Impermeabilización	20x0.05		1.00 kN/m ²
		CM	3.40 kN/m ²
		CV	5.00 kN/m ²
		CR	8.40 kN/m ²

$CU = 1.2 \times 3.4 + 1.6 \times 5 = 12.1 \text{ kN/m}^2$

Espesor de placa equivalente:

$e = CM/24 = 0.142 \text{ m}$

Muros perimetrales	0.90X0.15X13	1.76 kN/m
--------------------	--------------	-----------

3. ANÁLISIS SÍSMICO

ANÁLISIS SÍSMICO
COMPROBACIÓN DE DERIVAS

PROYECTO: I.E. EL SUR (IPIALES) - RAMPA ANÁLISIS SÍSMICO (ESPECTRO DE DISEÑO NSR-10)

ZONA DE AMENAZA SÍSMICA

ALTA

EFFECTOS LOCALES

Perfil de Suelo	E
Coefficiente Aa	0.30
Coefficiente Av	0.25

COEFICIENTE DE IMPORTANCIA

Grupo de Uso	III
Coefficiente de importancia	1.25

PERIODO FUNDAMENTAL DE LA EDIFICACIÓN

$T_a = C_t h^\alpha$		
$C_t =$	0.047	
$h =$	7.53	m
$\alpha =$	0.90	
$T_a =$	0.29	Seg

VARIACIÓN COEFICIENTE DE CAPACIDAD DE DISIPACIÓN DE ENERGÍA

R_o : 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

R_o	1.50
ϕ_a	1.00
ϕ_p	1.00
ϕ_r	1.00
ϕ	1.00
R	1.50

TIPO	DESCRIPCIÓN	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 $\xi=5\%$ DEL CRÍTICO)

F_a : Factor de ampliación de la aceleración.

F_v : Factor de ampliación de la aceleración en el rango de velocidades constantes.

S_a : Valor del espectro de aceleraciones de diseño para un periodo de vibración dado.

A_a : Coeficiente que representa la aceleración horizontal pico efectiva para diseño.

A_v : 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 ALTA

T_o :	0.21	Seg
T_c :	1.00	Seg
T_L :	7.20	Seg
Aa:	0.30	
Av:	0.25	
Fa:	1.20	
Fv:	3.00	

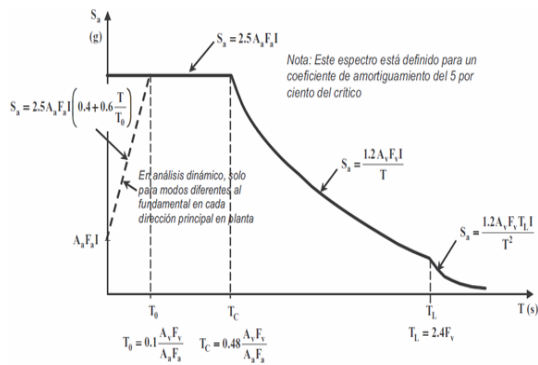
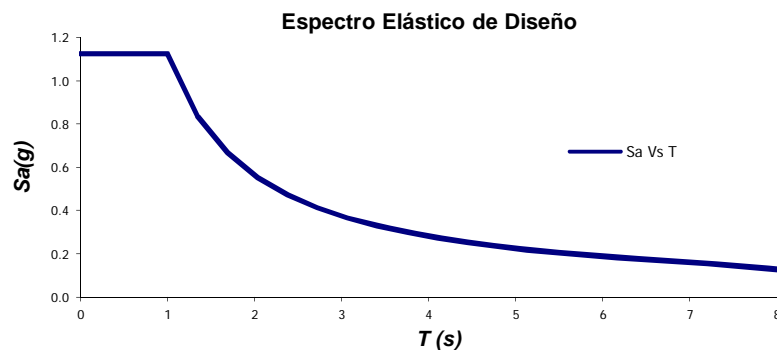
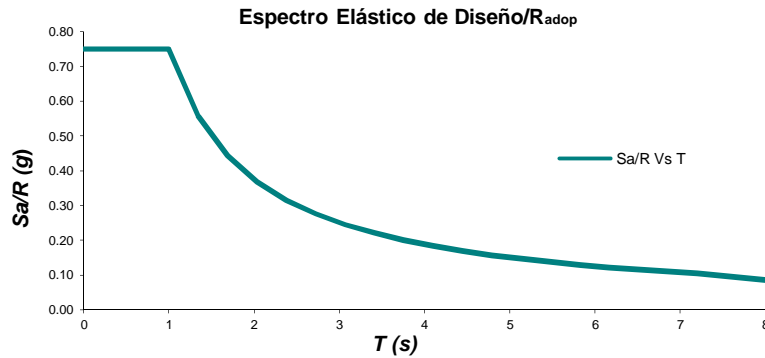


Figura A.2.6-1 — Espectro Elástico de Aceleraciones de Diseño como fracción de g

T	Sa	Sa/R _{adoptado}
(Seg)	(%g)	(%g)
0.00	1.125	0.750
0.05	1.125	0.750
0.10	1.125	0.750
0.16	1.125	0.750
0.21	1.125	0.750
0.41	1.125	0.750
0.60	1.125	0.750
0.80	1.125	0.750
1.00	1.125	0.750
1.34	0.837	0.558
1.69	0.666	0.444
2.03	0.553	0.369
2.38	0.473	0.315
2.72	0.413	0.276
3.07	0.367	0.245
3.41	0.330	0.220
3.76	0.300	0.200
4.10	0.274	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 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 rígidos 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: I.E. EL SUR (IPIALES) - RAMPA ANÁLISIS SÍSMICO (ESPECTRO DE UMBRAL DE DAÑO NSR-10)

ZONA DE AMENAZA SÍSMICA
ALTA

EFFECTOS LOCALES

Perfil de Suelo	E
Coefficiente Ad	0.08
Coefficiente Fv	3.50

COEFICIENTE DE IMPORTANCIA

Grupo de Uso	III
Coefficiente de importancia III	1.25
Coefficiente de Sitio \bar{S} :	4.38

ESPECTRO DE UMBRAL DE DAÑO (AMORTIGUAMIENTO $\xi=2\%$ DEL CRÍTICO)

S_{ad} : Valor del espectro de aceleraciones del umbral de daño para un periodo de vibración dado.

A_d : Máxima aceleración pico efectiva para el umbral de daño.

T : Periodo de vibración del sistema elástico, en segundos.

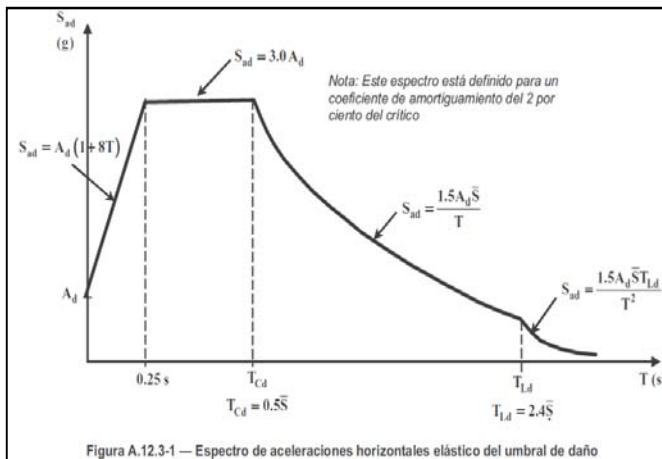
T_{cd} : Periodo de vibración, en segundos, correspondiente a la transición entre la zona de aceleración constante del espectro sísmico del umbral de daño, para periodos cortos, y la parte descendiente del mismo.

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: **0.08**

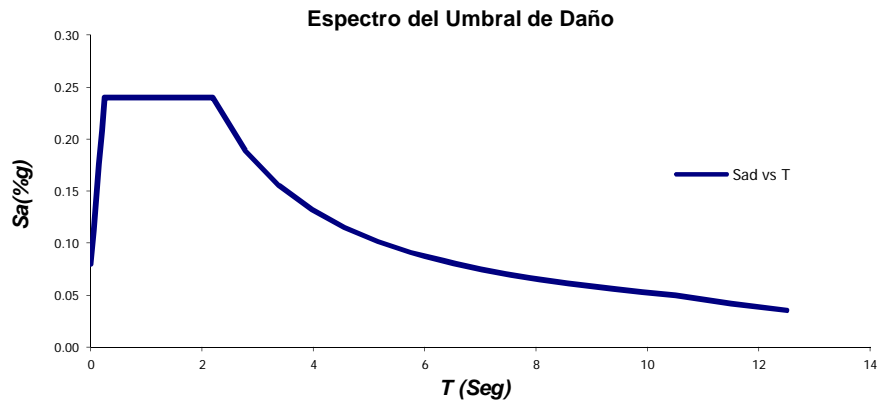
T_{cd} : **2.19 Seg**

T_{ld} : **10.5 Seg**



T (Seg)	Sad (%g)
0.00	0.080
0.05	0.112
0.10	0.144
0.15	0.176
0.20	0.208
0.25	0.240
0.49	0.240
0.73	0.240
0.98	0.240
1.22	0.240
1.46	0.240
1.70	0.240
1.95	0.240
2.19	0.240
2.78	0.189

3.38	0.156
3.97	0.132
4.56	0.115
5.16	0.102
5.75	0.091
6.34	0.083
6.94	0.076
7.53	0.070
8.13	0.065
8.72	0.060
9.31	0.056
9.91	0.053
10.50	0.050
11.50	0.042
12.50	0.035



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 rígidos 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: I. E. EL SUR (IPIALES) - RAMPA
CÁLCULO DEL CORTANTE BASAL DE LA ESTRUCTURA (ESPECTRO DE DISEÑO)

CÁLCULO DEL CORTANTE BASAL DE LA ESTRUCTURA

$H_{\text{edificio}} =$	7.53	m	
Tipo de Perfil:	E		
$A_a =$	0.30	g	
$A_v =$	0.25	g	
$F_a =$	1.20		
$F_v =$	3.00		
$T_c =$	1.00	Seg	
$C_t =$	0.047		
$\alpha =$	0.90		
$T_a =$	0.29	Seg	
$C_u =$	1.20		
$C_u T_a =$	0.35	Seg	
$T_{\text{modelación estructural}} =$	0.2900	Seg	
$\Delta T =$	0.27	%	Ok!
$T_{\text{adoptado}} =$	0.29	Seg	
$S_a =$	1.125		S_a obtenido del espectro de diseño
$g =$	9.81	m/s ²	
$M =$	151.84	Ton	Masa obtenida del modelo
$V_s =$	1675.69	kN	
90% $V_s =$	1508.12	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 (kN)	F2 (kN)	Total (kN)	Factor	g corregido	
$V_{s(x)} =$	953.45	-	953.45	1.582	15.517	Se aplica en SISMO X
$V_{s(y)} =$	-	969.05	969.05	1.556	15.267	Se aplica en SISMO Y

MODELO CORREGIDO
Response Spectrum Base Reactions

	F1 (kN)	F2 (kN)	Total (kN)	90% V_s (kN)
$V_{s(x)} =$	1508.13	-	1508.13	1508.1
$V_{s(y)} =$	-	1508.1	1508.10	1508.1



PROYECTO: I. E. EL SUR (IPIALES) - RAMPA
CÁLCULO DEL CORTANTE BASAL DE LA ESTRUCTURA (ESPECTRO DE UMBRAL DE DAÑO)

CÁLCULO DEL CORTANTE BASAL DE LA ESTRUCTURA

H _{edificio} =	7.53	m	
Tipo de Perfil:	E		
Ad =	0.09	g	
Fv =	3.00		
C _t =	0.047		
α =	0.90		
T _a =	0.29	Seg	
C _u =	1.20		
C _u T _a =	0.35	Seg	
T _{modelación estructural} =	0.29	Seg	
ΔT =	0.27	%	Ok!
T _{adoptado} =	0.2900	Seg	
S _a =	0.240		S _a obtenido del espectro de diseño
g =	9.81	m/s ²	
M =	151.84	Ton	Masa obtenida del modelo
V _s =	357.48	kN	
90% V _s =	321.73	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 (kN)	F2 (kN)	Total (kN)	Factor	g corregido
V _{s(x)} =	199.55		199.55	1.612	15.817
V _{s(y)} =		172.3	172.30	1.867	18.318

MODELO CORREGIDO
Response Spectrum Base Reactions

	F1 (kN)	F2 (kN)	Total (kN)	90% V _s (kN)
V _{s(x)} =	321.75	0	321.75	321.7
V _{s(y)} =	0	321.73	321.73	321.7

4. DISEÑO DE CIMENTACIÓN

DISEÑO DE CIMENTACIÓN

DISEÑO VIGAS DE AMARRE

PROYECTO: I. E. EL SUR (IPIALES) - RAMPA

VIGA DE AMARRE TIPO

$$f'_c = \boxed{21.1} \text{ MPa}$$

$$f_y = \boxed{420} \text{ MPa}$$

$$b = \boxed{0.40} \text{ m}$$

$$h = \boxed{0.50} \text{ m}$$

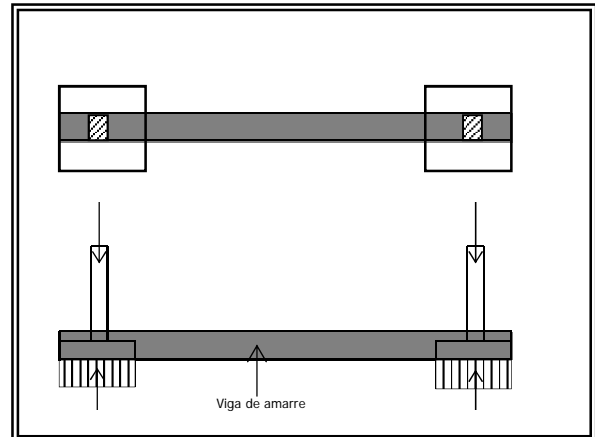
$$P_{\text{máx}} = 968.09 \text{ kN}$$

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

$$A_a = \boxed{0.30}$$

$$P_{\text{axial}} = 0.25 * A_a * P_{\text{máx}}$$

$$P_{\text{axial}} = 72.6 \text{ kN}$$



DISEÑO A TENSIÓN

$$A_s = 1.7 * 72.60675 / (0.90 * 420)$$

$$A_s = \boxed{3.27} \text{ cm}^2$$

DISEÑO A COMPRESIÓN

$$P_{\text{com}} = 1.7 * 72.60675$$

$$P_{\text{com}} = 123.4 \text{ kN}$$

Para esta carga la sección requiere cuantía mínima:

$$A_s = 0.00333 * 0.4 * 0.45$$

$$A_s = \boxed{5.99} \text{ cm}^2$$

Se suministra un refuerzo constituido por 4#5 arriba y 4#4 abajo (como refuerzo mínimo).

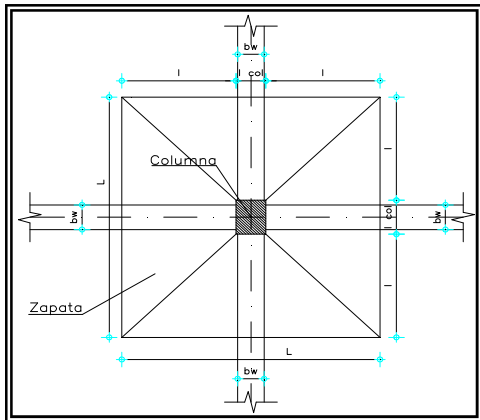
DISEÑO DE ZAPATAS RECTANGULAR
PROYECTO: I. E. EL SUR (IPIALES) - RAMPA
ZAPATA TIPO 5 (Und. 1)

Columna **b = 80** cm
 t = 80 cm

f'c = 21.1 MPa
fy = 420 MPa

σ = 0.145 MPa

PREDIMENSIONAMIENTO



L = 4.100 m
lcol = 0.800 m
l = 1.650 m

Cargas

Mu =	91	kN*m
Pu =	968.09	kN
Pp (10%) =	97	kN
Σ P =	1065	kN

$$\text{Area necesaria} = \frac{\Sigma P}{\sigma} = \frac{1064.90}{0.145} = 7.34 \text{ m}^2$$

e = 0.09 m **L = 4.10** m
L = 2.710 m Aproximamos **B = 2.10** m

$$\text{Carga de diseño} = \frac{Pu}{A \text{ real}} = \frac{968.09}{8.610} = 0.112 \text{ MPa}$$

Esfuerzos

σmáx =	0.141	MPa	OK
σmin =	0.091	MPa	OK

DISEÑO DE ZAPATA RECTANGULAR

FLEXIÓN

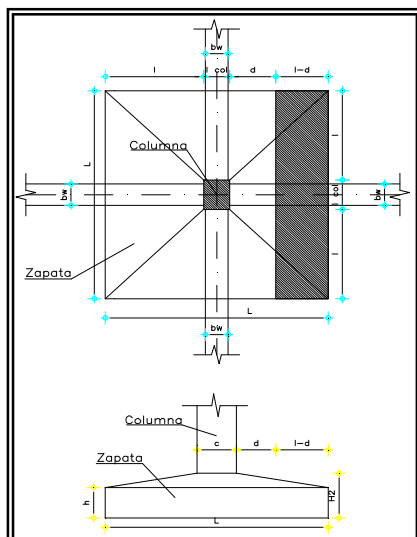
M borde de la columna = 209.52 kN*m
Mu = 1,7 * M borde de la columna = 356.19 kN*m

Con el criterio de calcular el refuerzo por metro lineal utilizamos una altura efectiva igual a:

d = 0.63 m
Cuantia = 0.0021932
As = 13.82 cm²/m

Armadura: 30#524c./0.14 long.
15#544c./0.14 Transv.

CORTANTE



a. En una dirección (d)

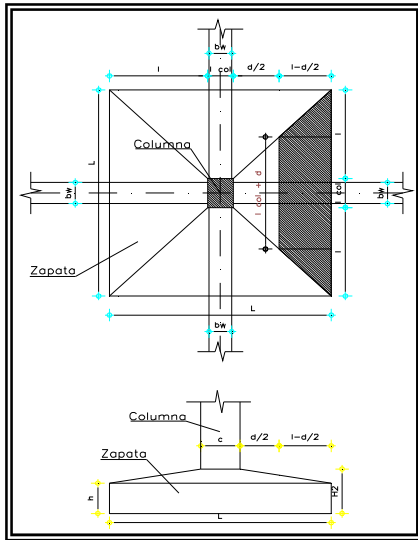
L = 4.10 m
l = 1.65 m
l - d = 1.02 m

H = 0.70 m
h = 0.30 m
H-h = 0.40 m

V (d) = 562.18 kN
Vu (d) = 1.7*V(d)
Vu (d) = 955.71 kN
h' = 0.49 m

$$v_v = \frac{Vu}{L * h'} = 0.481 \text{ MPa}$$

$$\phi_{vc} = 0.574 \text{ MPa} \quad \text{OK}$$



b. En dos direcciones (d/2)

$$\begin{aligned} L &= 4.100 \text{ m} \\ d/2 &= 0.315 \text{ m} \\ l - d/2 &= 1.335 \text{ m} \end{aligned}$$

$$\begin{aligned} V(d/2) &= 489.1 \text{ kN} \\ Vu(d/2) &= 1.5 \cdot V(d) \\ Vu(d/2) &= 733.7 \text{ kN} \\ d_1 &= 0.56375 \text{ m} \end{aligned}$$

ZAPATA TIPO 5 (Und. 1)

$$\begin{aligned} H &= 0.70 \text{ m} \\ h &= 0.30 \text{ m} \\ H-h &= 0.40 \text{ m} \end{aligned}$$

$$vu = \frac{Vu}{bo \times d_1} = 0.910 \text{ MPa}$$

$$\phi_{vc} = 1.15 \text{ MPa OK}$$

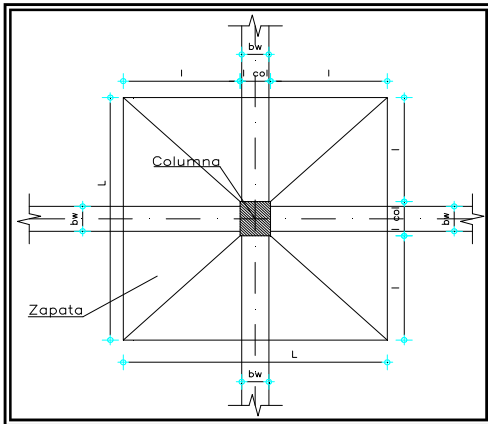
DISEÑO DE ZAPATAS RECTANGULAR
PROYECTO: I. E. EL SUR (IPIALES) - RAMPA
ZAPATA TIPO 6 (Und. 1)

Columna **b** = 70 cm
t = 90 cm

f'c = 21.1 MPa
fy = 420 MPa

σ = 0.145 MPa

PREDIMENSIONAMIENTO



L = 3.800 m
lcol = 0.900 m
l = 1.450 m

Cargas
Mu = 103 kN*m
Pu = 696.81 kN
Pp (10%) = 70 kN
Σ P = 766 kN

$$\text{Area necesaria} = \frac{\Sigma P}{\sigma} = \frac{766.49}{0.145} = 5.29 \text{ m}^2$$

e = 0.15 m
L = 2.299 m
L = 3.80 m
Aproximamos B = 1.90 m

$$\text{Carga de diseño} = \frac{Pu}{A \text{ real}} = \frac{696.81}{7.220} = 0.097 \text{ MPa}$$

Esfuerzos
σmáx = 0.131 MPa OK
σmin = 0.057 MPa OK

DISEÑO DE ZAPATA RECTANGULAR

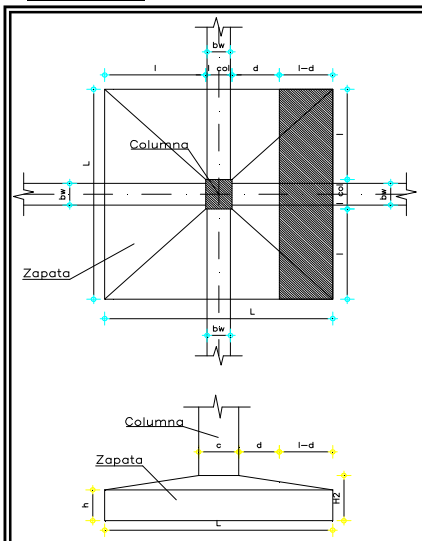
FLEXIÓN

M borde de la columna = 160.02 kN*m
Mu = 1.7 * M borde de la columna = 272.04 kN*m

Con el criterio de calcular el refuerzo por metro lineal utilizamos una altura efectiva igual a:

d = 0.43 m
Cuantia = 0.00366037
As = 15.74 cm²/m

CORTANTE



a. En una dirección (d)

L = 3.80 m
l = 1.45 m
l - d = 1.02 m

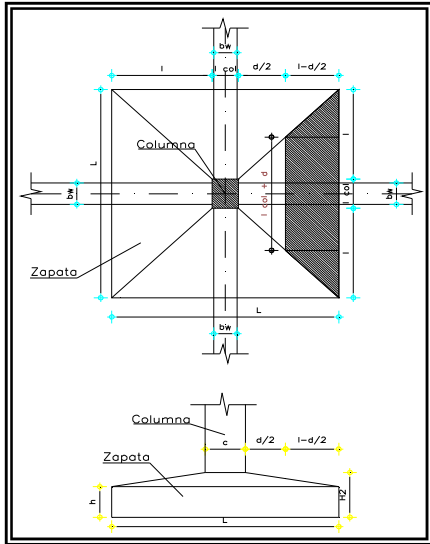
H = 0.50 m
h = 0.30 m
H-h = 0.20 m

V (d) = 468.97 kN
Vu (d) = 1.7*V(d)
Vu (d) = 797.24 kN
h' = 0.38 m

$$\sigma_v = \frac{Vu}{L * h'} = 0.558 \text{ MPa}$$

φvc = 0.57 MPa OK

Armadura: 29#522c./0.13 long.
15#541c./0.13 Transv.



b. En dos direcciones (d/2)

$$\begin{aligned} L &= 3.800 \text{ m} \\ d/2 &= 0.215 \text{ m} \\ l - d/2 &= 1.235 \text{ m} \end{aligned}$$

$$\begin{aligned} V(d/2) &= 376.6 \text{ kN} \\ V_u(d/2) &= 1.5 \cdot V(d) \\ V_u(d/2) &= 564.9 \text{ kN} \\ d_1 &= 0.40642857 \text{ m} \end{aligned}$$

ZAPATA TIPO 6 (Und. 1)

$$\begin{aligned} H &= 0.50 \text{ m} \\ h &= 0.30 \text{ m} \\ H-h &= 0.20 \text{ m} \end{aligned}$$

$$v_u = \frac{V_u}{b_o \times d_1} = 1.045 \text{ MPa}$$

$$\phi_{vc} = 1.15 \text{ MPa OK}$$

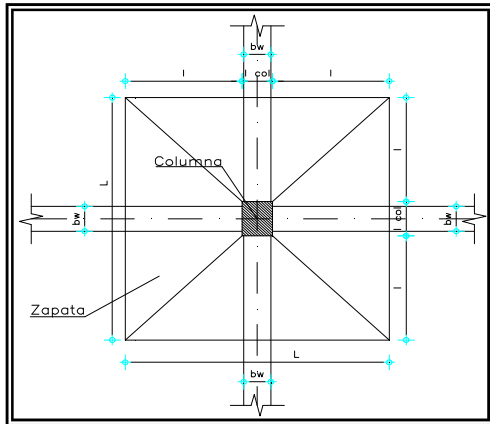
DISEÑO DE ZAPATAS RECTANGULAR
PROYECTO: I. E. EL SUR (IPIALES) - RAMPA
ZAPATA TIPO 7 (Und. 1)

Columna **b** = 70 cm
t = 90 cm

f'c = 21.1 MPa
fy = 420 MPa

σ = 0.145 MPa

PREDIMENSIONAMIENTO



L = 3.600 m
lcol = 0.900 m
l = 1.350 m

Cargas
Mu = 85 kN*m
Pu = 702.16 kN
Pp (10%) = 70 kN
Σ P = 772 kN

$$\text{Area necesaria} = \frac{\Sigma P}{\sigma} = \frac{772.38}{0.145} = 5.33 \text{ m}^2$$

e = 0.12 m
L = 2.308 m
L = 3.60 m
Aproximamos B = 1.80 m

$$\text{Carga de diseño} = \frac{Pu}{A \text{ real}} = \frac{702.16}{6.480} = 0.108 \text{ MPa}$$

Esfuerzos
σmáx = 0.143 MPa OK
σmin = 0.071 MPa OK

DISEÑO DE ZAPATA RECTANGULAR

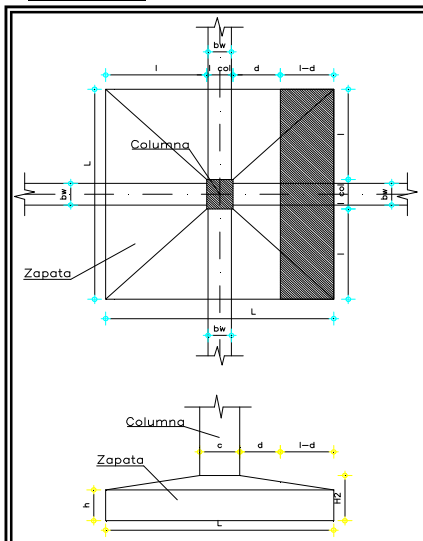
FLEXIÓN

M borde de la columna = 149.72 kN*m
Mu = 1.7 * M borde de la columna = 254.52 kN*m

Con el criterio de calcular el refuerzo por metro lineal utilizamos una altura efectiva igual a:

d = 0.43 m
Cuantia = 0.00341437
As = 14.68 cm²/m

CORTANTE



a. En una dirección (d)

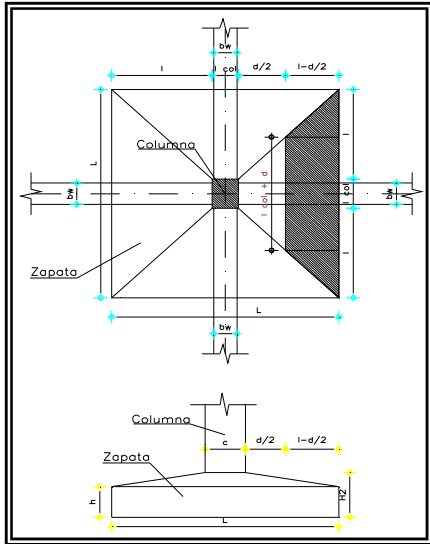
L = 3.60 m
l = 1.35 m
l - d = 0.92 m

H = 0.50 m
h = 0.30 m
H-h = 0.20 m

V (d) = 443.90 kN
Vu (d) = 1.7*V(d)
Vu (d) = 754.64 kN
h' = 0.37 m

$$\sigma_v = \frac{Vu}{L * h'} = 0.564 \text{ MPa}$$

φvc = 0.57 MPa OK



b. En dos direcciones (d/2)

$$\begin{aligned} L &= 3.600 \text{ m} \\ d/2 &= 0.215 \text{ m} \\ l - d/2 &= 1.135 \text{ m} \end{aligned}$$

$$\begin{aligned} V(d/2) &= 369.0 \text{ kN} \\ V_u(d/2) &= 1.5 \cdot V(d) \\ V_u(d/2) &= 553.4 \text{ kN} \\ d_1 &= 0.40461538 \text{ m} \end{aligned}$$

ZAPATA TIPO 7 (Und. 1)

$$\begin{aligned} H &= 0.50 \text{ m} \\ h &= 0.30 \text{ m} \\ H-h &= 0.20 \text{ m} \end{aligned}$$

$$v_u = \frac{V_u}{b_o \times d_1} = 1.028 \text{ MPa}$$

$$\phi_{vc} = 1.15 \text{ MPa OK}$$

5. DISEÑO DE VIGAS Y COLUMNAS

*DISEÑO DE VIGAS Y
COLUMNAS*

PROYECTO: I. E. EL SUR (IPIALES) - RAMPA

VR-01/BASE

B=0.40 H=0.50 L=1.95		
Mu=-2.27 As=0.00 As(r)=5.89	Mu=-1.99 As=7.92 As(r)=5.89	
Mu=1.67 As=7.92 As(r)=5.89		
Vu=-6.41	Vu=6.41	Vu=-3.41

VL-01/N-0.5

B=0.15 H=0.50 L=8.70			B=0.15 H=0.50 L=0.45		
Mu=-74.26 As=5.70 As(r)=4.81	Mu=-66.54 As=5.70 As(r)=4.27		Mu=-3.90 As=5.70 As(r)=2.21	Mu=-5.10 As=0.00 As(r)=2.21	
Mu=77.93 As=5.70 As(r)=5.08			Mu=1.28 As=5.70 As(r)=2.21		
Vu=-65.64	Vu=-2.80	Vu=63.95	Vu=-1.94	Vu=2.86	Vu=4.04

VL-02/N-0.5

B=0.15 H=0.50 L=8.25			B=0.15 H=0.50 L=0.25		
Mu=-90.75 As=7.76 As(r)=6.02	Mu=-90.04 As=7.76 As(r)=5.97		Mu=-90.75 As=7.76 As(r)=6.02	Mu=-90.04 As=0.00 As(r)=5.97	
Mu=57.94 As=5.70 As(r)=3.67			Mu=57.94 As=5.70 As(r)=3.67		
Vu=-64.87	Vu=-1.80	Vu=64.71	Vu=-64.87	Vu=-1.80	Vu=64.71

VL-03/N-0.5

B=0.15 H=0.50 L=0.25			B=0.15 H=0.50 L=8.30			B=0.15 H=0.50 L=8.60		
Mu=-0.00 As=0.00 As(r)=2.21	Mu=-9.34 As=7.76 As(r)=2.21		Mu=-84.04 As=7.76 As(r)=5.52	Mu=-110.33 As=10.14 As(r)=7.55		Mu=-111.69 As=10.14 As(r)=7.66	Mu=-96.01 As=7.76 As(r)=6.42	
Mu=1.46 As=0.99 As(r)=2.21			Mu=53.06 As=3.96 As(r)=3.34			Mu=55.16 As=3.96 As(r)=3.49		
Vu=-19.07	Vu=-20.73	Vu=-22.39	Vu=-62.41	Vu=-4.61	Vu=69.84	Vu=-68.52	Vu=-6.82	Vu=-65.59

B=0.15 H=0.50 L=1.95		
Mu=-40.08 As=7.76 As(r)=2.49	Mu=-0.00 As=0.00 As(r)=2.21	
Mu=0.00 As=3.96 As(r)=2.21		
Vu=-33.73	Vu=-22.50	Vu=-12.14

PROYECTO: I. E. EL SUR (IPIALES) - RAMPA

VL-04/N-0.5

B=0.15 H=0.50 L=0.45			B=0.15 H=0.50 L=8.70			B=0.15 H=0.50 L=9.25		
Mu=-4.59 As=0.00 As(r)=2.21	Mu=-3.79 As=5.70 As(r)=2.21		Mu=-59.74 As=5.70 As(r)=3.80	Mu=-111.88 As=10.14 As(r)=7.67		Mu=-114.13 As=10.14 As(r)=7.85	Mu=-76.16 As=5.70 As(r)=4.95	
Mu=1.15 As=5.70 As(r)=2.21			Mu=62.08 As=5.70 As(r)=3.96			Mu=62.81 As=5.70 As(r)=4.01		
Vu=4.25	Vu=3.06	Vu=1.88	Vu=58.77	Vu=-3.27	Vu=63.56	Vu=66.59	Vu=-5.06	Vu=-62.78

B=0.15 H=0.50 L=1.95		
Mu=-30.40 As=5.70 As(r)=2.21	Mu=-3.85 As=0.00 As(r)=2.21	
Mu=0.00 As=5.70 As(r)=2.21		
Vu=-21.50	Vu=-13.65	Vu=-5.82

VR-02/N-0.5

B=0.40 H=0.50 L=1.95			B=0.40 H=0.50 L=1.95		
Mu=-0.00 As=0.00 As(r)=5.89	Mu=-182.15 As=15.52 As(r)=11.71		Mu=-184.84 As=15.52 As(r)=11.90	Mu=-0.00 As=0.00 As(r)=5.89	
Mu=0.00 As=7.92 As(r)=5.89			Mu=0.00 As=7.92 As(r)=5.89		
Vu=60.70	Vu=70.24	Vu=164.55	Vu=-161.92	Vu=-70.22	Vu=-59.72

VR-03/N-0.5

B=0.15 H=0.50 L=1.80			B=0.15 H=0.50 L=0.50			B=0.15 H=0.50 L=1.80		
Mu=-5.72 As=2.54 As(r)=2.21	Mu=-22.78 As=2.54 As(r)=2.21		Mu=-25.29 As=2.54 As(r)=2.21	Mu=-24.82 As=2.54 As(r)=2.21		Mu=-23.02 As=2.54 As(r)=2.21	Mu=-5.40 As=2.54 As(r)=2.21	
Mu=0.00 As=2.54 As(r)=2.21			Mu=6.32 As=2.54 As(r)=2.21			Mu=0.00 As=2.54 As(r)=2.21		
Vu=4.04	Vu=8.75	Vu=14.05	Vu=-7.52	Vu=-6.77	Vu=7.28	Vu=-14.33	Vu=-9.03	Vu=-4.25

VR-04/N+0.31

B=0.15 H=0.50 L=1.80		
Mu=-11.03 As=2.54 As(r)=2.21	Mu=-3.84 As=2.54 As(r)=2.21	
Mu=2.76 As=2.54 As(r)=2.21		
Vu=-9.80	Vu=-4.46	Vu=2.64

PROYECTO: I. E. EL SUR (IPIALES) - RAMPA

VR-05/N+0.31

B=0.40 H=0.50 L=1.95		
Mu=-394.23 As=33.92 As(r)=30.83	Mu=-0.00 As=0.00 As(r)=5.89	
Mu=0.00 As=11.40 As(r)=5.89		
Vu=-296.03	Vu=-145.50	Vu=-130.15

VR-06/N+0.31

B=0.15 H=0.50 L=1.80		
Mu=-11.18 As=2.54 As(r)=2.21	Mu=-3.76 As=2.54 As(r)=2.21	
Mu=2.79 As=2.54 As(r)=2.21		
Vu=-9.85	Vu=-4.31	Vu=2.42

VL-05/N+1.12

B=0.15 H=0.50 L=1.95			B=0.15 H=0.50 L=8.60			B=0.15 H=0.50 L=8.30		
Mu=-0.00 As=0.00 As(r)=2.21	Mu=-40.48 As=7.76 As(r)=2.51	Mu=-96.56 As=7.76 As(r)=6.46	Mu=-112.37 As=10.14 As(r)=7.71	Mu=-111.40 As=10.14 As(r)=7.63	Mu=-82.31 As=7.76 As(r)=5.39			
Mu=0.00 As=3.96 As(r)=2.21			Mu=55.08 As=3.96 As(r)=3.48			Mu=53.62 As=3.96 As(r)=3.38		
Vu=-11.52	Vu=-22.75	Vu=-33.99	Vu=65.70	Vu=-8.89	Vu=-70.38	Vu=-69.92	Vu=7.62	Vu=62.13

B=0.15 H=0.50 L=0.25		
Mu=-9.85 As=7.76 As(r)=2.21	Mu=-0.00 As=0.00 As(r)=2.21	
Mu=1.53 As=3.96 As(r)=2.21		
Vu=-22.56	Vu=-20.90	Vu=-19.23

VR-07/N+1.12

B=0.40 H=0.50 L=1.95			B=0.40 H=0.50 L=1.95		
Mu=-0.44 As=0.00 As(r)=5.89	Mu=-258.05 As=20.28 As(r)=17.27	Mu=-253.31 As=20.28 As(r)=16.91	Mu=-0.00 As=0.00 As(r)=5.89		
Mu=0.00 As=11.40 As(r)=5.89		Mu=0.00 As=11.40 As(r)=5.89			
Vu=85.60	Vu=99.85	Vu=211.52	Vu=-211.04	Vu=-97.70	Vu=-83.45

PROYECTO: I. E. EL SUR (IPIALES) - RAMPA

VR-08/N+1.12

B=0.15 H=0.50 L=1.80			B=0.15 H=0.50 L=0.50			B=0.15 H=0.50 L=1.80		
Mu=-5.31 As=2.54 As(r)=2.21	Mu=-9.97 As=2.54 As(r)=2.21	Mu=-10.90 As=2.54 As(r)=2.21	Mu=-11.66 As=2.54 As(r)=2.21	Mu=-10.07 As=2.54 As(r)=2.21	Mu=-4.90 As=2.54 As(r)=2.21			
Mu=2.49 As=2.54 As(r)=2.21		Mu=2.91 As=2.54 As(r)=2.21		Mu=2.52 As=2.54 As(r)=2.21				
Vu=-6.39	Vu=4.41	Vu=10.11	Vu=-3.17	Vu=-1.86	Vu=2.93	Vu=-9.91	Vu=-4.57	Vu=5.82

VR-09/N+1.937

B=0.15 H=0.50 L=1.80		
Mu=-4.03 As=2.54 As(r)=2.21	Mu=-11.14 As=2.54 As(r)=2.21	
Mu=2.79 As=2.54 As(r)=2.21		
Vu=-2.62	Vu=4.38	Vu=9.77

VR-10/N+1.937

B=0.40 H=0.50 L=1.95		
Mu=-0.00 As=0.00 As(r)=5.89	Mu=-396.79 As=33.92 As(r)=30.98	
Mu=0.00 As=11.40 As(r)=5.89		
Vu=130.93	Vu=146.29	Vu=298.76

VR-11/N+1.937

B=0.15 H=0.50 L=1.80		
Mu=-4.31 As=2.54 As(r)=2.21	Mu=-11.07 As=2.54 As(r)=2.21	
Mu=2.77 As=2.54 As(r)=2.21		
Vu=-2.88	Vu=4.74	Vu=9.83

VL-06/N+2.75

B=0.15 H=0.50 L=1.95			B=0.15 H=0.50 L=9.20			B=0.15 H=0.50 L=8.70		
Mu=-4.10 As=0.00 As(r)=2.21	Mu=-30.58 As=7.76 As(r)=2.21	Mu=-82.52 As=7.76 As(r)=5.41	Mu=-112.77 As=10.14 As(r)=7.74	Mu=-114.63 As=10.14 As(r)=7.90	Mu=-60.34 As=5.70 As(r)=3.84			
Mu=0.00 As=5.70 As(r)=2.21		Mu=62.24 As=5.70 As(r)=3.97		Mu=62.99 As=5.70 As(r)=4.02				
Vu=-6.39	Vu=-13.68	Vu=-21.54	Vu=-62.97	Vu=-5.43	Vu=-64.57	Vu=-66.36	Vu=-4.61	Vu=58.31

PROYECTO: I. E. EL SUR (IPIALES) - RAMPA

B=0.15 H=0.50 L=0.45		
Mu=-3.98 As=5.70 As(r)=2.21	Mu=-4.64 As=0.00 As(r)=2.21	
Mu=1.18 As=5.70 As(r)=2.21		
Vu=3.06	Vu=3.75	Vu=4.66

VL-08/N+2.75

B=0.15 H=0.50 L=0.45			B=0.15 H=0.50 L=8.70			B=0.15 H=0.50 L=9.20		
Mu=-4.86 As=0.00 As(r)=2.21	Mu=-4.30 As=7.76 As(r)=2.21	Mu=-63.44 As=7.76 As(r)=4.05	Mu=-112.55 As=10.14 As(r)=7.73	Mu=-117.88 As=10.14 As(r)=8.16	Mu=-82.88 As=5.70 As(r)=5.44			
Mu=1.28 As=5.70 As(r)=2.21			Mu=61.98 As=5.70 As(r)=3.95			Mu=63.72 As=5.70 As(r)=4.07		
Vu=5.27	Vu=4.26	Vu=3.57	Vu=58.59	Vu=-4.80	Vu=-63.05	Vu=-68.68	Vu=6.12	Vu=62.25

B=0.15 H=0.50 L=1.95		
Mu=-29.71 As=5.70 As(r)=2.21	Mu=-4.21 As=0.00 As(r)=2.21	
Mu=0.49 As=5.70 As(r)=2.21		
Vu=-21.22	Vu=-13.37	Vu=-6.19

VR-12/N+2.75

B=0.40 H=0.50 L=1.95			B=0.40 H=0.50 L=1.95		
Mu=-0.00 As=0.00 As(r)=5.89	Mu=-176.43 As=15.52 As(r)=11.31	Mu=-185.05 As=15.52 As(r)=11.91	Mu=-0.20 As=0.00 As(r)=5.89		
Mu=0.00 As=7.92 As(r)=5.89			Mu=0.00 As=7.92 As(r)=5.89		
Vu=56.30	Vu=66.80	Vu=158.72	Vu=-163.74	Vu=-69.96	Vu=-59.46

VR-13/N+2.75

B=0.15 H=0.50 L=1.80			B=0.15 H=0.50 L=0.50			B=0.15 H=0.50 L=1.80		
Mu=-5.31 As=2.54 As(r)=2.21	Mu=-23.88 As=2.54 As(r)=2.21	Mu=-25.92 As=2.54 As(r)=2.21	Mu=-26.64 As=2.54 As(r)=2.21	Mu=-24.60 As=2.54 As(r)=2.21	Mu=-5.56 As=2.54 As(r)=2.21			
Mu=0.00 As=2.54 As(r)=2.21			Mu=6.66 As=2.54 As(r)=2.21			Mu=0.00 As=2.54 As(r)=2.21		
Vu=4.66	Vu=9.64	Vu=14.93	Vu=-6.20	Vu=6.55	Vu=7.86	Vu=-15.16	Vu=-9.87	Vu=-5.27

PROYECTO: I. E. EL SUR (IPIALES) - RAMPA

VR-14/N+3.56

B=0.15 H=0.50 L=1.80		
Mu=-11.05 As=2.54 As(r)=2.21		Mu=-4.28 As=2.34 As(r)=2.21
Mu=2.76 As=2.54 As(r)=2.21		
Vu=-9.74	Vu=-4.58	Vu=2.85

VR-15/N+3.56

B=0.40 H=0.50 L=1.95		
Mu=-399.17 As=33.92 As(r)=31.11		Mu=-0.00 As=0.00 As(r)=5.89
Mu=0.00 As=11.40 As(r)=5.89		
Vu=-300.84	Vu=-147.08	Vu=-131.73

VR-16/N+3.56

B=0.15 H=0.50 L=1.80		
Mu=-11.12 As=2.54 As(r)=2.21		Mu=-4.93 As=2.54 As(r)=2.21
Mu=2.78 As=2.54 As(r)=2.21		
Vu=-9.85	Vu=-5.05	Vu=3.36

VL-07/N+4.37

B=0.15 H=0.50 L=0.25			B=0.15 H=0.50 L=8.30			B=0.15 H=0.50 L=8.60		
Mu=-0.00 As=0.00 As(r)=2.21			Mu=-11.26 As=7.76 As(r)=2.21			Mu=-114.26 As=10.14 As(r)=7.87		Mu=-93.90 As=7.76 As(r)=6.26
Mu=1.83 As=0.98 As(r)=2.21			Mu=53.32 As=3.96 As(r)=3.36			Mu=56.09 As=3.96 As(r)=3.55		
Vu=-21.60	Vu=-23.26	Vu=-24.93	Vu=-62.15	Vu=9.67	Vu=-72.92	Vu=-75.60	Vu=8.09	Vu=65.32

B=0.15 H=0.50 L=1.95		
Mu=-40.32 As=7.76 As(r)=2.50		Mu=-0.00 As=3.88 As(r)=2.21
Mu=0.00 As=3.96 As(r)=2.21		
Vu=-33.82	Vu=-22.58	Vu=-12.32

PROYECTO: I. E. EL SUR (IPIALES) - RAMPA

VL-09/N+4.37

B=0.15 H=0.50 L=1.95			B=0.15 H=0.50 L=8.60			B=0.15 H=0.50 L=8.30		
Mu=-0.00 As=0.00 As(r)=2.21	Mu=-41.11 As=7.76 As(r)=2.55	Mu=-94.18 As=7.76 As(r)=6.28	Mu=-111.29 As=10.14 As(r)=7.62	Mu=-115.13 As=10.14 As(r)=7.94	Mu=-81.49 As=7.76 As(r)=5.33			
Mu=0.00 As=3.96 As(r)=2.21			Mu=55.62 As=5.70 As(r)=3.52			Mu=54.28 As=5.70 As(r)=3.43		
Vu=-12.17	Vu=-23.09	Vu=-34.33	Vu=65.28	Vu=-10.03	Vu=-67.52	Vu=-75.45	Vu=7.92	Vu=62.09

B=0.15 H=0.50 L=0.25		
Mu=-2.85 As=7.76 As(r)=2.21	Mu=-0.28 As=0.00 As(r)=2.21	
Mu=3.17 As=3.96 As(r)=2.21		
Vu=-6.58	Vu=-5.40	Vu=-4.22

VR-17/N+4.37

B=0.40 H=0.50 L=1.95			B=0.40 H=0.50 L=1.95		
Mu=-1.45 As=0.00 As(r)=5.89	Mu=-261.98 As=20.28 As(r)=17.58	Mu=-246.89 As=20.28 As(r)=16.42	Mu=-0.00 As=0.00 As(r)=5.89		
Mu=0.00 As=11.40 As(r)=5.89			Mu=0.00 As=11.40 As(r)=5.89		
Vu=86.51	Vu=100.76	Vu=215.68	Vu=-205.94	Vu=-95.45	Vu=-81.20

VR-18/N+4.37

B=0.15 H=0.50 L=1.80			B=0.15 H=0.50 L=0.50			B=0.15 H=0.50 L=1.80		
Mu=-5.64 As=2.54 As(r)=2.21	Mu=-10.29 As=2.54 As(r)=2.21	Mu=-11.67 As=2.54 As(r)=2.21	Mu=-11.92 As=2.54 As(r)=2.21	Mu=-10.97 As=2.54 As(r)=2.21	Mu=-5.29 As=2.54 As(r)=2.21			
Mu=2.57 As=2.54 As(r)=2.21			Mu=2.98 As=2.54 As(r)=2.21			Mu=2.74 As=2.54 As(r)=2.21		
Vu=-6.41	Vu=4.91	Vu=10.33	Vu=-3.84	Vu=-2.52	Vu=3.28	Vu=-10.40	Vu=-5.33	Vu=6.19

VR-19/N+5.187

B=0.15 H=0.50 L=1.80		
Mu=-3.91 As=2.54 As(r)=2.21	Mu=-11.18 As=2.54 As(r)=2.21	
Mu=2.79 As=2.54 As(r)=2.21		
Vu=-2.56	Vu=4.42	Vu=9.84

PROYECTO: I. E. EL SUR (IPIALES) - RAMPA

VR-20/N+5.187

B=0.40 H=0.50 L=1.95		
Mu=-0.00 As=0.00 As(r)=5.89	Mu=-395.73 As=33.92 As(r)=30.92	
Mu=0.00 As=11.40 As(r)=5.89		
Vu=130.16	Vu=145.51	Vu=300.66

VR-21/N+5.187

B=0.15 H=0.50 L=1.80		
Mu=-5.14 As=2.54 As(r)=2.21	Mu=-10.80 As=2.54 As(r)=2.21	
Mu=2.70 As=1.42 As(r)=2.21		
Vu=-3.73	Vu=5.13	Vu=9.92

VL-10/N+6.00

B=0.15 H=0.50 L=1.95			B=0.15 H=0.50 L=9.20			B=0.15 H=0.50 L=8.70		
Mu=-4.43 As=0.00 As(r)=2.21	Mu=-30.39 As=7.76 As(r)=2.21		Mu=-86.55 As=7.76 As(r)=5.71	Mu=-113.14 As=10.14 As(r)=7.77		Mu=-114.91 As=10.14 As(r)=7.92	Mu=-62.43 As=5.70 As(r)=3.98	
Mu=0.00 As=5.70 As(r)=2.21			Mu=62.49 As=5.70 As(r)=3.99			Mu=62.79 As=5.70 As(r)=4.01		
Vu=-6.41	Vu=-13.55	Vu=-21.40	Vu=-63.10	Vu=-6.41	Vu=-63.44	Vu=-66.72	Vu=-4.73	Vu=58.34

B=0.15 H=0.50 L=0.45		
Mu=-9.25 As=5.70 As(r)=2.21	Mu=-4.04 As=0.00 As(r)=2.21	
Mu=0.00 As=5.70 As(r)=2.21		
Vu=-9.70	Vu=-8.36	Vu=-7.02

VR-22/N+6.00

B=0.40 H=0.50 L=1.95		
Mu=-0.00 As=0.00 As(r)=5.89	Mu=-199.19 As=15.52 As(r)=12.92	
Mu=0.00 As=7.92 As(r)=5.89		
Vu=67.58	Vu=78.08	Vu=150.35

PROYECTO: I. E. EL SUR (IPIALES) - RAMPA

VR-23/N+6.00

B=0.15 H=0.50 L=1.80		
Mu=-5.91 As=2.54 As(r)=2.21		Mu=-2.75 As=2.34 As(r)=2.21
Mu=1.48 As=2.54 As(r)=2.21		
Vu=-7.02	Vu=-2.32	Vu=4.22

PROYECTO: I. E. EL SUR (IPIALES) - RAMPA

Columna E'-1'

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N+4.37	2.76	.50	.80	.80	-87.05	23.48	-221.94	183.63	192.45	24/#6 (1.1%)	0.33	2.45	
					-593.95	-200.24				24/#6 #7 (1.3%)	0.56		
N+1.12	2.14	.50	.80	.80	636.51	186.36	-345.08	268.40	398.44	24/#6 #7 (1.3%)	0.78	5.59	
					-494.16	-1218.03				24/#7 (1.5%)	0.99		

Columna E'-3'

Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N+6.00	2.75	.50	.80	.80	-209.89	-130.81	-190.75	211.73	83.28	24/#8 (1.9%)	0.28	7.90	
					-761.08	-24.06				24/#8 (1.9%)	0.48		
N+2.75	2.75	.50	.80	.80	-836.66	-231.51	-534.24	359.01	288.38	24/#8 (1.9%)	0.77	10.35	
					-1824.88	-173.55				24/#8 (1.9%)	1.11		
N-0.5	.53	.50	.80	.80	-1723.10	-310.53	-450.08	392.59	451.44	24/#8 (1.9%)	1.17	10.52	
					-2095.80	-451.01				24/#8 (1.9%)	1.32		

Columna E'-2'

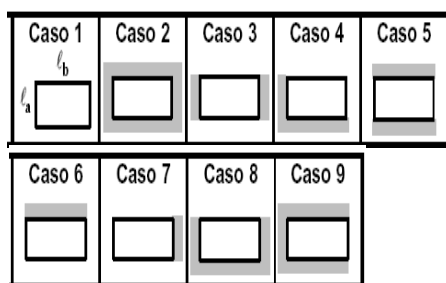
Nivel	H Libre	Losa	B	H	M1	M2	P	V1	V2	Cuantia	m/mr	Col/Vig Eje ppal	Col/vig Eje sec
N+5.187	1.13	.50	.80	.80	-346.80	-40.63	-281.23	241.78	118.92	28/#8 (2.2%)	0.29	4.85	
					-683.78	-48.95				28/#8 (2.2%)	0.38		
N+3.56	1.12	.50	.80	.80	379.58	47.90	-254.89	385.64	185.79	28/#8 (2.2%)	0.39	9.78	
					951.27	95.26				28/#8 (2.2%)	0.53		
N+1.937	1.14	.50	.80	.80	-1290.10	-72.04	-823.75	474.75	232.59	28/#8 (2.2%)	0.87	9.96	
					-1992.88	-147.43				28/#8 (2.2%)	1.03		
N+0.31	1.33	.50	.80	.80	-1741.01	-139.48	-530.93	516.31	302.86	28/#8 (2.2%)	1.16	10.13	
					-2571.36	-335.72				28/#8 (2.2%)	1.39		

6. DISEÑO DE ELEMENTOS COMPLEMENTARIOS

*DISEÑO DE ELEMENTOS
COMPLEMENTARIOS*

PROYECTO: I.E DEL SUR (IPIALES) - RAMPA DISEÑO PLACA MACIZA (EN UNA DIRECCIÓN)

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

$$l_a = 1.80 \text{ m} \quad f_y = 420 \text{ MPa}$$

$$l_b = 9.25 \text{ m} \quad f'_c = 21 \text{ MPa}$$

$$\text{Relación } m = 0.195$$

$$h = l/20 (0.4 + f_y/700) = 0.09 \text{ m}$$

$$\text{Espesor escogido: } 0.10 \text{ m}$$

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/m ²
Impermeabilización	0.05x20	1.00	kN/m ²
Carga Muerta Total		3.40	kN/m²
Carga Viva		5.00	kN/m²
Carga Última		12.08	kN/m²

DISEÑO A MOMENTO FLECTOR

$$M_u = 4.89 \text{ kN.m}$$

$$\text{Cuantía: } 0.0024 \quad A_s = 2.45 \text{ cm}^2/\text{m} \quad \text{Transversal}$$

$$\text{Cuantía: } 0.0018 \quad A_s = 1.80 \text{ cm}^2/\text{m} \quad \text{Longitudinal}$$

Distribución de refuerzo:

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

REVISIÓN A CORTANTE

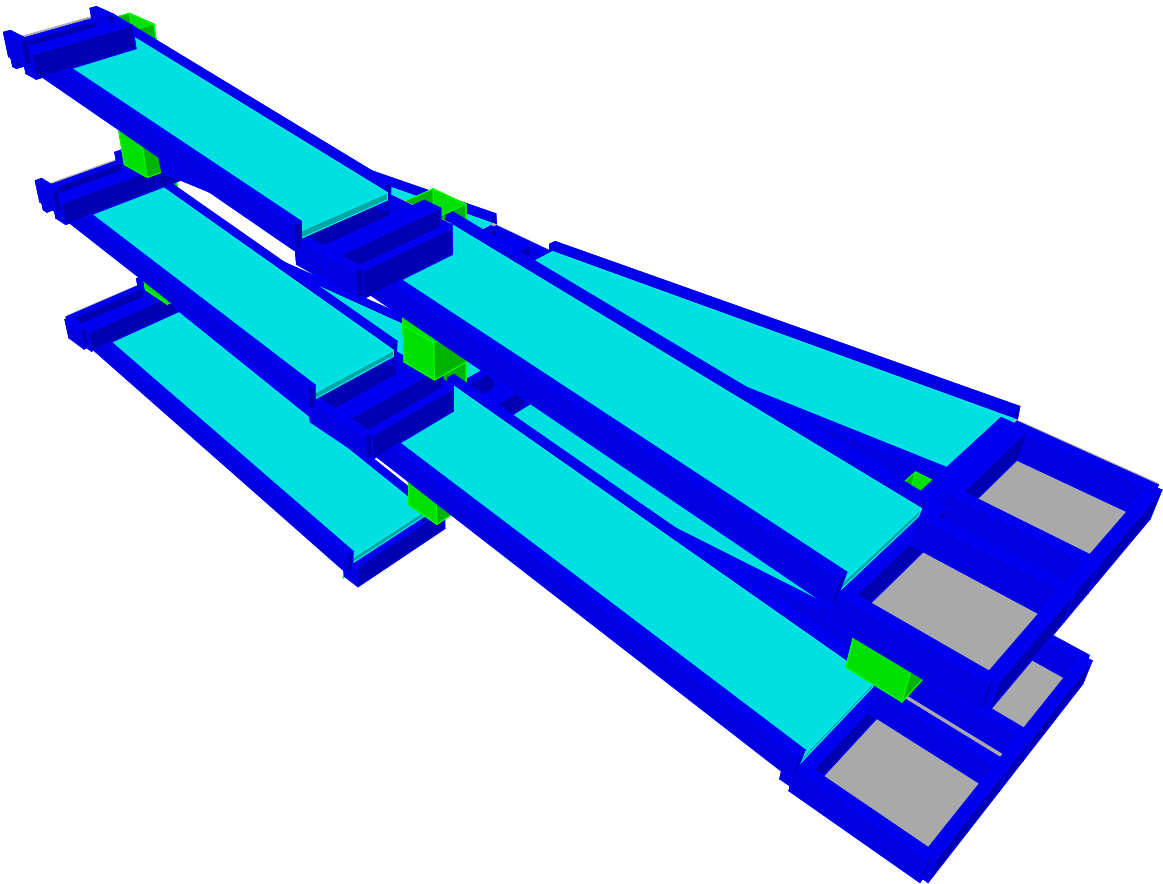
$$R = 10.87 \text{ kN}$$

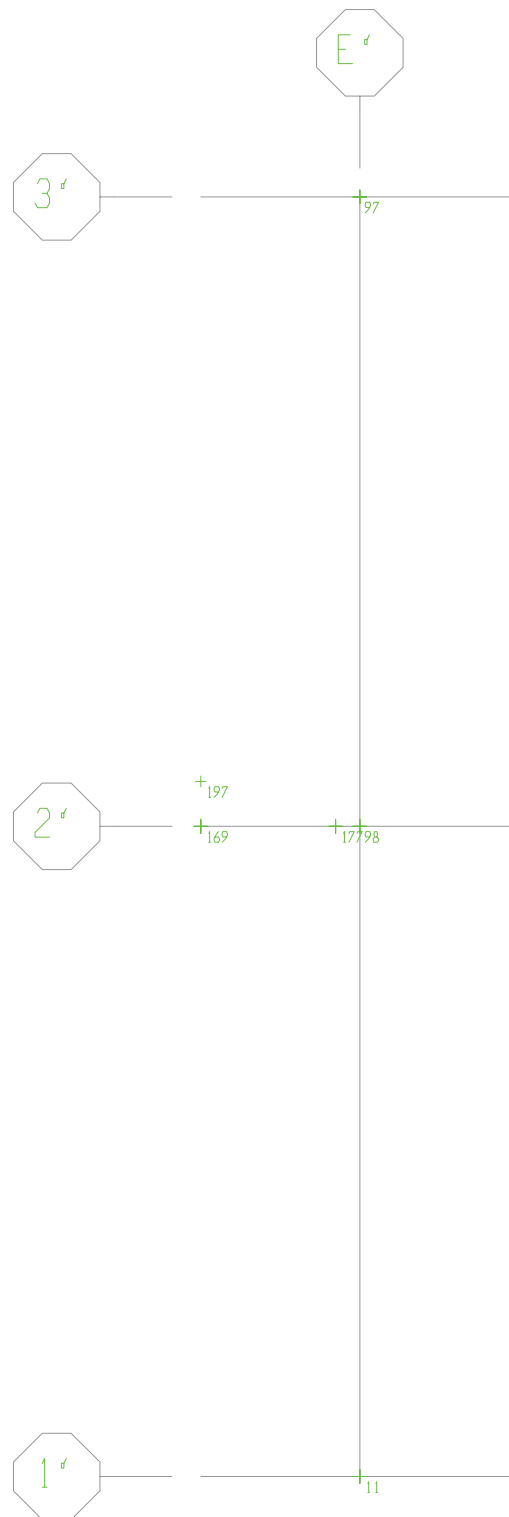
$$\phi_{vc} = 0.573 \text{ MPa}$$

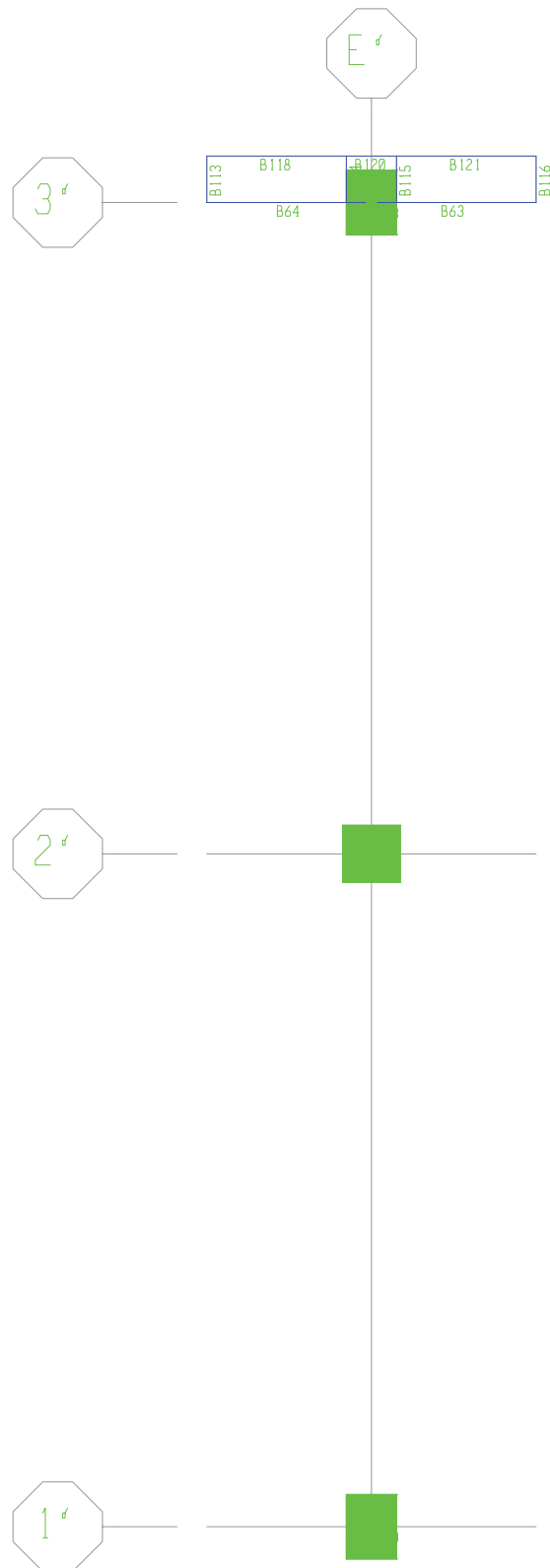
$$\phi_{vu} = 0.155 \text{ MPa} \quad \text{OK}$$

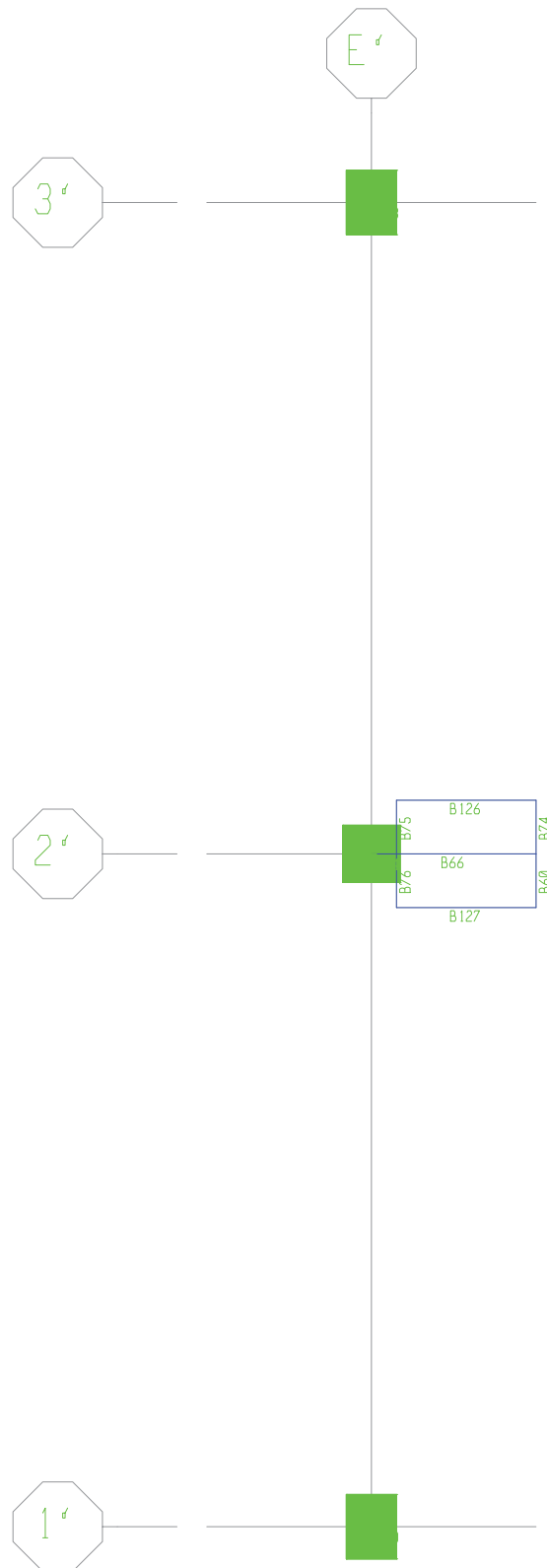
7. ANEXOS DEL COMPUTADOR

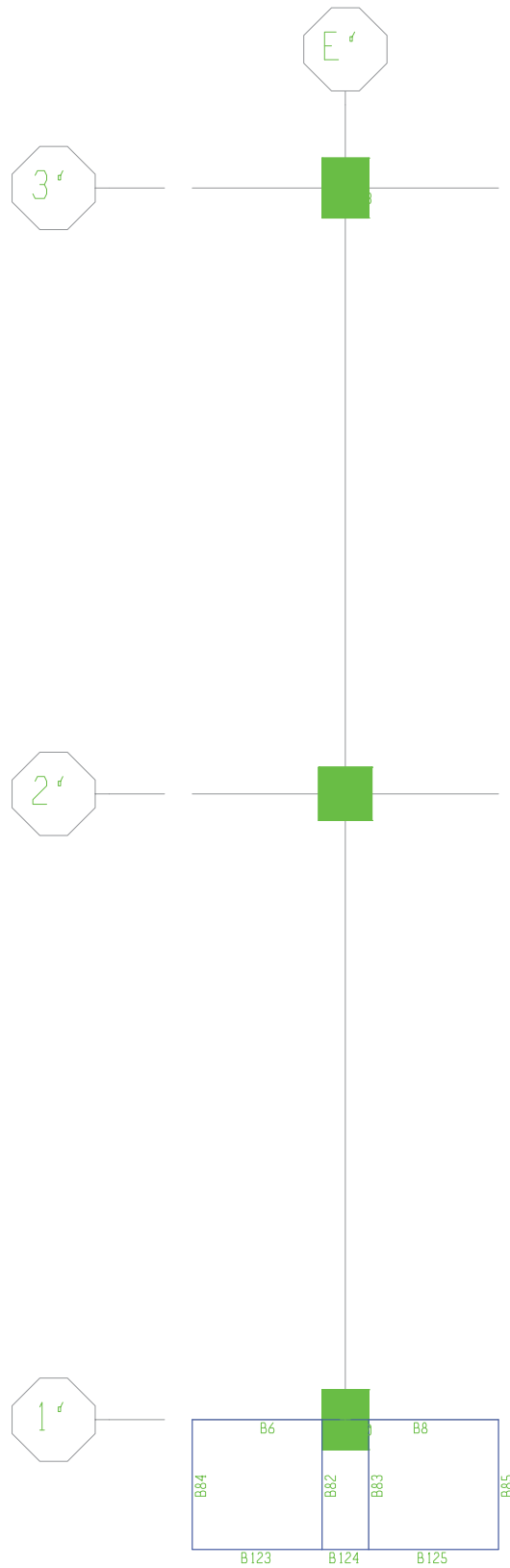
ANEXOS DEL COMPUTADOR



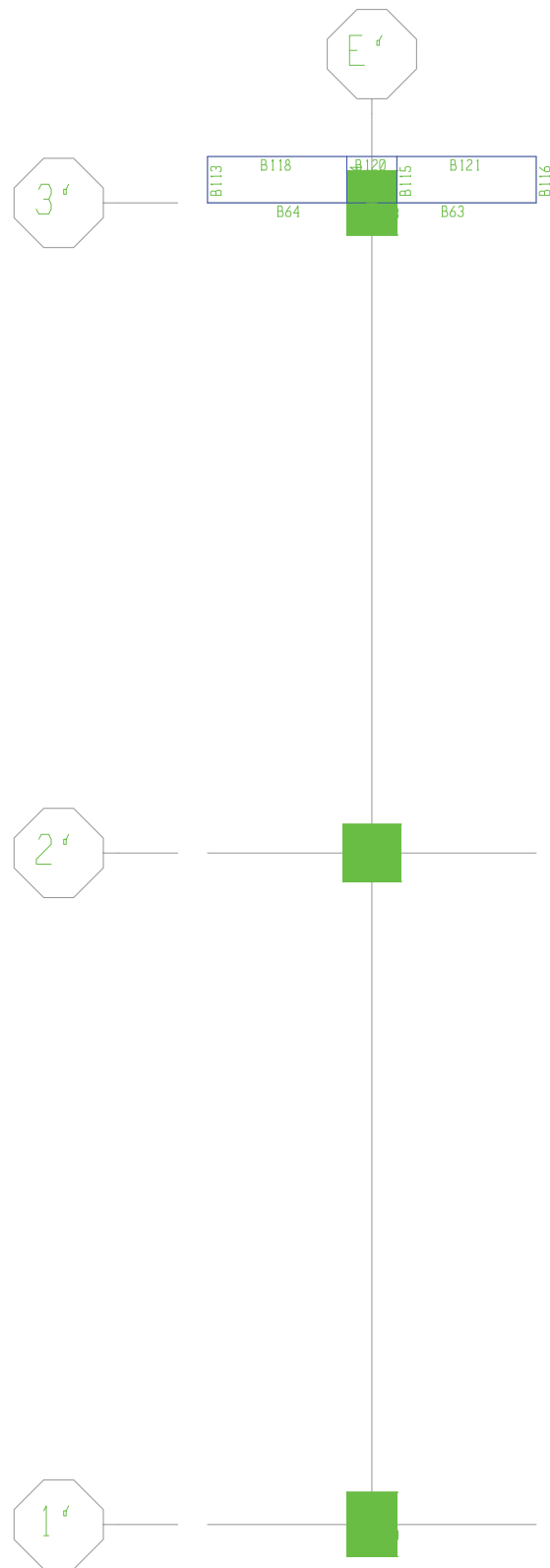


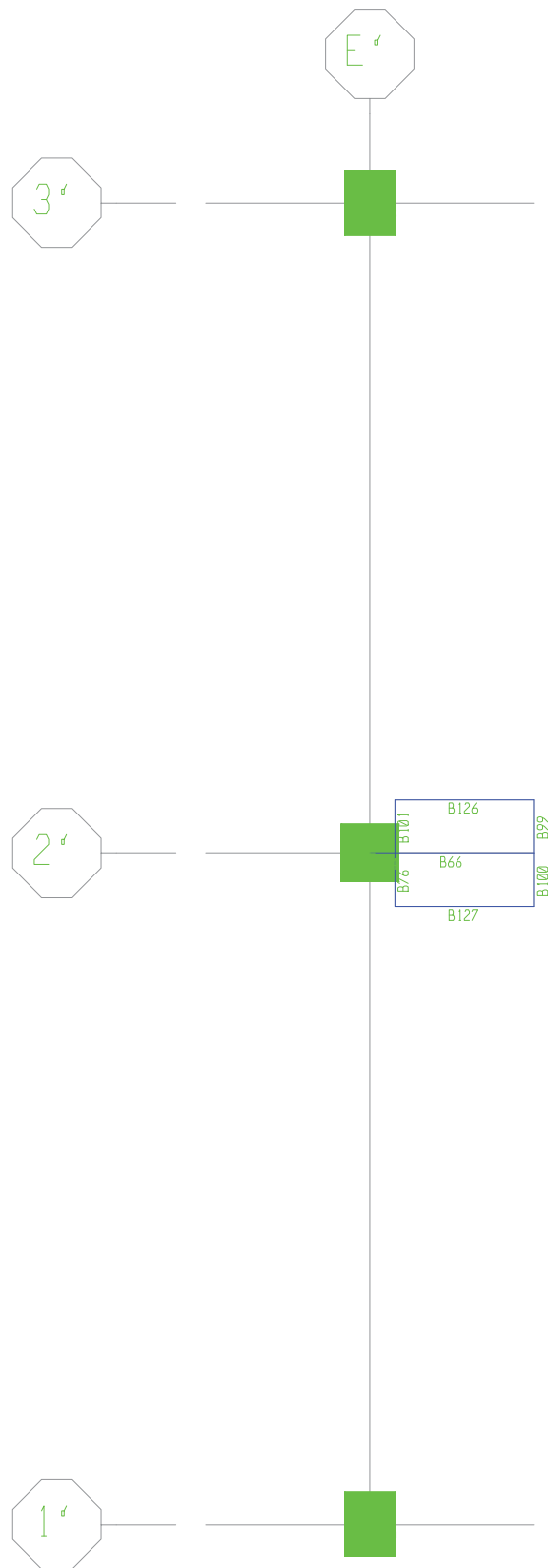


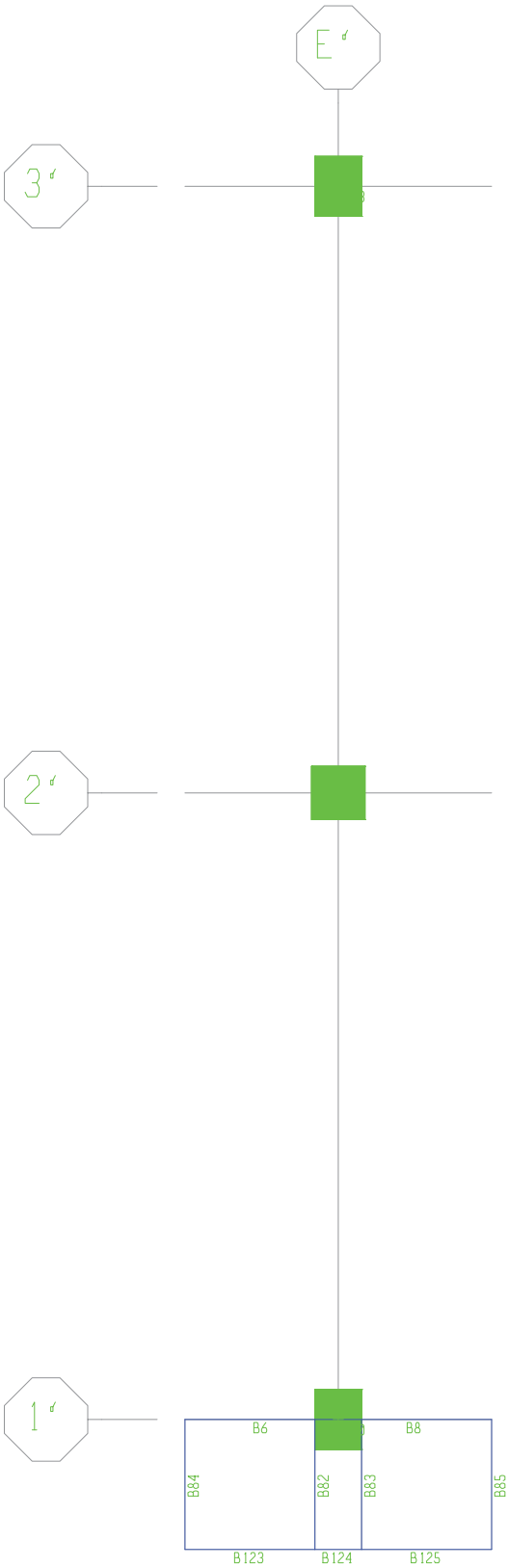


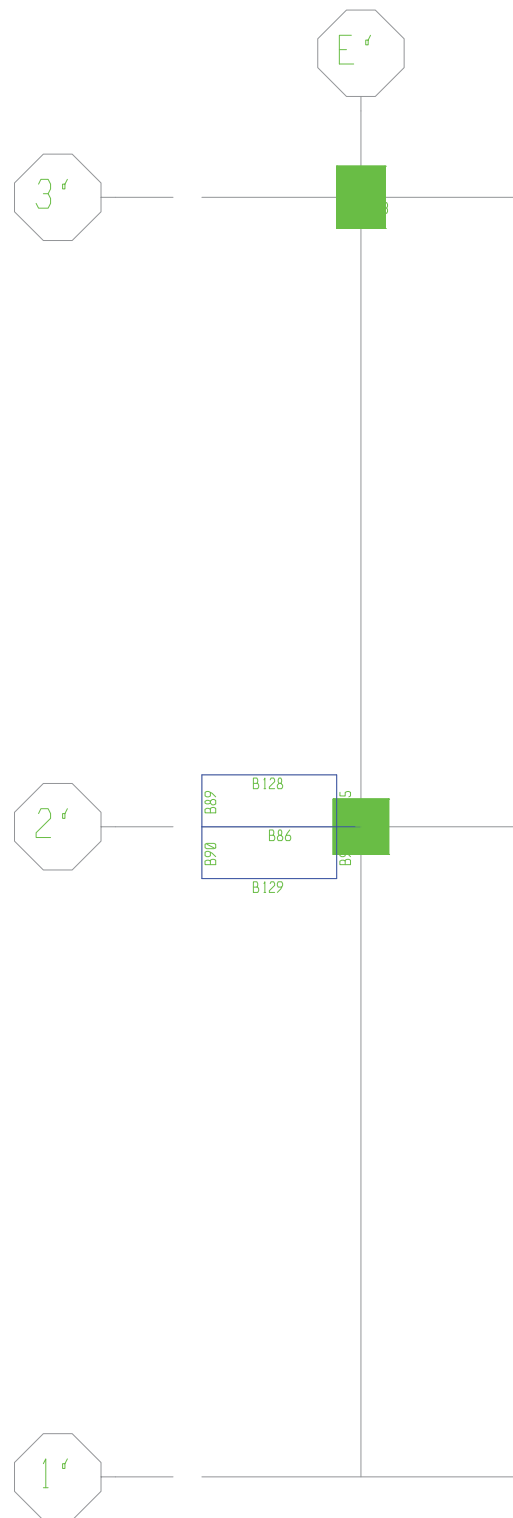


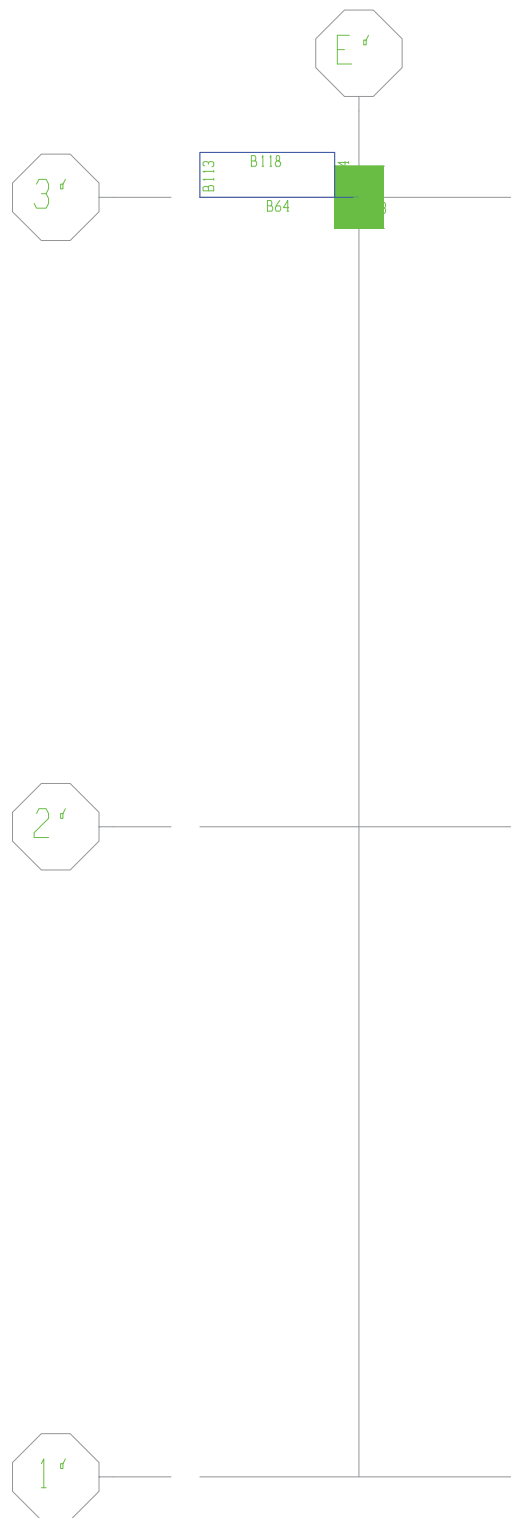












ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 1

S T O R Y D A T A

STORY	SIMILAR TO	HEIGHT	ELEVATION
N+6.00	None	0.813	7.530
N+5.187	None	0.813	6.718
N+4.37	None	0.813	5.905
N+3.56	N+2.75	0.812	5.093
N+2.75	None	0.812	4.280
N+1.937	None	0.824	3.468
N+1.12	N+6.00	0.813	2.644
N+0.31	N+6.00	0.805	1.831
N-0.5	N+6.00	1.026	1.026
BASE	None		0.000

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 2

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

POINT	X	Y	DZ-BELOW
10	0.000	0.000	0.000
11	2.300	0.000	0.000
14	4.600	0.000	0.000
97	2.300	18.500	0.000
98	2.300	9.400	0.000
109	4.600	9.400	0.000
110	4.600	10.150	0.000
111	4.600	8.650	0.000
118	2.650	9.400	0.000
119	2.650	10.150	0.000
120	2.650	8.650	0.000
121	4.600	18.500	0.000
122	0.000	18.500	0.000
134	0.000	-1.950	0.000
136	4.600	-1.950	0.000
137	1.950	0.000	0.000
138	1.950	-1.950	0.000
139	2.650	0.000	0.000
140	2.650	-1.950	0.000
169	0.000	9.400	0.000
170	0.000	10.150	0.000
172	0.000	8.650	0.000
177	1.950	9.400	0.000
178	1.950	10.150	0.000
179	1.950	8.650	0.000
189	2.650	18.500	0.000
194	1.950	18.500	0.000
197	0.000	10.050	0.000
198	0.000	19.150	0.000
200	4.600	19.150	0.000
202	1.950	19.150	0.000
203	2.650	19.150	0.000

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 3

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
C10	11	11	Below
C13	97	97	Below
C14	98	98	Below

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 4

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
B6	10	11
B8	11	14
B60	111	109

B63	97	121
B64	122	97
B66	98	109
B74	110	109
B75	119	118
B76	118	120
B82	137	138
B83	139	140
B84	10	134
B85	14	136
B86	169	98
B89	169	170
B90	169	172
B95	177	178
B96	177	179
B99	109	110
B100	109	111
B101	118	119
B113	122	198
B114	194	202
B115	189	203
B116	121	200
B118	198	202
B120	202	203
B121	203	200
B123	134	138
B124	138	140
B125	140	136
B126	119	110
B127	120	111
B128	170	178
B129	172	179

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 5

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
D25	110	121	Same
D27	189	119	Below
D28	14	111	Same
D29	139	120	Same
D33	179	137	Same
D34	10	172	Below
D37	170	122	Below
D38	178	194	Below
D41	111	14	Below
D42	120	139	Below
D46	177	194	Below
D52	169	122	Below

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 6

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
N+6.00	D1	122	198	194	202	
N+5.187	D1	169 179	170	172	177	178
N+4.37	D1	11 139	10 140	14 137	134 138	136
N+3.56	D1	109 120	110	111	118	119
N+2.75	D1	97 198	121 200	122 202	194 203	189
N+1.937	D1	98 178	169 179	170	172	177
N+1.12	D1	11	10	14	134	136

		137	138	139	140	
N+0.31	D1	109 120	110	111	119	118
N-0.5	D1	97 198	121 200	122 202	189 203	194

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 7

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	199947978.80	0.3000	1.1700E-05	76903068.77
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
RAMPA	Iso	Concrete	All	0.010	0.2000	9.9000E-06	0.004
CONC28	Iso	Concrete	All	21538110.000	0.2000	9.9000E-06	8974212.500

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
CONC28	2.4000E+00	2.4000E+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	344737.894	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
CONC28	No	28000.000	420000.000	420000.000	N/A

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 8

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
COL80X80	CONC28	Rectangular	Yes	
COL70X90	CONC28	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

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

VIG40X50	0.5000	0.4000	0.0000	0.0000	0.0000
0.0000					
COL80X80	0.8000	0.8000	0.0000	0.0000	0.0000
0.0000					
COL70X90	0.7000	0.9000	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

SHEAR AREAS FRAME SECTION NAME A3	SECTION	TORSIONAL	MOMENTS OF INERTIA		
	AREA	CONSTANT	I33	I22	A2
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					
COL80X80	0.6400	0.0577	0.0341	0.0341	0.5333
0.5333					
COL70X90	0.6300	0.0540	0.0257	0.0425	0.5250
0.5250					

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

GYRATION FRAME SECTION NAME R22	SECTION MODULI		PLASTIC MODULI		RADIUS OF
	S33	S22	Z33	Z22	R33
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					
COL80X80	0.0853	0.0853	0.1280	0.1280	0.2309
0.2309					
COL70X90	0.0735	0.0945	0.1103	0.1418	0.2021
0.2598					

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
VIG15X50	404.9750	40.4975
VIG40X50	154.5600	15.4560
COL80X80	103.1808	10.3181
COL70X90	203.1372	20.3137

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

BAR FRAME SECTION NAME COVER	REINF CONFIGURATION		REINF	NUM BARS	NUM BARS
	LONGIT	LATERAL	SIZE/TYPE	3DIR/2DIR	CIRCULAR
COL80X80	Rectangular Ties		#8/Design	8/8	N/A
0.0500					
COL70X90	Rectangular Ties		#8/Design	9/7	N/A
0.0500					

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

BOT RIGHT FRAME SECTION NAME AREA	TOP	BOT	TOP LEFT	TOP RIGHT	BOT LEFT
	COVER	COVER	AREA	AREA	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					

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 9

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 RAMPA	CONC21 RAMPA	Membrane Membrane	No No	0.1420 0.1420	0.1420 0.1420	125.7126 0.0000	12.5713 51.4822

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 10

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		

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 11

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	15.5170
U2	----	N/A
UZ	----	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	15.2670
UZ	----	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	15.5170
U2	----	N/A
UZ	----	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	15.2670
UZ	----	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	15.8170
U2	----	N/A
UZ	----	N/A

RESP SPEC CASE: SISUMBY

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	18.3180
UZ	----	N/A

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 12

LOADING COMBINATIONS

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	0.3000
		SISDISX	Spectra	1.0000
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	0.5250
		SISDISY	Spectra	0.1575
CIM3	ADD	DEAD	Static	1.0000
		LIVE	Static	0.7500
		SISDISY	Spectra	0.1575
		SISDISX	Spectra	0.5250
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

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 13

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\dye\desktop\proyectos ingeniero carlos\ie del sur\modelo rampa\derivass
general.txt

DATA TYPE: Period vs Acceleration

NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	1.1250
0.0500	1.1250
0.1000	1.1250
0.1600	1.1250
0.2100	1.1250
0.4100	1.1250
0.6000	1.1250
0.8000	1.1250
1.0000	1.1250
1.3400	0.8370
1.6900	0.6660
2.0300	0.5530
2.3800	0.4730
2.7200	0.4130
3.0700	0.3670
3.4100	0.3300
3.7600	0.3000
4.1000	0.2740
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\dye\desktop\proyectos ingeniero carlos\ie del sur\modelo rampa\diseño
general.txt
DATA TYPE: Period vs Acceleration
NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	0.7500
0.0500	0.7500
0.1000	0.7500
0.1600	0.7500
0.2100	0.7500
0.4100	0.7500
0.6000	0.7500
0.8000	0.7500
1.0000	0.7500
1.3400	0.5580
1.6900	0.4440
2.0300	0.3690
2.3800	0.3150
2.7200	0.2760
3.0700	0.2450
3.4100	0.2200
3.7600	0.2000
4.1000	0.1830
4.4400	0.1690
4.7900	0.1570
5.1300	0.1460
5.4800	0.1370
5.8200	0.1290
6.1700	0.1220
6.5100	0.1150
6.8600	0.1090
7.2000	0.1040
8.2000	0.0800
9.2000	0.0640

FUNCTION NAME: UMBRAL

FILE NAME: c:\users\dye\desktop\proyectos ingeniero carlos\ie del sur\modelo rampa\umbral
diseño.txt
DATA TYPE: Period vs Acceleration
NUMBER OF HEADER LINES = 0

PERIOD	ACCEL
0.0000	0.0800
0.0500	0.1120
0.1000	0.1440
0.1500	0.1760
0.2000	0.2080
0.2500	0.2400
0.4900	0.2400
0.7300	0.2400
0.9800	0.2400
1.2200	0.2400
1.4600	0.2400
1.7000	0.2400
1.9500	0.2400
2.1900	0.2400
2.7800	0.1890
3.3800	0.1560
3.9700	0.1320
4.5600	0.1150
5.1600	0.1020
5.7500	0.0910
6.3400	0.0830

6.9400	0.0760
7.5300	0.0700
8.1300	0.0650
8.7200	0.0600
9.3100	0.0560
9.9100	0.0530
10.5000	0.0500
11.5000	0.0420
12.5000	0.0350

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 14

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 DESIGN LEVEL SECTION	LINE ID	LINE TYPE	SECTION TYPE	AUTO SELECT SECTION	ANALYSIS SECTION	DESIGN PROCEDURE
N+6.00 COL70X90	C13	Column	Rectangular	None	COL70X90	Conc Frame
N+5.187 COL70X90	C13	Column	Rectangular	None	COL70X90	Conc Frame
N+5.187 COL80X80	C14	Column	Rectangular	None	COL80X80	Conc Frame
N+4.37 COL70X90	C10	Column	Rectangular	None	COL70X90	Conc Frame
N+4.37 COL70X90	C13	Column	Rectangular	None	COL70X90	Conc Frame
N+4.37 COL80X80	C14	Column	Rectangular	None	COL80X80	Conc Frame
N+3.56 COL70X90	C10	Column	Rectangular	None	COL70X90	Conc Frame
N+3.56 COL70X90	C13	Column	Rectangular	None	COL70X90	Conc Frame
N+3.56 COL80X80	C14	Column	Rectangular	None	COL80X80	Conc Frame
N+2.75 COL70X90	C10	Column	Rectangular	None	COL70X90	Conc Frame
N+2.75 COL70X90	C13	Column	Rectangular	None	COL70X90	Conc Frame
N+2.75 COL80X80	C14	Column	Rectangular	None	COL80X80	Conc Frame
N+1.937 COL70X90	C10	Column	Rectangular	None	COL70X90	Conc Frame
N+1.937 COL70X90	C13	Column	Rectangular	None	COL70X90	Conc Frame
N+1.937 COL80X80	C14	Column	Rectangular	None	COL80X80	Conc Frame
N+1.12 COL70X90	C10	Column	Rectangular	None	COL70X90	Conc Frame
N+1.12 COL70X90	C13	Column	Rectangular	None	COL70X90	Conc Frame
N+1.12 COL80X80	C14	Column	Rectangular	None	COL80X80	Conc Frame
N+0.31 COL70X90	C10	Column	Rectangular	None	COL70X90	Conc Frame
N+0.31 COL70X90	C13	Column	Rectangular	None	COL70X90	Conc Frame
N+0.31 COL80X80	C14	Column	Rectangular	None	COL80X80	Conc Frame
N-0.5 COL70X90	C10	Column	Rectangular	None	COL70X90	Conc Frame
N-0.5 COL70X90	C13	Column	Rectangular	None	COL70X90	Conc Frame
N-0.5 COL80X80	C14	Column	Rectangular	None	COL80X80	Conc Frame
N+6.00 VIG40X50	B64	Beam	Rectangular	None	VIG40X50	Conc Frame
N+6.00 VIG15X50	B113	Beam	Rectangular	None	VIG15X50	Conc Frame
N+6.00 VIG15X50	B114	Beam	Rectangular	None	VIG15X50	Conc Frame
N+6.00 VIG15X50	B118	Beam	Rectangular	None	VIG15X50	Conc Frame

N+5.187 VIG40X50	B86	Beam	Rectangular	None	VIG40X50	Conc Frame
N+5.187 VIG15X50	B89	Beam	Rectangular	None	VIG15X50	Conc Frame
N+5.187 VIG15X50	B90	Beam	Rectangular	None	VIG15X50	Conc Frame
N+5.187 VIG15X50	B95	Beam	Rectangular	None	VIG15X50	Conc Frame
N+5.187 VIG15X50	B96	Beam	Rectangular	None	VIG15X50	Conc Frame
N+5.187 VIG15X50	B128	Beam	Rectangular	None	VIG15X50	Conc Frame
N+5.187 VIG15X50	B129	Beam	Rectangular	None	VIG15X50	Conc Frame
N+4.37 VIG40X50	B6	Beam	Rectangular	None	VIG40X50	Conc Frame
N+4.37 VIG40X50	B8	Beam	Rectangular	None	VIG40X50	Conc Frame
N+4.37 VIG15X50	B82	Beam	Rectangular	None	VIG15X50	Conc Frame
N+4.37 VIG15X50	B83	Beam	Rectangular	None	VIG15X50	Conc Frame
N+4.37 VIG15X50	B84	Beam	Rectangular	None	VIG15X50	Conc Frame
N+4.37 VIG15X50	B85	Beam	Rectangular	None	VIG15X50	Conc Frame
N+4.37 VIG15X50	B123	Beam	Rectangular	None	VIG15X50	Conc Frame
N+4.37 VIG15X50	B124	Beam	Rectangular	None	VIG15X50	Conc Frame
N+4.37 VIG15X50	B125	Beam	Rectangular	None	VIG15X50	Conc Frame
N+3.56 VIG40X50	B66	Beam	Rectangular	None	VIG40X50	Conc Frame
N+3.56 VIG15X50	B76	Beam	Rectangular	None	VIG15X50	Conc Frame
N+3.56 VIG15X50	B99	Beam	Rectangular	None	VIG15X50	Conc Frame
N+3.56 VIG15X50	B100	Beam	Rectangular	None	VIG15X50	Conc Frame
N+3.56 VIG15X50	B101	Beam	Rectangular	None	VIG15X50	Conc Frame
N+3.56 VIG15X50	B126	Beam	Rectangular	None	VIG15X50	Conc Frame
N+3.56 VIG15X50	B127	Beam	Rectangular	None	VIG15X50	Conc Frame
N+2.75 VIG40X50	B63	Beam	Rectangular	None	VIG40X50	Conc Frame
N+2.75 VIG40X50	B64	Beam	Rectangular	None	VIG40X50	Conc Frame
N+2.75 VIG15X50	B113	Beam	Rectangular	None	VIG15X50	Conc Frame
N+2.75 VIG15X50	B114	Beam	Rectangular	None	VIG15X50	Conc Frame
N+2.75 VIG15X50	B115	Beam	Rectangular	None	VIG15X50	Conc Frame
N+2.75 VIG15X50	B116	Beam	Rectangular	None	VIG15X50	Conc Frame
N+2.75 VIG15X50	B118	Beam	Rectangular	None	VIG15X50	Conc Frame
N+2.75 VIG15X50	B120	Beam	Rectangular	None	VIG15X50	Conc Frame
N+2.75 VIG15X50	B121	Beam	Rectangular	None	VIG15X50	Conc Frame
N+1.937 VIG40X50	B86	Beam	Rectangular	None	VIG40X50	Conc Frame
N+1.937 VIG15X50	B89	Beam	Rectangular	None	VIG15X50	Conc Frame
N+1.937 VIG15X50	B90	Beam	Rectangular	None	VIG15X50	Conc Frame
N+1.937 VIG15X50	B95	Beam	Rectangular	None	VIG15X50	Conc Frame
N+1.937 VIG15X50	B96	Beam	Rectangular	None	VIG15X50	Conc Frame
N+1.937 VIG15X50	B128	Beam	Rectangular	None	VIG15X50	Conc Frame

N+1.937 VIG15X50	B129	Beam	Rectangular	None	VIG15X50	Conc Frame
N+1.12 VIG40X50	B6	Beam	Rectangular	None	VIG40X50	Conc Frame
N+1.12 VIG40X50	B8	Beam	Rectangular	None	VIG40X50	Conc Frame
N+1.12 VIG15X50	B82	Beam	Rectangular	None	VIG15X50	Conc Frame
N+1.12 VIG15X50	B83	Beam	Rectangular	None	VIG15X50	Conc Frame
N+1.12 VIG15X50	B84	Beam	Rectangular	None	VIG15X50	Conc Frame
N+1.12 VIG15X50	B85	Beam	Rectangular	None	VIG15X50	Conc Frame
N+1.12 VIG15X50	B123	Beam	Rectangular	None	VIG15X50	Conc Frame
N+1.12 VIG15X50	B124	Beam	Rectangular	None	VIG15X50	Conc Frame
N+1.12 VIG15X50	B125	Beam	Rectangular	None	VIG15X50	Conc Frame
N+0.31 VIG15X50	B60	Beam	Rectangular	None	VIG15X50	Conc Frame
N+0.31 VIG40X50	B66	Beam	Rectangular	None	VIG40X50	Conc Frame
N+0.31 VIG15X50	B74	Beam	Rectangular	None	VIG15X50	Conc Frame
N+0.31 VIG15X50	B75	Beam	Rectangular	None	VIG15X50	Conc Frame
N+0.31 VIG15X50	B76	Beam	Rectangular	None	VIG15X50	Conc Frame
N+0.31 VIG15X50	B126	Beam	Rectangular	None	VIG15X50	Conc Frame
N+0.31 VIG15X50	B127	Beam	Rectangular	None	VIG15X50	Conc Frame
N-0.5 VIG40X50	B63	Beam	Rectangular	None	VIG40X50	Conc Frame
N-0.5 VIG40X50	B64	Beam	Rectangular	None	VIG40X50	Conc Frame
N-0.5 VIG15X50	B113	Beam	Rectangular	None	VIG15X50	Conc Frame
N-0.5 VIG15X50	B114	Beam	Rectangular	None	VIG15X50	Conc Frame
N-0.5 VIG15X50	B115	Beam	Rectangular	None	VIG15X50	Conc Frame
N-0.5 VIG15X50	B116	Beam	Rectangular	None	VIG15X50	Conc Frame
N-0.5 VIG15X50	B118	Beam	Rectangular	None	VIG15X50	Conc Frame
N-0.5 VIG15X50	B120	Beam	Rectangular	None	VIG15X50	Conc Frame
N-0.5 VIG15X50	B121	Beam	Rectangular	None	VIG15X50	Conc Frame
BASE VIG40X50	B86	Beam	Rectangular	None	VIG40X50	Conc Frame
N+6.00 VIG15X50	D37	Brace	Rectangular	None	VIG15X50	Conc Frame
N+6.00 VIG15X50	D38	Brace	Rectangular	None	VIG15X50	Conc Frame
N+5.187 VIG15X50	D33	Brace	Rectangular	None	VIG15X50	Conc Frame
N+5.187 VIG15X50	D34	Brace	Rectangular	None	VIG15X50	Conc Frame
N+4.37 VIG15X50	D41	Brace	Rectangular	None	VIG15X50	Conc Frame
N+4.37 VIG15X50	D42	Brace	Rectangular	None	VIG15X50	Conc Frame
N+3.56 VIG15X50	D25	Brace	Rectangular	None	VIG15X50	Conc Frame
N+3.56 VIG15X50	D27	Brace	Rectangular	None	VIG15X50	Conc Frame
N+2.75 VIG15X50	D37	Brace	Rectangular	None	VIG15X50	Conc Frame
N+2.75 VIG15X50	D38	Brace	Rectangular	None	VIG15X50	Conc Frame
N+1.937 VIG15X50	D33	Brace	Rectangular	None	VIG15X50	Conc Frame

N+1.937 VIG15X50	D34	Brace	Rectangular	None	VIG15X50	Conc Frame
N+1.12 VIG15X50	D28	Brace	Rectangular	None	VIG15X50	Conc Frame
N+1.12 VIG15X50	D29	Brace	Rectangular	None	VIG15X50	Conc Frame
N+0.31 VIG15X50	D25	Brace	Rectangular	None	VIG15X50	Conc Frame
N+0.31 VIG15X50	D27	Brace	Rectangular	None	VIG15X50	Conc Frame
N-0.5 VIG15X50	D46	Brace	Rectangular	None	VIG15X50	Conc Frame
N-0.5 VIG15X50	D52	Brace	Rectangular	None	VIG15X50	Conc Frame

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 15

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 LOAD B CASE PER LENGTH	STORY LEVEL	LINE ID	LOAD TYPE	LOAD DIRECTION	ABSOLUTE DISTANCE A	ABSOLUTE DISTANCE B	LOAD A PER LENGTH
DEAD	N+6.00	D37	Force	Gravity	0.000	8.389	3.400
3.400							
DEAD	N+6.00	D38	Force	Gravity	0.000	8.389	3.400
3.400							
DEAD	N+5.187	D33	Force	Gravity	0.000	8.688	3.400
3.400							
DEAD	N+5.187	D34	Force	Gravity	0.000	8.688	3.400
3.400							
DEAD	N+4.37	D41	Force	Gravity	0.000	8.688	3.400
3.400							
DEAD	N+4.37	D42	Force	Gravity	0.000	8.688	3.400
3.400							
DEAD	N+3.56	D25	Force	Gravity	0.000	8.389	3.400
3.400							
DEAD	N+3.56	D27	Force	Gravity	0.000	8.389	3.400
3.400							
DEAD	N+2.75	D37	Force	Gravity	0.000	8.389	3.400
3.400							
DEAD	N+2.75	D38	Force	Gravity	0.000	8.389	3.400
3.400							
DEAD	N+1.937	D33	Force	Gravity	0.000	8.689	3.400
3.400							
DEAD	N+1.937	D34	Force	Gravity	0.000	8.689	3.400
3.400							
DEAD	N+1.12	D28	Force	Gravity	0.000	8.688	3.400
3.400							
DEAD	N+1.12	D29	Force	Gravity	0.000	8.688	3.400
3.400							
DEAD	N+0.31	D25	Force	Gravity	0.000	8.389	3.400
3.400							
DEAD	N+0.31	D27	Force	Gravity	0.000	8.389	3.400
3.400							
DEAD	N-0.5	D46	Force	Gravity	0.000	9.158	3.400
3.400							
DEAD	N-0.5	D52	Force	Gravity	0.000	9.158	3.400
3.400							
LIVE	N+6.00	D37	Force	Gravity	0.000	8.389	5.000
5.000							
LIVE	N+6.00	D38	Force	Gravity	0.000	8.389	5.000
5.000							
LIVE	N+5.187	D33	Force	Gravity	0.000	8.688	5.000
5.000							
LIVE	N+5.187	D34	Force	Gravity	0.000	8.688	5.000
5.000							
LIVE	N+4.37	D41	Force	Gravity	0.000	8.688	5.000
5.000							
LIVE	N+4.37	D42	Force	Gravity	0.000	8.688	5.000
5.000							
LIVE	N+3.56	D25	Force	Gravity	0.000	8.389	5.000
5.000							
LIVE	N+3.56	D27	Force	Gravity	0.000	8.389	5.000
5.000							

LIVE	N+2.75	D37	Force	Gravity	0.000	8.389	5.000
5.000							
LIVE	N+2.75	D38	Force	Gravity	0.000	8.389	5.000
5.000							
LIVE	N+1.937	D33	Force	Gravity	0.000	8.689	5.000
5.000							
LIVE	N+1.937	D34	Force	Gravity	0.000	8.689	5.000
5.000							
LIVE	N+1.12	D28	Force	Gravity	0.000	8.688	5.000
5.000							
LIVE	N+1.12	D29	Force	Gravity	0.000	8.688	5.000
5.000							
LIVE	N+0.31	D25	Force	Gravity	0.000	8.389	5.000
5.000							
LIVE	N+0.31	D27	Force	Gravity	0.000	8.389	5.000
5.000							
LIVE	N-0.5	D46	Force	Gravity	0.000	9.158	5.000
5.000							
LIVE	N-0.5	D52	Force	Gravity	0.000	9.158	5.000
5.000							

ETABS v9.7.4 File:RAMPA Units:KN-m octubre 7, 2016 7:40 PAGE 16

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+6.00	F72	Floor	Gravity	5.0000
LIVE	N+5.187	F61	Floor	Gravity	5.0000
LIVE	N+5.187	F62	Floor	Gravity	5.0000
LIVE	N+4.37	F65	Floor	Gravity	5.0000
LIVE	N+4.37	F68	Floor	Gravity	5.0000
LIVE	N+4.37	F69	Floor	Gravity	5.0000
LIVE	N+3.56	F63	Floor	Gravity	5.0000
LIVE	N+3.56	F64	Floor	Gravity	5.0000
LIVE	N+2.75	F72	Floor	Gravity	5.0000
LIVE	N+2.75	F75	Floor	Gravity	5.0000
LIVE	N+2.75	F76	Floor	Gravity	5.0000
LIVE	N+1.937	F61	Floor	Gravity	5.0000
LIVE	N+1.937	F62	Floor	Gravity	5.0000
LIVE	N+1.12	F55	Floor	Gravity	5.0000
LIVE	N+1.12	F60	Floor	Gravity	5.0000
LIVE	N+1.12	F69	Floor	Gravity	5.0000
LIVE	N+0.31	F44	Floor	Gravity	5.0000
LIVE	N+0.31	F45	Floor	Gravity	5.0000
LIVE	N-0.5	F72	Floor	Gravity	5.0000
LIVE	N-0.5	F73	Floor	Gravity	5.0000
LIVE	N-0.5	F74	Floor	Gravity	5.0000



PROYECTO: I. E. EL SUR (IPIALES) - RAMPA

FUERZAS EN VIGAS

BEAM FORCES

UNID: kN-m

Story	Beam	Load	Loc	P	V2	V3	T	M2	M3
N+4.37	B6	ENVOLVENTE MAX	0	0	86.51	0	57.173	0	6.051
N+4.37	B6	ENVOLVENTE MAX	1.15	0	100.76	0	57.173	0	-20.788
N+4.37	B6	ENVOLVENTE MAX	1.95	0	109.24	0	57.173	0	-42.201
N+4.37	B6	ENVOLVENTE MAX	1.95	0	212.92	0	111.862	0	-39.926
N+4.37	B6	ENVOLVENTE MAX	2.3	0	215.68	0	111.862	0	-58.87
N+4.37	B6	ENVOLVENTE MIN	0	0	16.28	0	-4.296	0	-1.452
N+4.37	B6	ENVOLVENTE MIN	1.15	0	23.18	0	-4.296	0	-102.302
N+4.37	B6	ENVOLVENTE MIN	1.95	0	27.62	0	-4.296	0	-186.817
N+4.37	B6	ENVOLVENTE MIN	1.95	0	43.35	0	-30.058	0	-187.019
N+4.37	B6	ENVOLVENTE MIN	2.3	0	45.05	0	-30.058	0	-261.98
N+1.12	B6	ENVOLVENTE MAX	0	0	85.6	0	53.583	0	5.421
N+1.12	B6	ENVOLVENTE MAX	1.15	0	99.85	0	53.583	0	-19.207
N+1.12	B6	ENVOLVENTE MAX	1.95	0	108.33	0	53.583	0	-39.248
N+1.12	B6	ENVOLVENTE MAX	1.95	0	208.76	0	109.633	0	-37.302
N+1.12	B6	ENVOLVENTE MAX	2.3	0	211.52	0	109.633	0	-55.24
N+1.12	B6	ENVOLVENTE MIN	0	0	15.76	0	-1.356	0	-0.445
N+1.12	B6	ENVOLVENTE MIN	1.15	0	22.66	0	-1.356	0	-100.924
N+1.12	B6	ENVOLVENTE MIN	1.95	0	27.1	0	-1.356	0	-184.709
N+1.12	B6	ENVOLVENTE MIN	1.95	0	37.23	0	-20.637	0	-184.54
N+1.12	B6	ENVOLVENTE MIN	2.3	0	38.93	0	-20.637	0	-258.045
N+4.37	B8	ENVOLVENTE MAX	0	0	-34.93	0	34.678	0	-60.969
N+4.37	B8	ENVOLVENTE MAX	0.35	0	-33.23	0	34.678	0	-39.316
N+4.37	B8	ENVOLVENTE MAX	0.35	0	-28.06	0	7.243	0	-41.096
N+4.37	B8	ENVOLVENTE MAX	1.15	0	-23.63	0	7.243	0	-20.271
N+4.37	B8	ENVOLVENTE MAX	2.3	0	-16.72	0	7.243	0	4.841
N+4.37	B8	ENVOLVENTE MIN	0	0	-205.94	0	-108.891	0	-246.888
N+4.37	B8	ENVOLVENTE MIN	0.35	0	-203.18	0	-108.891	0	-175.335
N+4.37	B8	ENVOLVENTE MIN	0.35	0	-103.93	0	-54.13	0	-175.944
N+4.37	B8	ENVOLVENTE MIN	1.15	0	-95.45	0	-54.13	0	-95.676
N+4.37	B8	ENVOLVENTE MIN	2.3	0	-81.2	0	-54.13	0	0.166
N+1.12	B8	ENVOLVENTE MAX	0	0	-49.22	0	20.562	0	-68.027
N+1.12	B8	ENVOLVENTE MAX	0.35	0	-47.52	0	20.562	0	-44.672
N+1.12	B8	ENVOLVENTE MAX	0.35	0	-30.28	0	1.488	0	-45.854
N+1.12	B8	ENVOLVENTE MAX	1.15	0	-25.84	0	1.488	0	-23.267
N+1.12	B8	ENVOLVENTE MAX	2.3	0	-18.94	0	1.488	0	4.499
N+1.12	B8	ENVOLVENTE MIN	0	0	-211.04	0	-101.689	0	-253.311
N+1.12	B8	ENVOLVENTE MIN	0.35	0	-208.28	0	-101.689	0	-179.975
N+1.12	B8	ENVOLVENTE MIN	0.35	0	-106.17	0	-48.614	0	-180.386
N+1.12	B8	ENVOLVENTE MIN	1.15	0	-97.7	0	-48.614	0	-98.321
N+1.12	B8	ENVOLVENTE MIN	2.3	0	-83.45	0	-48.614	0	0.598
N+0.31	B60	ENVOLVENTE MAX	0	0	63.27	0	3.681	0	-5.193
N+0.31	B60	ENVOLVENTE MAX	0.375	0	64.93	0	3.681	0	-14.696
N+0.31	B60	ENVOLVENTE MAX	0.75	0	66.59	0	3.681	0	-21.114
N+0.31	B60	ENVOLVENTE MIN	0	0	10.73	0	0.368	0	-65.432
N+0.31	B60	ENVOLVENTE MIN	0.375	0	11.56	0	0.368	0	-89.415
N+0.31	B60	ENVOLVENTE MIN	0.75	0	12.38	0	0.368	0	-114.126
N+2.75	B63	ENVOLVENTE MAX	0	0	-17.89	0	131.098	0	-42.207
N+2.75	B63	ENVOLVENTE MAX	0.35	0	-16.19	0	131.098	0	-29.9
N+2.75	B63	ENVOLVENTE MAX	0.35	0	-22.03	0	59.552	0	-31.306
N+2.75	B63	ENVOLVENTE MAX	1.15	0	-17.94	0	59.552	0	-15.254
N+2.75	B63	ENVOLVENTE MAX	2.3	0	-11.99	0	59.552	0	4.778
N+2.75	B63	ENVOLVENTE MIN	0	0	-163.74	0	-12.034	0	-185.049
N+2.75	B63	ENVOLVENTE MIN	0.35	0	-160.99	0	-12.034	0	-128.264
N+2.75	B63	ENVOLVENTE MIN	0.35	0	-77.08	0	-0.174	0	-128.784
N+2.75	B63	ENVOLVENTE MIN	1.15	0	-69.96	0	-0.174	0	-69.782
N+2.75	B63	ENVOLVENTE MIN	2.3	0	-59.46	0	-0.174	0	-0.205
N-0.5	B63	ENVOLVENTE MAX	0	0	-36.13	0	134.603	0	-41.938
N-0.5	B63	ENVOLVENTE MAX	0.35	0	-34.43	0	134.603	0	-25.563
N-0.5	B63	ENVOLVENTE MAX	0.35	0	-19.13	0	56.708	0	-26.399
N-0.5	B63	ENVOLVENTE MAX	1.15	0	-15.04	0	56.708	0	-12.675
N-0.5	B63	ENVOLVENTE MAX	2.3	0	-9.08	0	56.708	0	4.519
N-0.5	B63	ENVOLVENTE MIN	0	0	-161.92	0	14.084	0	-184.843
N-0.5	B63	ENVOLVENTE MIN	0.35	0	-159.17	0	14.084	0	-128.693
N-0.5	B63	ENVOLVENTE MIN	0.35	0	-77.33	0	8.384	0	-129.102
N-0.5	B63	ENVOLVENTE MIN	1.15	0	-70.22	0	8.384	0	-69.895
N-0.5	B63	ENVOLVENTE MIN	2.3	0	-59.72	0	8.384	0	0.58
N+6.00	B64	ENVOLVENTE MAX	0	0	67.58	0	3.864	0	5.417
N+6.00	B64	ENVOLVENTE MAX	1.15	0	78.08	0	3.864	0	-21.46
N+6.00	B64	ENVOLVENTE MAX	1.95	0	85.2	0	3.864	0	-41.901
N+6.00	B64	ENVOLVENTE MAX	1.95	132.08	148.33	82.17	13.192	159.841	-42.408
N+6.00	B64	ENVOLVENTE MAX	2.3	132.08	150.35	82.17	13.192	153.466	-59.009
N+6.00	B64	ENVOLVENTE MIN	0	0	17.49	0	-53.178	0	0.822
N+6.00	B64	ENVOLVENTE MIN	1.15	0	23.44	0	-53.178	0	-78.041
N+6.00	B64	ENVOLVENTE MIN	1.95	0	27.53	0	-53.178	0	-143.539
N+6.00	B64	ENVOLVENTE MIN	1.95	-132.81	33.58	-20.45	-130.809	-168.379	146.92
N+6.00	B64	ENVOLVENTE MIN	2.3	-132.81	35.09	-20.45	-130.809	-176.392	-199.189
N+2.75	B64	ENVOLVENTE MAX	0	0	56.3	0	0.404	0	4.534



Diseños & Estructuras

PROYECTO: I. E. EL SUR (IPALES)- RAMPA
DATOS DE SALIDA DEL MODELO

N+2.75	B64	ENVOLVENTE	MAX	1.15	0	66.8	0	0.404	0	-13.46
N+2.75	B64	ENVOLVENTE	MAX	1.95	0	73.91	0	0.404	0	-28.138
N+2.75	B64	ENVOLVENTE	MAX	1.95	0	155.96	0	10.967	0	-26.657
N+2.75	B64	ENVOLVENTE	MAX	2.3	0	158.72	0	10.967	0	-36.887
N+2.75	B64	ENVOLVENTE	MIN	0	0	9.81	0	-56.774	0	0.032
N+2.75	B64	ENVOLVENTE	MIN	1.15	0	15.76	0	-56.774	0	-65.949
N+2.75	B64	ENVOLVENTE	MIN	1.95	0	19.86	0	-56.774	0	-122.42
N+2.75	B64	ENVOLVENTE	MIN	1.95	0	21.83	0	-129.883	0	-121.403
N+2.75	B64	ENVOLVENTE	MIN	2.3	0	23.52	0	-129.883	0	-176.429
N-0.5	B64	ENVOLVENTE	MAX	0	0	60.7	0	-10.954	0	6.69
N-0.5	B64	ENVOLVENTE	MAX	1.15	0	70.24	0	-10.954	0	-4.256
N-0.5	B64	ENVOLVENTE	MAX	1.95	0	76.74	0	-10.954	0	-12.43
N-0.5	B64	ENVOLVENTE	MAX	1.95	0	161.8	0	-26.305	0	-10.479
N-0.5	B64	ENVOLVENTE	MAX	2.3	0	164.55	0	-26.305	0	-20.286
N-0.5	B64	ENVOLVENTE	MIN	0	0	2.16	0	-62.815	0	1.171
N-0.5	B64	ENVOLVENTE	MIN	1.15	0	8.11	0	-62.815	0	-69.951
N-0.5	B64	ENVOLVENTE	MIN	1.95	0	12.2	0	-62.815	0	-128.881
N-0.5	B64	ENVOLVENTE	MIN	1.95	0	26.38	0	-145.736	0	-128.077
N-0.5	B64	ENVOLVENTE	MIN	2.3	0	28.08	0	-145.736	0	-182.146
N+3.56	B66	ENVOLVENTE	MAX	0	136.93	-98.62	78.06	138.032	77.244	-111.322
N+3.56	B66	ENVOLVENTE	MAX	0.35	136.93	-97.11	78.06	138.032	71.695	-76.815
N+3.56	B66	ENVOLVENTE	MAX	0.35	0	-44.64	0	27.676	0	-72.509
N+3.56	B66	ENVOLVENTE	MAX	1.15	0	-39.78	0	27.676	0	-38.62
N+3.56	B66	ENVOLVENTE	MAX	2.3	0	-32.6	0	27.676	0	7.44
N+3.56	B66	ENVOLVENTE	MIN	0	-136.95	-300.84	-80.16	-133.816	-83.709	-399.168
N+3.56	B66	ENVOLVENTE	MIN	0.35	-136.95	-298.82	-80.16	-133.816	-76.508	-294.227
N+3.56	B66	ENVOLVENTE	MIN	0.35	0	-157.24	0	-24.74	0	-274.306
N+3.56	B66	ENVOLVENTE	MIN	1.15	0	-147.08	0	-24.74	0	-152.11
N+3.56	B66	ENVOLVENTE	MIN	2.3	0	-131.73	0	-24.74	0	2.301
N+0.31	B66	ENVOLVENTE	MAX	0	67.88	-94.95	86.65	86.944	71.101	-116.876
N+0.31	B66	ENVOLVENTE	MAX	0.35	67.88	-93.44	86.65	86.944	60.516	-82.663
N+0.31	B66	ENVOLVENTE	MAX	0.35	0	-47.2	0	17.265	0	-77.655
N+0.31	B66	ENVOLVENTE	MAX	1.15	0	-42.34	0	17.265	0	-41.719
N+0.31	B66	ENVOLVENTE	MAX	2.3	0	-35.16	0	17.265	0	7.372
N+0.31	B66	ENVOLVENTE	MIN	0	-68	-296.03	-64.7	-84.935	-44.33	-394.23
N+0.31	B66	ENVOLVENTE	MIN	0.35	-68	-294.02	-64.7	-84.935	-46.715	-290.972
N+0.31	B66	ENVOLVENTE	MIN	0.35	0	-155.66	0	-15.845	0	-271.288
N+0.31	B66	ENVOLVENTE	MIN	1.15	0	-145.5	0	-15.845	0	-150.358
N+0.31	B66	ENVOLVENTE	MIN	2.3	0	-130.15	0	-15.845	0	2.272
N+0.31	B74	ENVOLVENTE	MAX	0	0	60.24	0	-0.561	0	-8.686
N+0.31	B74	ENVOLVENTE	MAX	0.375	0	61.9	0	-0.561	0	-17.321
N+0.31	B74	ENVOLVENTE	MAX	0.75	0	63.56	0	-0.561	0	-24.993
N+0.31	B74	ENVOLVENTE	MIN	0	0	8.19	0	-3.885	0	-65.456
N+0.31	B74	ENVOLVENTE	MIN	0.375	0	9.01	0	-3.885	0	-88.304
N+0.31	B74	ENVOLVENTE	MIN	0.75	0	9.83	0	-3.885	0	-111.881
N+0.31	B75	ENVOLVENTE	MAX	0	0	66.52	0	9.658	0	-4.979
N+0.31	B75	ENVOLVENTE	MAX	0.375	0	68.18	0	9.658	0	-5.255
N+0.31	B75	ENVOLVENTE	MAX	0.75	0	69.84	0	9.658	0	-5.718
N+0.31	B75	ENVOLVENTE	MIN	0	0	-0.27	0	2.359	0	-59.196
N+0.31	B75	ENVOLVENTE	MIN	0.375	0	0.55	0	2.359	0	-84.397
N+0.31	B75	ENVOLVENTE	MIN	0.75	0	1.38	0	2.359	0	-110.327
N+3.56	B76	ENVOLVENTE	MAX	0	0	20.2	0	-1.122	0	18.284
N+3.56	B76	ENVOLVENTE	MAX	0.375	0	21.02	0	-1.122	0	11.371
N+3.56	B76	ENVOLVENTE	MAX	0.75	0	21.84	0	-1.122	0	4.444
N+3.56	B76	ENVOLVENTE	MIN	0	0	-75.6	0	-10.813	0	-114.259
N+3.56	B76	ENVOLVENTE	MIN	0.375	0	-74.15	0	-10.813	0	-87.769
N+3.56	B76	ENVOLVENTE	MIN	0.75	0	-72.7	0	-10.813	0	-62.009
N+0.31	B76	ENVOLVENTE	MAX	0	0	6.16	0	-2.057	0	3.216
N+0.31	B76	ENVOLVENTE	MAX	0.375	0	6.98	0	-2.057	0	1.145
N+0.31	B76	ENVOLVENTE	MAX	0.75	0	7.81	0	-2.057	0	-1.146
N+0.31	B76	ENVOLVENTE	MIN	0	0	-68.52	0	-10.025	0	-111.693
N+0.31	B76	ENVOLVENTE	MIN	0.375	0	-66.86	0	-10.025	0	-86.256
N+0.31	B76	ENVOLVENTE	MIN	0.75	0	-65.2	0	-10.025	0	-61.547
N+4.37	B82	ENVOLVENTE	MAX	0	0	-9.44	0	0.423	0	-9.022
N+4.37	B82	ENVOLVENTE	MAX	0.975	0	-5.55	0	0.423	0	-1.406
N+4.37	B82	ENVOLVENTE	MAX	1.95	0	-1.65	0	0.423	0	3.915
N+4.37	B82	ENVOLVENTE	MIN	0	0	-34.33	0	-2.312	0	-41.109
N+4.37	B82	ENVOLVENTE	MIN	0.975	0	-23.09	0	-2.312	0	-11.933
N+4.37	B82	ENVOLVENTE	MIN	1.95	0	-12.17	0	-2.312	0	0.71
N+1.12	B82	ENVOLVENTE	MAX	0	0	-10.01	0	0.198	0	-10.223
N+1.12	B82	ENVOLVENTE	MAX	0.975	0	-6.11	0	0.198	0	-2.036
N+1.12	B82	ENVOLVENTE	MAX	1.95	0	-2.21	0	0.198	0	3.887
N+1.12	B82	ENVOLVENTE	MIN	0	0	-33.99	0	-2.021	0	-40.483
N+1.12	B82	ENVOLVENTE	MIN	0.975	0	-22.75	0	-2.021	0	-11.611
N+1.12	B82	ENVOLVENTE	MIN	1.95	0	-11.52	0	-2.021	0	0.722
N+4.37	B83	ENVOLVENTE	MAX	0	0	-8.17	0	2.268	0	-7.094
N+4.37	B83	ENVOLVENTE	MAX	0.975	0	-4.28	0	2.268	0	-0.717
N+4.37	B83	ENVOLVENTE	MAX	1.95	0	-0.38	0	2.268	0	3.704
N+4.37	B83	ENVOLVENTE	MIN	0	0	-33.82	0	-0.594	0	-40.324
N+4.37	B83	ENVOLVENTE	MIN	0.975	0	-22.58	0	-0.594	0	-12.1
N+4.37	B83	ENVOLVENTE	MIN	1.95	0	-12.32	0	-0.594	0	0.832
N+1.12	B83	ENVOLVENTE	MAX	0	0	-8.62	0	1.957	0	-7.956
N+1.12	B83	ENVOLVENTE	MAX	0.975	0	-4.72	0	1.957	0	-1.143
N+1.12	B83	ENVOLVENTE	MAX	1.95	0	-0.82	0	1.957	0	3.791
N+1.12	B83	ENVOLVENTE	MIN	0	0	-33.73	0	-0.182	0	-40.076
N+1.12	B83	ENVOLVENTE	MIN	0.975	0	-22.5	0	-0.182	0	-11.981
N+1.12	B83	ENVOLVENTE	MIN	1.95	0	-12.14	0	-0.182	0	0.959
N+4.37	B84	ENVOLVENTE	MAX	0	0	-4.2	0	-0.193	0	-3.104



Diseños & Estructuras

PROYECTO: I. E. EL SUR (IPALES)- RAMPA
DATOS DE SALIDA DEL MODELO

N+4.37	B84	ENVOLVENTE MAX	0.975	0	-1.16	0	-0.193	0	-0.254
N+4.37	B84	ENVOLVENTE MAX	1.95	0	1.88	0	-0.193	0	-0.167
N+4.37	B84	ENVOLVENTE MIN	0	0	-21.4	0	-5.64	0	-30.391
N+4.37	B84	ENVOLVENTE MIN	0.975	0	-13.55	0	-5.64	0	-13.084
N+4.37	B84	ENVOLVENTE MIN	1.95	0	-6.41	0	-5.64	0	-4.429
N+1.12	B84	ENVOLVENTE MAX	0	0	-4.7	0	-0.425	0	-4.145
N+1.12	B84	ENVOLVENTE MAX	0.975	0	-1.66	0	-0.425	0	-0.805
N+1.12	B84	ENVOLVENTE MAX	1.95	0	1.38	0	-0.425	0	-0.394
N+1.12	B84	ENVOLVENTE MIN	0	0	-21.54	0	-5.309	0	-30.576
N+1.12	B84	ENVOLVENTE MIN	0.975	0	-13.68	0	-5.309	0	-12.731
N+1.12	B84	ENVOLVENTE MIN	1.95	0	-6.39	0	-5.309	0	-4.104
N+4.37	B85	ENVOLVENTE MAX	0	0	-3.78	0	5.291	0	-2.015
N+4.37	B85	ENVOLVENTE MAX	0.975	0	-0.74	0	5.291	0	0.431
N+4.37	B85	ENVOLVENTE MAX	1.95	0	2.29	0	5.291	0	-0.008
N+4.37	B85	ENVOLVENTE MIN	0	0	-21.22	0	0.063	0	-29.711
N+4.37	B85	ENVOLVENTE MIN	0.975	0	-13.37	0	0.063	0	-12.642
N+4.37	B85	ENVOLVENTE MIN	1.95	0	-6.19	0	0.063	0	-4.206
N+1.12	B85	ENVOLVENTE MAX	0	0	-4.54	0	4.896	0	-3.809
N+1.12	B85	ENVOLVENTE MAX	0.975	0	-1.5	0	4.896	0	-0.609
N+1.12	B85	ENVOLVENTE MAX	1.95	0	1.53	0	4.896	0	-0.527
N+1.12	B85	ENVOLVENTE MIN	0	0	-21.5	0	0.701	0	-30.399
N+1.12	B85	ENVOLVENTE MIN	0.975	0	-13.65	0	0.701	0	-12.332
N+1.12	B85	ENVOLVENTE MIN	1.95	0	-5.82	0	0.701	0	-3.85
N+5.187	B86	ENVOLVENTE MAX	0	0	130.16	0	30.177	0	7.432
N+5.187	B86	ENVOLVENTE MAX	1.15	0	145.51	0	30.177	0	-38.983
N+5.187	B86	ENVOLVENTE MAX	1.95	0	155.67	0	30.177	0	-73.107
N+5.187	B86	ENVOLVENTE MAX	1.95	204.25	298.64	88.66	116.956	128.085	-77.492
N+5.187	B86	ENVOLVENTE MAX	2.3	204.25	300.66	88.66	116.956	157.91	-111.815
N+5.187	B86	ENVOLVENTE MIN	0	0	32.89	0	-27.162	0	2.271
N+5.187	B86	ENVOLVENTE MIN	1.15	0	40.07	0	-27.162	0	-150.313
N+5.187	B86	ENVOLVENTE MIN	1.95	0	44.94	0	-27.162	0	-271.253
N+5.187	B86	ENVOLVENTE MIN	1.95	-203.88	93.88	-92.49	-111.066	-138.585	-290.853
N+5.187	B86	ENVOLVENTE MIN	2.3	-203.88	95.39	-92.49	-111.066	-167.066	-395.73
N+1.937	B86	ENVOLVENTE MAX	0	0	130.93	0	28.475	0	7.414
N+1.937	B86	ENVOLVENTE MAX	1.15	0	146.29	0	28.475	0	-40.038
N+1.937	B86	ENVOLVENTE MAX	1.95	0	156.45	0	28.475	0	-74.832
N+1.937	B86	ENVOLVENTE MAX	1.95	0	296.75	0	119.74	0	-79.505
N+1.937	B86	ENVOLVENTE MAX	2.3	0	298.76	0	119.74	0	-113.767
N+1.937	B86	ENVOLVENTE MIN	0	0	33.73	0	-26.802	0	2.429
N+1.937	B86	ENVOLVENTE MIN	1.15	0	40.91	0	-26.802	0	-151.223
N+1.937	B86	ENVOLVENTE MIN	1.95	0	45.78	0	-26.802	0	-272.784
N+1.937	B86	ENVOLVENTE MIN	1.95	0	96.71	0	-118.224	0	-292.576
N+1.937	B86	ENVOLVENTE MIN	2.3	0	98.22	0	-118.224	0	-396.791
BASE	B86	ENVOLVENTE MAX	0	0	-2.49	0.18	74.265	0.211	1.159
BASE	B86	ENVOLVENTE MAX	1.15	0	2.66	0.18	74.265	0.005	1.673
BASE	B86	ENVOLVENTE MAX	1.95	0	7.32	0.18	74.265	0.186	-0.421
BASE	B86	ENVOLVENTE MAX	1.95	0	-2.06	0.32	165.02	0.143	-0.797
BASE	B86	ENVOLVENTE MAX	2.3	0	-0.55	0.32	165.02	0.032	-0.34
BASE	B86	ENVOLVENTE MIN	0	0	-6.41	-0.28	15.392	-0.36	-2.27
BASE	B86	ENVOLVENTE MIN	1.15	0	0.02	-0.28	15.392	-0.041	0.98
BASE	B86	ENVOLVENTE MIN	1.95	0	3.48	-0.28	15.392	-0.142	-2.494
BASE	B86	ENVOLVENTE MIN	1.95	0	-5.42	-0.25	42.899	-0.113	-2.602
BASE	B86	ENVOLVENTE MIN	2.3	0	-3.41	-0.25	42.899	-0.026	-1.057
N+5.187	B89	ENVOLVENTE MAX	0	0	-17.19	0	4.605	0	-19.864
N+5.187	B89	ENVOLVENTE MAX	0.375	0	-16.37	0	4.605	0	-13.119
N+5.187	B89	ENVOLVENTE MAX	0.75	0	-15.54	0	4.605	0	-6.615
N+5.187	B89	ENVOLVENTE MIN	0	0	-66.72	0	-0.688	0	-114.906
N+5.187	B89	ENVOLVENTE MIN	0.375	0	-65.06	0	-0.688	0	-90.144
N+5.187	B89	ENVOLVENTE MIN	0.75	0	-63.4	0	-0.688	0	-67.092
N+1.937	B89	ENVOLVENTE MAX	0	0	-14.35	0	4.613	0	-21.349
N+1.937	B89	ENVOLVENTE MAX	0.375	0	-13.53	0	4.613	0	-15.017
N+1.937	B89	ENVOLVENTE MAX	0.75	0	-12.71	0	4.613	0	-7.756
N+1.937	B89	ENVOLVENTE MIN	0	0	-66.36	0	-0.542	0	-114.63
N+1.937	B89	ENVOLVENTE MIN	0.375	0	-64.7	0	-0.542	0	-90.003
N+1.937	B89	ENVOLVENTE MIN	0.75	0	-63.04	0	-0.542	0	-66.104
N+5.187	B90	ENVOLVENTE MAX	0	0	-11.65	0	0.372	0	-11.494
N+5.187	B90	ENVOLVENTE MAX	0.375	0	-10.83	0	0.372	0	-7.001
N+5.187	B90	ENVOLVENTE MAX	0.75	0	-10.01	0	0.372	0	-2.57
N+5.187	B90	ENVOLVENTE MIN	0	0	-63.44	0	-5.059	0	-113.137
N+5.187	B90	ENVOLVENTE MIN	0.375	0	-61.78	0	-5.059	0	-90.879
N+5.187	B90	ENVOLVENTE MIN	0.75	0	-60.12	0	-5.059	0	-69.518
N+1.937	B90	ENVOLVENTE MAX	0	0	-10.14	0	0.374	0	-14.958
N+1.937	B90	ENVOLVENTE MAX	0.375	0	-9.31	0	0.374	0	-10.803
N+1.937	B90	ENVOLVENTE MAX	0.75	0	-8.49	0	0.374	0	-6.302
N+1.937	B90	ENVOLVENTE MIN	0	0	-64.57	0	-4.889	0	-112.766
N+1.937	B90	ENVOLVENTE MIN	0.375	0	-62.91	0	-4.889	0	-88.809
N+1.937	B90	ENVOLVENTE MIN	0.75	0	-61.25	0	-4.889	0	-66.562
N+5.187	B95	ENVOLVENTE MAX	0	0	-3.96	0	-1.875	0	3.547
N+5.187	B95	ENVOLVENTE MAX	0.375	0	-3.13	0	-1.875	0	5.3
N+5.187	B95	ENVOLVENTE MAX	0.75	0	-2.31	0	-1.875	0	7.043
N+5.187	B95	ENVOLVENTE MIN	0	0	-75.45	0	-10.12	0	-115.125
N+5.187	B95	ENVOLVENTE MIN	0.375	0	-73.79	0	-10.12	0	-87.091
N+5.187	B95	ENVOLVENTE MIN	0.75	0	-72.13	0	-10.12	0	-59.786
N+1.937	B95	ENVOLVENTE MAX	0	0	8.68	0	-1.845	0	10.328
N+1.937	B95	ENVOLVENTE MAX	0.375	0	9.51	0	-1.845	0	7.309
N+1.937	B95	ENVOLVENTE MAX	0.75	0	10.33	0	-1.845	0	4.635
N+1.937	B95	ENVOLVENTE MIN	0	0	-69.92	0	-10.09	0	-111.403
N+1.937	B95	ENVOLVENTE MIN	0.375	0	-68.26	0	-10.09	0	-85.44



Diseños & Estructuras

PROYECTO: I. E. EL SUR (PIALES)- RAMPA
DATOS DE SALIDA DEL MODELO

N+1.937	B95	ENVOLVENTE MIN	0.75	0	-66.71	0	-10.09	0	-60.207
N+5.187	B96	ENVOLVENTE MAX	0	0	4.19	0	10.312	0	8.848
N+5.187	B96	ENVOLVENTE MAX	0.375	0	5.01	0	10.312	0	7.996
N+5.187	B96	ENVOLVENTE MAX	0.75	0	5.83	0	10.312	0	7.534
N+5.187	B96	ENVOLVENTE MIN	0	0	-67.52	0	0.627	0	-111.289
N+5.187	B96	ENVOLVENTE MIN	0.375	0	-65.98	0	0.627	0	-86.226
N+5.187	B96	ENVOLVENTE MIN	0.75	0	-64.53	0	0.627	0	-61.892
N+1.937	B96	ENVOLVENTE MAX	0	0	7.93	0	10.281	0	8.602
N+1.937	B96	ENVOLVENTE MAX	0.375	0	8.75	0	10.281	0	6.371
N+1.937	B96	ENVOLVENTE MAX	0.75	0	9.57	0	10.281	0	3.989
N+1.937	B96	ENVOLVENTE MIN	0	0	-70.38	0	0.92	0	-112.366
N+1.937	B96	ENVOLVENTE MIN	0.375	0	-68.72	0	0.92	0	-86.232
N+1.937	B96	ENVOLVENTE MIN	0.75	0	-67.06	0	0.92	0	-60.827
N+3.56	B99	ENVOLVENTE MAX	0	0	-13.25	0	0.082	0	-19.115
N+3.56	B99	ENVOLVENTE MAX	0.375	0	-12.43	0	0.082	0	-12.428
N+3.56	B99	ENVOLVENTE MAX	0.75	0	-11.6	0	0.082	0	-5.354
N+3.56	B99	ENVOLVENTE MIN	0	0	-63.05	0	-4.83	0	-112.546
N+3.56	B99	ENVOLVENTE MIN	0.375	0	-61.39	0	-4.83	0	-89.161
N+3.56	B99	ENVOLVENTE MIN	0.75	0	-59.73	0	-4.83	0	-68.553
N+3.56	B100	ENVOLVENTE MAX	0	0	-11.17	0	4.466	0	-13.195
N+3.56	B100	ENVOLVENTE MAX	0.375	0	-10.35	0	4.466	0	-7.681
N+3.56	B100	ENVOLVENTE MAX	0.75	0	-9.53	0	4.466	0	-1.93
N+3.56	B100	ENVOLVENTE MIN	0	0	-68.68	0	-0.598	0	-117.882
N+3.56	B100	ENVOLVENTE MIN	0.375	0	-67.02	0	-0.598	0	-94.406
N+3.56	B100	ENVOLVENTE MIN	0.75	0	-65.36	0	-0.598	0	-71.749
N+3.56	B101	ENVOLVENTE MAX	0	0	20.8	0	9.59	0	18.65
N+3.56	B101	ENVOLVENTE MAX	0.375	0	21.62	0	9.59	0	11.019
N+3.56	B101	ENVOLVENTE MAX	0.75	0	22.44	0	9.59	0	3.298
N+3.56	B101	ENVOLVENTE MIN	0	0	-72.92	0	1.747	0	-111.331
N+3.56	B101	ENVOLVENTE MIN	0.375	0	-71.47	0	1.747	0	-85.244
N+3.56	B101	ENVOLVENTE MIN	0.75	0	-70.02	0	1.747	0	-59.885
N+6.00	B113	ENVOLVENTE MAX	0	0	-2.88	0	5.912	0	-1.15
N+6.00	B113	ENVOLVENTE MAX	0.325	0	-2.19	0	5.912	0	-0.316
N+6.00	B113	ENVOLVENTE MAX	0.65	0	-1.51	0	5.912	0	0.276
N+6.00	B113	ENVOLVENTE MIN	0	0	-9.7	0	0.446	0	-9.251
N+6.00	B113	ENVOLVENTE MIN	0.325	0	-8.36	0	0.446	0	-6.429
N+6.00	B113	ENVOLVENTE MIN	0.65	0	-7.02	0	0.446	0	-4.043
N+2.75	B113	ENVOLVENTE MAX	0	0	3.06	0	5.313	0	2.236
N+2.75	B113	ENVOLVENTE MAX	0.325	0	3.75	0	5.313	0	1.178
N+2.75	B113	ENVOLVENTE MAX	0.65	0	4.66	0	5.313	0	-0.111
N+2.75	B113	ENVOLVENTE MIN	0	0	-2.54	0	0.078	0	-3.976
N+2.75	B113	ENVOLVENTE MIN	0.325	0	-1.85	0	0.078	0	-3.886
N+2.75	B113	ENVOLVENTE MIN	0.65	0	-1.16	0	0.078	0	-4.637
N-0.5	B113	ENVOLVENTE MAX	0	0	1.87	0	5.715	0	0.182
N-0.5	B113	ENVOLVENTE MAX	0.325	0	2.86	0	5.715	0	-0.399
N-0.5	B113	ENVOLVENTE MAX	0.65	0	4.04	0	5.715	0	-0.92
N-0.5	B113	ENVOLVENTE MIN	0	0	-1.94	0	0.805	0	-3.903
N-0.5	B113	ENVOLVENTE MIN	0.325	0	-1.26	0	0.805	0	-4.163
N-0.5	B113	ENVOLVENTE MIN	0.65	0	-0.57	0	0.805	0	-5.102
N+6.00	B114	ENVOLVENTE MAX	0	0	-1.96	0	0.043	0	1.856
N+6.00	B114	ENVOLVENTE MAX	0.325	0	-1.27	0	0.043	0	3.168
N+6.00	B114	ENVOLVENTE MAX	0.65	0	-0.58	0	0.043	0	4.043
N+6.00	B114	ENVOLVENTE MIN	0	0	-6.58	0	-2.749	0	-2.852
N+6.00	B114	ENVOLVENTE MIN	0.325	0	-5.4	0	-2.749	0	-1.443
N+6.00	B114	ENVOLVENTE MIN	0.65	0	-4.22	0	-2.749	0	-0.276
N+2.75	B114	ENVOLVENTE MAX	0	0	-2.28	0	2.332	0	0.451
N+2.75	B114	ENVOLVENTE MAX	0.325	0	-1.43	0	2.332	0	1.529
N+2.75	B114	ENVOLVENTE MAX	0.65	0	-0.57	0	2.332	0	4.433
N+2.75	B114	ENVOLVENTE MIN	0	0	-22.56	0	-0.027	0	-9.845
N+2.75	B114	ENVOLVENTE MIN	0.325	0	-20.9	0	-0.027	0	-3.204
N+2.75	B114	ENVOLVENTE MIN	0.65	0	-19.23	0	-0.027	0	0.044
N-0.5	B114	ENVOLVENTE MAX	0	0	-0.38	0	2.51	0	0.901
N-0.5	B114	ENVOLVENTE MAX	0.325	0	0.47	0	2.51	0	1.064
N-0.5	B114	ENVOLVENTE MAX	0.65	0	1.32	0	2.51	0	4.906
N-0.5	B114	ENVOLVENTE MIN	0	0	-23.36	0	0.14	0	-9.482
N-0.5	B114	ENVOLVENTE MIN	0.325	0	-21.7	0	0.14	0	-2.719
N-0.5	B114	ENVOLVENTE MIN	0.65	0	-20.03	0	0.14	0	0.144
N+2.75	B115	ENVOLVENTE MAX	0	0	-2.57	0	0.153	0	1.051
N+2.75	B115	ENVOLVENTE MAX	0.325	0	-1.72	0	0.153	0	1.831
N+2.75	B115	ENVOLVENTE MAX	0.65	0	-0.87	0	0.153	0	4.645
N+2.75	B115	ENVOLVENTE MIN	0	0	-24.93	0	-2.419	0	-11.256
N+2.75	B115	ENVOLVENTE MIN	0.325	0	-23.26	0	-2.419	0	-3.904
N+2.75	B115	ENVOLVENTE MIN	0.65	0	-21.6	0	-2.419	0	0.311
N-0.5	B115	ENVOLVENTE MAX	0	0	-0.59	0	0.443	0	1.352
N-0.5	B115	ENVOLVENTE MAX	0.325	0	0.26	0	0.443	0	1.461
N-0.5	B115	ENVOLVENTE MAX	0.65	0	1.11	0	0.443	0	4.985
N-0.5	B115	ENVOLVENTE MIN	0	0	-22.39	0	-2.178	0	-9.342
N-0.5	B115	ENVOLVENTE MIN	0.325	0	-20.73	0	-2.178	0	-2.813
N-0.5	B115	ENVOLVENTE MIN	0.65	0	-19.07	0	-2.178	0	0.888
N+2.75	B116	ENVOLVENTE MAX	0	0	3.57	0	-0.24	0	2.509
N+2.75	B116	ENVOLVENTE MAX	0.325	0	4.26	0	-0.24	0	1.283
N+2.75	B116	ENVOLVENTE MAX	0.65	0	5.27	0	-0.24	0	-0.166
N+2.75	B116	ENVOLVENTE MIN	0	0	-2.89	0	-5.564	0	-4.305
N+2.75	B116	ENVOLVENTE MIN	0.325	0	-2.2	0	-5.564	0	-4.169
N+2.75	B116	ENVOLVENTE MIN	0.65	0	-1.51	0	-5.564	0	-4.86
N-0.5	B116	ENVOLVENTE MAX	0	0	1.88	0	-1.04	0	0.778
N-0.5	B116	ENVOLVENTE MAX	0.325	0	3.06	0	-1.04	0	0.101
N-0.5	B116	ENVOLVENTE MAX	0.65	0	4.25	0	-1.04	0	-0.795



Diseños & Estructuras

PROYECTO: I. E. EL SUR (IPIALES)- RAMPA
DATOS DE SALIDA DEL MODELO

N-0.5	B116	ENVOLVENTE MIN	0	0	-1.68	0	-5.404	0	-3.793
N-0.5	B116	ENVOLVENTE MIN	0.325	0	-0.99	0	-5.404	0	-3.83
N-0.5	B116	ENVOLVENTE MIN	0.65	0	-0.3	0	-5.404	0	-4.592
N+6.00	B118	ENVOLVENTE MAX	0	0	-1.51	0	0.276	0	-0.446
N+6.00	B118	ENVOLVENTE MAX	0.975	0	0.88	0	0.276	0	0.043
N+6.00	B118	ENVOLVENTE MAX	1.95	0	4.22	0	0.276	0	0.043
N+6.00	B118	ENVOLVENTE MIN	0	0	-7.02	0	-4.043	0	-5.912
N+6.00	B118	ENVOLVENTE MIN	0.975	0	-2.32	0	-4.043	0	-1.286
N+6.00	B118	ENVOLVENTE MIN	1.95	0	0.58	0	-4.043	0	-2.749
N+2.75	B118	ENVOLVENTE MAX	0	0	4.66	0	-0.111	0	-0.078
N+2.75	B118	ENVOLVENTE MAX	0.975	0	9.64	0	-0.111	0	-2.649
N+2.75	B118	ENVOLVENTE MAX	1.95	0	14.93	0	-0.111	0	-5.125
N+2.75	B118	ENVOLVENTE MIN	0	0	-1.16	0	-4.637	0	-5.313
N+2.75	B118	ENVOLVENTE MIN	0.975	0	1.23	0	-4.637	0	-11.662
N+2.75	B118	ENVOLVENTE MIN	1.95	0	3.62	0	-4.637	0	-23.882
N-0.5	B118	ENVOLVENTE MAX	0	0	4.04	0	-0.92	0	-0.805
N-0.5	B118	ENVOLVENTE MAX	0.975	0	8.75	0	-0.92	0	-1.97
N-0.5	B118	ENVOLVENTE MAX	1.95	0	14.05	0	-0.92	0	-5.058
N-0.5	B118	ENVOLVENTE MIN	0	0	-0.57	0	-5.102	0	-5.715
N-0.5	B118	ENVOLVENTE MIN	0.975	0	1.82	0	-5.102	0	-11.424
N-0.5	B118	ENVOLVENTE MIN	1.95	0	4.21	0	-5.102	0	-22.783
N+2.75	B120	ENVOLVENTE MAX	0	0	5.35	0	0.667	0	-6.26
N+2.75	B120	ENVOLVENTE MAX	0.35	0	6.55	0	0.667	0	-6.552
N+2.75	B120	ENVOLVENTE MAX	0.7	0	7.86	0	0.667	0	-5.944
N+2.75	B120	ENVOLVENTE MIN	0	0	-6.2	0	-0.67	0	-25.925
N+2.75	B120	ENVOLVENTE MIN	0.35	0	-5.34	0	-0.67	0	-25.979
N+2.75	B120	ENVOLVENTE MIN	0.7	0	-4.58	0	-0.67	0	-26.641
N-0.5	B120	ENVOLVENTE MAX	0	0	5.77	0	0.809	0	-6.471
N-0.5	B120	ENVOLVENTE MAX	0.35	0	6.53	0	0.809	0	-8.041
N-0.5	B120	ENVOLVENTE MAX	0.7	0	7.28	0	0.809	0	-7.889
N-0.5	B120	ENVOLVENTE MIN	0	0	-7.52	0	-1.057	0	-25.293
N-0.5	B120	ENVOLVENTE MIN	0.35	0	-6.77	0	-1.057	0	-24.75
N-0.5	B120	ENVOLVENTE MIN	0.7	0	-6.01	0	-1.057	0	-24.815
N+2.75	B121	ENVOLVENTE MAX	0	0	-3.27	0	4.86	0	-4.626
N+2.75	B121	ENVOLVENTE MAX	0.975	0	-0.88	0	4.86	0	-2.469
N+2.75	B121	ENVOLVENTE MAX	1.95	0	1.51	0	4.86	0	-0.24
N+2.75	B121	ENVOLVENTE MIN	0	0	-15.16	0	0.166	0	-24.6
N+2.75	B121	ENVOLVENTE MIN	0.975	0	-9.87	0	0.166	0	-12.155
N+2.75	B121	ENVOLVENTE MIN	1.95	0	-5.27	0	0.166	0	-5.564
N-0.5	B121	ENVOLVENTE MAX	0	0	-4.48	0	4.592	0	-6.281
N-0.5	B121	ENVOLVENTE MAX	0.975	0	-2.09	0	4.592	0	-2.941
N-0.5	B121	ENVOLVENTE MAX	1.95	0	0.3	0	4.592	0	-1.04
N-0.5	B121	ENVOLVENTE MIN	0	0	-14.33	0	0.795	0	-23.02
N-0.5	B121	ENVOLVENTE MIN	0.975	0	-9.03	0	0.795	0	-11.387
N-0.5	B121	ENVOLVENTE MIN	1.95	0	-4.25	0	0.795	0	-5.404
N+4.37	B123	ENVOLVENTE MAX	0	0	1.88	0	4.429	0	-0.193
N+4.37	B123	ENVOLVENTE MAX	0.975	0	4.91	0	4.429	0	1.566
N+4.37	B123	ENVOLVENTE MAX	1.95	0	10.33	0	4.429	0	1.983
N+4.37	B123	ENVOLVENTE MIN	0	0	-6.41	0	0.167	0	-5.64
N+4.37	B123	ENVOLVENTE MIN	0.975	0	-2.46	0	0.167	0	-4.042
N+4.37	B123	ENVOLVENTE MIN	1.95	0	0.58	0	0.167	0	-10.288
N+1.12	B123	ENVOLVENTE MAX	0	0	1.38	0	4.104	0	-0.425
N+1.12	B123	ENVOLVENTE MAX	0.975	0	4.41	0	4.104	0	1.195
N+1.12	B123	ENVOLVENTE MAX	1.95	0	10.11	0	4.104	0	1.317
N+1.12	B123	ENVOLVENTE MIN	0	0	-6.39	0	0.394	0	-5.309
N+1.12	B123	ENVOLVENTE MIN	0.975	0	-2.03	0	0.394	0	-3.538
N+1.12	B123	ENVOLVENTE MIN	1.95	0	1.01	0	0.394	0	-9.97
N+4.37	B124	ENVOLVENTE MAX	0	0	1.37	0	0.919	0	1.468
N+4.37	B124	ENVOLVENTE MAX	0.35	0	2.12	0	0.919	0	1.69
N+4.37	B124	ENVOLVENTE MAX	0.7	0	3.28	0	0.919	0	1.879
N+4.37	B124	ENVOLVENTE MIN	0	0	-3.84	0	-0.849	0	-11.672
N+4.37	B124	ENVOLVENTE MIN	0.35	0	-2.52	0	-0.849	0	-11.111
N+4.37	B124	ENVOLVENTE MIN	0.7	0	-1.61	0	-0.849	0	-11.916
N+1.12	B124	ENVOLVENTE MAX	0	0	0.93	0	0.605	0	0.668
N+1.12	B124	ENVOLVENTE MAX	0.35	0	1.68	0	0.605	0	1.039
N+1.12	B124	ENVOLVENTE MAX	0.7	0	2.93	0	0.605	0	1.195
N+1.12	B124	ENVOLVENTE MIN	0	0	-3.17	0	-0.601	0	-10.899
N+1.12	B124	ENVOLVENTE MIN	0.35	0	-1.86	0	-0.601	0	-10.9
N+1.12	B124	ENVOLVENTE MIN	0.7	0	-1.04	0	-0.601	0	-11.659
N+4.37	B125	ENVOLVENTE MAX	0	0	-0.29	0	-0.008	0	2.703
N+4.37	B125	ENVOLVENTE MAX	0.975	0	2.74	0	-0.008	0	2.034
N+4.37	B125	ENVOLVENTE MAX	1.95	0	6.19	0	-0.008	0	-0.063
N+4.37	B125	ENVOLVENTE MIN	0	0	-10.4	0	-4.206	0	-10.97
N+4.37	B125	ENVOLVENTE MIN	0.975	0	-5.33	0	-4.206	0	-4.344
N+4.37	B125	ENVOLVENTE MIN	1.95	0	-2.29	0	-4.206	0	-5.291
N+1.12	B125	ENVOLVENTE MAX	0	0	-0.88	0	-0.527	0	2.001
N+1.12	B125	ENVOLVENTE MAX	0.975	0	2.16	0	-0.527	0	1.697
N+1.12	B125	ENVOLVENTE MAX	1.95	0	5.82	0	-0.527	0	-0.701
N+1.12	B125	ENVOLVENTE MIN	0	0	-9.91	0	-3.85	0	-10.066
N+1.12	B125	ENVOLVENTE MIN	0.975	0	-4.57	0	-3.85	0	-3.969
N+1.12	B125	ENVOLVENTE MIN	1.95	0	-1.53	0	-3.85	0	-4.896
N+3.56	B126	ENVOLVENTE MAX	0	0	-2.45	0	1.518	0	-2.491
N+3.56	B126	ENVOLVENTE MAX	0.975	0	0.03	0	1.518	0	-0.604
N+3.56	B126	ENVOLVENTE MAX	1.95	0	2.85	0	1.518	0	0.675
N+3.56	B126	ENVOLVENTE MIN	0	0	-9.74	0	-1.292	0	-11.047
N+3.56	B126	ENVOLVENTE MIN	0.975	0	-4.58	0	-1.292	0	-4.006
N+3.56	B126	ENVOLVENTE MIN	1.95	0	-0.43	0	-1.292	0	-4.28
N+0.31	B126	ENVOLVENTE MAX	0	0	-2.78	0	0.667	0	-2.828



Diseños & Estructuras

PROYECTO: I. E. EL SUR (IPIALES)- RAMPA
DATOS DE SALIDA DEL MODELO

N+0.31	B126	ENVOLVENTE MAX	0.975	0	-0.3	0	0.667	0	-0.74
N+0.31	B126	ENVOLVENTE MAX	1.95	0	2.64	0	0.667	0	0.379
N+0.31	B126	ENVOLVENTE MIN	0	0	-9.8	0	-0.65	0	-11.026
N+0.31	B126	ENVOLVENTE MIN	0.975	0	-4.46	0	-0.65	0	-3.932
N+0.31	B126	ENVOLVENTE MIN	1.95	0	-0.13	0	-0.65	0	-3.844
N+3.56	B127	ENVOLVENTE MAX	0	0	-2.09	0	2.419	0	-2.699
N+3.56	B127	ENVOLVENTE MAX	0.975	0	0.39	0	2.419	0	-0.653
N+3.56	B127	ENVOLVENTE MAX	1.95	0	3.36	0	2.419	0	1.183
N+3.56	B127	ENVOLVENTE MIN	0	0	-9.85	0	-1.822	0	-11.118
N+3.56	B127	ENVOLVENTE MIN	0.975	0	-5.05	0	-1.822	0	-4.095
N+3.56	B127	ENVOLVENTE MIN	1.95	0	-0.75	0	-1.822	0	-4.933
N+0.31	B127	ENVOLVENTE MAX	0	0	-2.98	0	1.308	0	-3.173
N+0.31	B127	ENVOLVENTE MAX	0.975	0	-0.5	0	1.308	0	-0.777
N+0.31	B127	ENVOLVENTE MAX	1.95	0	2.42	0	1.308	0	0.231
N+0.31	B127	ENVOLVENTE MIN	0	0	-9.85	0	-0.947	0	-11.178
N+0.31	B127	ENVOLVENTE MIN	0.975	0	-4.31	0	-0.947	0	-4.03
N+0.31	B127	ENVOLVENTE MIN	1.95	0	0.05	0	-0.947	0	-3.763
N+5.187	B128	ENVOLVENTE MAX	0	0	1.2	0	2.048	0	1.513
N+5.187	B128	ENVOLVENTE MAX	0.975	0	5.13	0	2.048	0	-0.624
N+5.187	B128	ENVOLVENTE MAX	1.95	0	9.92	0	2.048	0	-1.964
N+5.187	B128	ENVOLVENTE MIN	0	0	-3.73	0	-1.518	0	-5.135
N+5.187	B128	ENVOLVENTE MIN	0.975	0	-0.97	0	-1.518	0	-3.959
N+5.187	B128	ENVOLVENTE MIN	1.95	0	1.52	0	-1.518	0	-10.8
N+1.937	B128	ENVOLVENTE MAX	0	0	0.75	0	1.92	0	0.968
N+1.937	B128	ENVOLVENTE MAX	0.975	0	4.74	0	1.92	0	-0.649
N+1.937	B128	ENVOLVENTE MAX	1.95	0	9.83	0	1.92	0	-2.479
N+1.937	B128	ENVOLVENTE MIN	0	0	-2.88	0	-1.49	0	-4.307
N+1.937	B128	ENVOLVENTE MIN	0.975	0	-0.31	0	-1.49	0	-3.954
N+1.937	B128	ENVOLVENTE MIN	1.95	0	2.18	0	-1.49	0	-11.074
N+5.187	B129	ENVOLVENTE MAX	0	0	0.46	0	2.323	0	0.336
N+5.187	B129	ENVOLVENTE MAX	0.975	0	4.42	0	2.323	0	-0.69
N+5.187	B129	ENVOLVENTE MAX	1.95	0	9.84	0	2.323	0	-2.381
N+5.187	B129	ENVOLVENTE MIN	0	0	-2.56	0	-2.014	0	-3.911
N+5.187	B129	ENVOLVENTE MIN	0.975	0	-0.04	0	-2.014	0	-4.042
N+5.187	B129	ENVOLVENTE MIN	1.95	0	2.45	0	-2.014	0	-11.176
N+1.937	B129	ENVOLVENTE MAX	0	0	0.38	0	2.005	0	0.349
N+1.937	B129	ENVOLVENTE MAX	0.975	0	4.38	0	2.005	0	-0.731
N+1.937	B129	ENVOLVENTE MAX	1.95	0	9.77	0	2.005	0	-2.53
N+1.937	B129	ENVOLVENTE MIN	0	0	-2.62	0	-1.929	0	-4.035
N+1.937	B129	ENVOLVENTE MIN	0.975	0	0	0	-1.929	0	-4.076
N+1.937	B129	ENVOLVENTE MIN	1.95	0	2.48	0	-1.929	0	-11.143

BRACE FORCES

UNID: kN-m

Story	Brace	Load	Loc	P	V2	V3	T	M2	M3
N+3.56	D25	ENVOLVENTE MAX	0	93.93	-15.16	1.38	1.24	6.104	-5.029
N+3.56	D25	ENVOLVENTE MAX	4.195	92.03	4.38	1.38	1.24	0.461	61.981
N+3.56	D25	ENVOLVENTE MAX	8.389	90.13	58.59	1.38	1.24	5.656	2.653
N+3.56	D25	ENVOLVENTE MIN	0	-107.76	-60.31	-1.42	-2.408	-6.249	-68.652
N+3.56	D25	ENVOLVENTE MIN	4.195	-109.66	-4.8	-1.42	-2.408	-0.447	16.097
N+3.56	D25	ENVOLVENTE MIN	8.389	-111.56	14.74	-1.42	-2.408	-5.484	-63.444
N+0.31	D25	ENVOLVENTE MAX	0	140.59	-16.76	0.44	0.877	2.107	-8.5
N+0.31	D25	ENVOLVENTE MAX	4.194	138.71	2.78	0.44	0.877	0.299	62.084
N+0.31	D25	ENVOLVENTE MAX	8.389	136.82	58.77	0.44	0.877	1.599	-7.644
N+0.31	D25	ENVOLVENTE MIN	0	-149.94	-60.13	-0.43	-1.9	-2.055	-65.452
N+0.31	D25	ENVOLVENTE MIN	4.194	-151.82	-3.27	-0.43	-1.9	-0.292	18.42
N+0.31	D25	ENVOLVENTE MIN	8.389	-153.71	16.44	-0.43	-1.9	-1.639	-59.743
N+3.56	D27	ENVOLVENTE MAX	0	392.44	-14	1.36	1.116	5.407	4.853
N+3.56	D27	ENVOLVENTE MAX	4.195	394.34	5.54	1.36	1.116	0.436	53.322
N+3.56	D27	ENVOLVENTE MAX	8.389	396.24	56.76	1.36	1.116	6.292	2.484
N+3.56	D27	ENVOLVENTE MIN	0	-392.99	-62.15	-1.43	-2.852	-5.721	-82.673
N+3.56	D27	ENVOLVENTE MIN	4.195	-391.09	-7.38	-1.43	-2.852	-0.475	12.32
N+3.56	D27	ENVOLVENTE MIN	8.389	-389.19	12.16	-1.43	-2.852	-6.056	-60.066
N+0.31	D27	ENVOLVENTE MAX	0	194.36	-16.95	0.43	0.691	1.542	-11.319
N+0.31	D27	ENVOLVENTE MAX	4.194	196.25	2.59	0.43	0.691	0.286	53.062
N+0.31	D27	ENVOLVENTE MAX	8.389	198.13	56.49	0.43	0.691	2.087	-5.475
N+0.31	D27	ENVOLVENTE MIN	0	-197.96	-62.41	-0.44	-2.284	-1.644	-84.04
N+0.31	D27	ENVOLVENTE MIN	4.194	-196.08	-4.61	-0.44	-2.284	-0.317	15.873
N+0.31	D27	ENVOLVENTE MIN	8.389	-194.2	14.92	-0.44	-2.284	-2.049	-59.2
N+1.12	D28	ENVOLVENTE MAX	0	138.62	-16.19	0.85	1.884	4.035	-2.343
N+1.12	D28	ENVOLVENTE MAX	4.344	136.72	4.05	0.85	1.884	0.388	62.811
N+1.12	D28	ENVOLVENTE MAX	8.688	134.82	60.39	0.85	1.884	3.205	-4.888
N+1.12	D28	ENVOLVENTE MIN	0	-143.55	-62.78	-0.8	-1.392	-3.779	-76.164
N+1.12	D28	ENVOLVENTE MIN	4.344	-145.45	-5.06	-0.8	-1.392	-0.352	16.495
N+1.12	D28	ENVOLVENTE MIN	8.688	-147.35	15.18	-0.8	-1.392	-3.389	-65.767
N+1.12	D29	ENVOLVENTE MAX	0	272.14	-16.19	0.84	2.513	3.955	-3.121
N+1.12	D29	ENVOLVENTE MAX	4.344	270.24	4.05	0.84	2.513	0.374	55.158
N+1.12	D29	ENVOLVENTE MAX	8.688	268.34	57.58	0.84	2.513	3.266	-1.491
N+1.12	D29	ENVOLVENTE MIN	0	-249.99	-65.59	-0.82	-1.189	-3.88	-96.012
N+1.12	D29	ENVOLVENTE MIN	4.344	-251.89	-6.82	-0.82	-1.189	-0.374	12.675
N+1.12	D29	ENVOLVENTE MIN	8.688	-253.79	13.42	-0.82	-1.189	-3.341	-61.212
N+5.187	D33	ENVOLVENTE MAX	0	199.06	-11.66	2.43	2.46	10.464	6.086
N+5.187	D33	ENVOLVENTE MAX	4.344	197.16	8.58	2.43	2.46	0.192	55.621
N+5.187	D33	ENVOLVENTE MAX	8.688	195.26	65.28	2.43	2.46	11.596	5.608



Diseños & Estructuras

PROYECTO: I. E. EL SUR (IPIALES)- RAMPA
DATOS DE SALIDA DEL MODELO

N+5.187	D33	ENVOLVENTE MIN	0	-220.33	-57.9	-2.64	-4.514	-11.341	-62.123
N+5.187	D33	ENVOLVENTE MIN	4.344	-222.24	-5.98	-2.64	-4.514	-0.177	12.605
N+5.187	D33	ENVOLVENTE MIN	8.688	-224.14	14.26	-2.64	-4.514	-10.675	-94.175
N+1.937	D33	ENVOLVENTE MAX	0	265.63	-12.61	1.13	2.098	4.798	2.719
N+1.937	D33	ENVOLVENTE MAX	4.345	263.7	7.63	1.13	2.098	0.287	55.08
N+1.937	D33	ENVOLVENTE MAX	8.689	261.77	65.7	1.13	2.098	5.005	-0.652
N+1.937	D33	ENVOLVENTE MIN	0	-265.97	-57.48	-1.11	-3.753	-4.691	-60.861
N+1.937	D33	ENVOLVENTE MIN	4.345	-267.9	-4.79	-1.11	-3.753	-0.258	13.453
N+1.937	D33	ENVOLVENTE MIN	8.689	-269.83	15.46	-1.11	-3.753	-5.053	-96.555
N+5.187	D34	ENVOLVENTE MAX	0	53.91	-15.72	2.45	2.642	10.747	-0.774
N+5.187	D34	ENVOLVENTE MAX	4.344	55.81	4.53	2.45	2.642	0.199	62.491
N+5.187	D34	ENVOLVENTE MAX	8.688	57.71	60.08	2.45	2.642	11.203	-0.682
N+5.187	D34	ENVOLVENTE MIN	0	-81.62	-63.1	-2.6	-3.823	-11.361	-86.55
N+5.187	D34	ENVOLVENTE MIN	4.344	-77.05	-6.41	-2.6	-3.823	-0.177	14.82
N+5.187	D34	ENVOLVENTE MIN	8.688	-72.49	14.46	-2.6	-3.823	-10.511	-71.097
N+1.937	D34	ENVOLVENTE MAX	0	84.87	-16.52	1.15	2.273	5.161	-4.075
N+1.937	D34	ENVOLVENTE MAX	4.345	86.8	3.72	1.15	2.273	0.277	62.237
N+1.937	D34	ENVOLVENTE MAX	8.689	88.72	60.21	1.15	2.273	4.642	-4.717
N+1.937	D34	ENVOLVENTE MIN	0	-101.38	-62.97	-1.1	-3.071	-4.925	-82.524
N+1.937	D34	ENVOLVENTE MIN	4.345	-96.74	-5.43	-1.1	-3.071	-0.269	15.52
N+1.937	D34	ENVOLVENTE MIN	8.689	-92.11	15.39	-1.1	-3.071	-4.862	-68.072
N+6.00	D37	ENVOLVENTE MAX	0	25.57	-15.47	2.2	2.074	9.355	-6.013
N+6.00	D37	ENVOLVENTE MAX	4.195	27.47	4.06	2.2	2.074	0.167	62.792
N+6.00	D37	ENVOLVENTE MAX	8.389	29.37	58.34	2.2	2.074	10.017	2.714
N+6.00	D37	ENVOLVENTE MIN	0	-40.97	-60.56	-2.41	-1.832	-10.225	-68.224
N+6.00	D37	ENVOLVENTE MIN	4.195	-36.4	-4.73	-2.41	-1.832	-0.146	16.69
N+6.00	D37	ENVOLVENTE MIN	8.389	-31.83	14.81	-2.41	-1.832	-9.104	-62.429
N+2.75	D37	ENVOLVENTE MAX	0	74.36	-15.61	1.06	2.086	4.503	-7.137
N+2.75	D37	ENVOLVENTE MAX	4.195	76.26	3.92	1.06	2.086	0.295	62.99
N+2.75	D37	ENVOLVENTE MAX	8.389	78.16	58.31	1.06	2.086	4.455	2.625
N+2.75	D37	ENVOLVENTE MIN	0	-83.12	-60.59	-1.07	-1.469	-4.584	-66.473
N+2.75	D37	ENVOLVENTE MIN	4.195	-81.22	-4.61	-1.07	-1.469	-0.307	16.237
N+2.75	D37	ENVOLVENTE MIN	8.389	-79.32	14.93	-1.07	-1.469	-4.399	-60.339
N+6.00	D38	ENVOLVENTE MAX	0	120.34	-11.62	2.19	2.583	9.308	6.098
N+6.00	D38	ENVOLVENTE MAX	4.195	122.24	7.92	2.19	2.583	0.182	54.276
N+6.00	D38	ENVOLVENTE MAX	8.389	124.14	62.09	2.19	2.583	10.1	6.656
N+6.00	D38	ENVOLVENTE MIN	0	-159.89	-56.81	-2.43	-1.682	-10.278	-59.341
N+6.00	D38	ENVOLVENTE MIN	4.195	-157.99	-6.14	-2.43	-1.682	-0.131	13.661
N+6.00	D38	ENVOLVENTE MIN	8.389	-156.09	13.39	-2.43	-1.682	-9.028	-81.491
N+2.75	D38	ENVOLVENTE MAX	0	261.81	-11.92	1.05	2.505	4.467	3.861
N+2.75	D38	ENVOLVENTE MAX	4.195	263.71	7.62	1.05	2.505	0.308	53.617
N+2.75	D38	ENVOLVENTE MAX	8.389	265.61	62.13	1.05	2.505	4.535	5.784
N+2.75	D38	ENVOLVENTE MIN	0	-263.59	-56.77	-1.09	-1.359	-4.635	-59.838
N+2.75	D38	ENVOLVENTE MIN	4.195	-261.69	-5.81	-1.09	-1.359	-0.297	12.734
N+2.75	D38	ENVOLVENTE MIN	8.389	-259.79	13.73	-1.09	-1.359	-4.345	-82.312
N+4.37	D41	ENVOLVENTE MAX	0	114.78	-14.12	2.01	2.869	8.371	-0.798
N+4.37	D41	ENVOLVENTE MAX	4.344	116.68	6.12	2.01	2.869	0.491	63.717
N+4.37	D41	ENVOLVENTE MAX	8.688	118.58	62.25	2.01	2.869	9.218	5.218
N+4.37	D41	ENVOLVENTE MIN	0	-137.01	-60.93	-2.04	-2.731	-8.508	-73.854
N+4.37	D41	ENVOLVENTE MIN	4.344	-135.11	-5.48	-2.04	-2.731	-0.521	15.822
N+4.37	D41	ENVOLVENTE MIN	8.688	-133.21	14.76	-2.04	-2.731	-9.138	-82.875
N+4.37	D42	ENVOLVENTE MAX	0	404.23	-12.15	2	3.53	8.319	3.568
N+4.37	D42	ENVOLVENTE MAX	4.344	406.13	8.09	2	3.53	0.513	56.086
N+4.37	D42	ENVOLVENTE MAX	8.688	408.03	65.32	2	3.53	9.306	4.133
N+4.37	D42	ENVOLVENTE MIN	0	-405.63	-57.86	-2.06	-2.587	-8.563	-61.473
N+4.37	D42	ENVOLVENTE MIN	4.344	-403.73	-5.48	-2.06	-2.587	-0.508	12.31
N+4.37	D42	ENVOLVENTE MIN	8.688	-401.82	14.76	-2.06	-2.587	-9.051	-93.896
N-0.5	D46	ENVOLVENTE MAX	0	88.85	-19.52	0.1	1.36	0.373	-24.653
N-0.5	D46	ENVOLVENTE MAX	4.579	91.25	1.77	0.1	1.36	0.15	57.936
N-0.5	D46	ENVOLVENTE MAX	9.158	93.65	64.71	0.1	1.36	0.59	-18.443
N-0.5	D46	ENVOLVENTE MIN	0	-94.69	-64.87	-0.1	-1.844	-0.404	-90.755
N-0.5	D46	ENVOLVENTE MIN	4.579	-92.28	-1.8	-0.1	-1.844	-0.153	15.833
N-0.5	D46	ENVOLVENTE MIN	9.158	-89.88	19.5	-0.1	-1.844	-0.577	-90.044
N-0.5	D52	ENVOLVENTE MAX	0	144.44	-19.47	0.11	1.124	0.434	-15.392
N-0.5	D52	ENVOLVENTE MAX	4.579	146.84	1.83	0.11	1.124	0.124	77.932
N-0.5	D52	ENVOLVENTE MAX	9.158	149.24	63.95	0.11	1.124	0.501	-11.433
N-0.5	D52	ENVOLVENTE MIN	0	-178.58	-65.64	-0.09	-2.249	-0.366	-74.265
N-0.5	D52	ENVOLVENTE MIN	4.579	-176.18	-2.8	-0.09	-2.249	-0.161	23.026
N-0.5	D52	ENVOLVENTE MIN	9.158	-173.78	18.87	-0.09	-2.249	-0.614	-66.543

FUERZAS EN COLUMNAS

COLUMN FORCES

UNID: kN-m

Story	Column	Load	Loc	P	V2	V3	T	M2	M3
N+4.37	C10	ENVOLVENTE MAX	0	-94.03	170.2	114.79	269.114	126.062	148.873
N+4.37	C10	ENVOLVENTE MAX	0.406	-88.51	170.2	114.79	269.114	161.678	87.581
N+4.37	C10	ENVOLVENTE MAX	0.813	-82.98	170.2	114.79	269.114	197.295	48.919
N+4.37	C10	ENVOLVENTE MIN	0	-436.36	-170.69	-168.33	-272.162	5.827	-166.372
N+4.37	C10	ENVOLVENTE MIN	0.406	-428.98	-170.69	-168.33	-272.162	-17.207	-104.882
N+4.37	C10	ENVOLVENTE MIN	0.813	-421.61	-170.69	-168.33	-272.162	-56.245	-66.021
N+3.56	C10	ENVOLVENTE MAX	0	-105.09	177.82	125.71	269.114	145.664	287.714
N+3.56	C10	ENVOLVENTE MAX	0.406	-99.56	177.82	125.71	269.114	112.137	217.568
N+3.56	C10	ENVOLVENTE MAX	0.812	-94.03	177.82	125.71	269.114	126.062	148.873
N+3.56	C10	ENVOLVENTE MIN	0	-451.09	-178.31	-179.25	-272.162	-112.68	-305.61
N+3.56	C10	ENVOLVENTE MIN	0.406	-443.72	-178.31	-179.25	-272.162	-42.724	-235.265



Diseños & Estructuras

PROYECTO: I. E. EL SUR (IPALES)- RAMPA
DATOS DE SALIDA DEL MODELO

N+3.56	C10	ENVOLVENTE MIN	0.812	-436.36	-178.31	-179.25	-272.162	5.827	-166.372
N+2.75	C10	ENVOLVENTE MAX	0	-116.14	181.78	133.61	269.114	252.165	432.97
N+2.75	C10	ENVOLVENTE MAX	0.406	-110.61	181.78	133.61	269.114	198.562	360.023
N+2.75	C10	ENVOLVENTE MAX	0.812	-105.09	181.78	133.61	269.114	145.664	287.714
N+2.75	C10	ENVOLVENTE MIN	0	-465.83	-182.27	-187.15	-272.162	-262.676	-451.261
N+2.75	C10	ENVOLVENTE MIN	0.406	-458.46	-182.27	-187.15	-272.162	-187.326	-378.117
N+2.75	C10	ENVOLVENTE MIN	0.812	-451.09	-182.27	-187.15	-272.162	-112.68	-305.61
N+1.937	C10	ENVOLVENTE MAX	0	-127.36	183.15	138.92	269.114	365.501	582.743
N+1.937	C10	ENVOLVENTE MAX	0.412	-121.75	183.15	138.92	269.114	308.707	507.767
N+1.937	C10	ENVOLVENTE MAX	0.824	-116.14	183.15	138.92	269.114	252.165	432.97
N+1.937	C10	ENVOLVENTE MIN	0	-480.79	-183.63	-192.45	-272.162	-420.15	-601.437
N+1.937	C10	ENVOLVENTE MIN	0.412	-473.31	-183.63	-192.45	-272.162	-341.287	-526.26
N+1.937	C10	ENVOLVENTE MIN	0.824	-465.83	-183.63	-192.45	-272.162	-262.676	-451.261
N+1.12	C10	ENVOLVENTE MAX	0	-232.57	260.49	338.97	369.565	540.06	743.01
N+1.12	C10	ENVOLVENTE MAX	0.406	-227.04	260.49	338.97	369.565	433.941	665.852
N+1.12	C10	ENVOLVENTE MAX	0.813	-221.51	260.49	338.97	369.565	340.587	594.152
N+1.12	C10	ENVOLVENTE MIN	0	-918.08	-260.75	-393.54	-371.429	-514.648	-767.546
N+1.12	C10	ENVOLVENTE MIN	0.406	-910.71	-260.75	-393.54	-371.429	-386.358	-690.281
N+1.12	C10	ENVOLVENTE MIN	0.813	-903.34	-260.75	-393.54	-371.429	-270.834	-618.474
N+0.31	C10	ENVOLVENTE MAX	0	-243.52	265.59	342.3	369.565	797.778	917.119
N+0.31	C10	ENVOLVENTE MAX	0.403	-238.04	265.59	342.3	369.565	665.528	826.244
N+0.31	C10	ENVOLVENTE MAX	0.805	-232.57	265.59	342.3	369.565	540.06	743.01
N+0.31	C10	ENVOLVENTE MIN	0	-932.69	-265.85	-396.86	-371.429	-816.291	-941.867
N+0.31	C10	ENVOLVENTE MIN	0.403	-925.39	-265.85	-396.86	-371.429	-662.078	-850.886
N+0.31	C10	ENVOLVENTE MIN	0.805	-918.08	-265.85	-396.86	-371.429	-514.648	-767.546
N-0.5	C10	ENVOLVENTE MAX	0	-257.48	268.14	343.88	369.565	1143.535	1169.23
N-0.5	C10	ENVOLVENTE MAX	0.513	-250.5	268.14	343.88	369.565	969.918	1041.065
N-0.5	C10	ENVOLVENTE MAX	1.026	-243.52	268.14	343.88	369.565	797.778	917.119
N-0.5	C10	ENVOLVENTE MIN	0	-951.31	-268.4	-398.44	-371.429	-1218.031	-1194.248
N-0.5	C10	ENVOLVENTE MIN	0.513	-942	-268.4	-398.44	-371.429	-1016.423	-1065.949
N-0.5	C10	ENVOLVENTE MIN	1.026	-932.69	-268.4	-398.44	-371.429	-816.291	-941.867
N+6.00	C13	ENVOLVENTE MAX	0	-46.14	159.25	80.81	153.466	30.826	49.778
N+6.00	C13	ENVOLVENTE MAX	0.406	-40.62	159.25	80.81	153.466	19.096	-13.436
N+6.00	C13	ENVOLVENTE MAX	0.813	-35.09	159.25	80.81	153.466	13.192	-59.009
N+6.00	C13	ENVOLVENTE MIN	0	-165.09	-158.52	-18.49	-176.392	-91.716	-285.161
N+6.00	C13	ENVOLVENTE MIN	0.406	-157.72	-158.52	-18.49	-176.392	-107.903	-222.241
N+6.00	C13	ENVOLVENTE MIN	0.813	-150.35	-158.52	-18.49	-176.392	-130.809	-199.189
N+5.187	C13	ENVOLVENTE MAX	0	-57.2	181.37	81.25	153.466	55.455	195.899
N+5.187	C13	ENVOLVENTE MAX	0.406	-51.67	181.37	81.25	153.466	40.957	122.676
N+5.187	C13	ENVOLVENTE MAX	0.813	-46.14	181.37	81.25	153.466	30.826	49.778
N+5.187	C13	ENVOLVENTE MIN	0	-179.83	-180.65	-23.12	-176.392	-72.278	-430.69
N+5.187	C13	ENVOLVENTE MIN	0.406	-172.46	-180.65	-23.12	-176.392	-77.145	-357.763
N+5.187	C13	ENVOLVENTE MIN	0.813	-165.09	-180.65	-23.12	-176.392	-91.716	-285.161
N+4.37	C13	ENVOLVENTE MAX	0	-68.26	198.64	82.28	153.466	90.771	356.459
N+4.37	C13	ENVOLVENTE MAX	0.406	-62.73	198.64	82.28	153.466	70.754	276.113
N+4.37	C13	ENVOLVENTE MAX	0.813	-57.2	198.64	82.28	153.466	55.455	195.899
N+4.37	C13	ENVOLVENTE MIN	0	-194.58	-197.91	-30.36	-176.392	-74.192	-590.66
N+4.37	C13	ENVOLVENTE MIN	0.406	-187.2	-197.91	-30.36	-176.392	-70.875	-510.609
N+4.37	C13	ENVOLVENTE MIN	0.813	-179.83	-197.91	-30.36	-176.392	-72.278	-430.69
N+3.56	C13	ENVOLVENTE MAX	0	-79.31	211.73	83.28	153.466	145.352	527.471
N+3.56	C13	ENVOLVENTE MAX	0.406	-73.78	211.73	83.28	153.466	113.68	441.909
N+3.56	C13	ENVOLVENTE MAX	0.812	-68.26	211.73	83.28	153.466	90.771	356.459
N+3.56	C13	ENVOLVENTE MIN	0	-209.31	-211	-37.64	-176.392	-89.356	-761.082
N+3.56	C13	ENVOLVENTE MIN	0.406	-201.94	-211	-37.64	-176.392	-80.094	-675.814
N+3.56	C13	ENVOLVENTE MIN	0.812	-194.58	-211	-37.64	-176.392	-74.192	-590.66
N+2.75	C13	ENVOLVENTE MAX	0	-138.07	342.02	275.63	203.301	122.019	768.383
N+2.75	C13	ENVOLVENTE MAX	0.406	-132.55	342.02	275.63	203.301	51.007	639.034
N+2.75	C13	ENVOLVENTE MAX	0.812	-127.02	342.02	275.63	203.301	71.061	512.112
N+2.75	C13	ENVOLVENTE MIN	0	-546.51	-341.05	-217.31	-197.08	-192.367	-991.149
N+2.75	C13	ENVOLVENTE MIN	0.406	-539.14	-341.05	-217.31	-197.08	-183.848	-862.193
N+2.75	C13	ENVOLVENTE MIN	0.812	-531.77	-341.05	-217.31	-197.08	-231.515	-735.663
N+1.937	C13	ENVOLVENTE MAX	0	-149.29	350.72	282.03	203.301	328.904	1041.391
N+1.937	C13	ENVOLVENTE MAX	0.412	-143.68	350.72	282.03	203.301	222.28	904.074
N+1.937	C13	ENVOLVENTE MAX	0.824	-138.07	350.72	282.03	203.301	122.019	768.383
N+1.937	C13	ENVOLVENTE MIN	0	-561.46	-349.76	-223.72	-197.08	-351.178	-1263.361
N+1.937	C13	ENVOLVENTE MIN	0.412	-553.99	-349.76	-223.72	-197.08	-268.591	-1126.442
N+1.937	C13	ENVOLVENTE MIN	0.824	-546.51	-349.76	-223.72	-197.08	-192.367	-991.149
N+1.12	C13	ENVOLVENTE MAX	0	-160.35	356.09	286.11	203.301	551.765	1321.105
N+1.12	C13	ENVOLVENTE MAX	0.406	-154.82	356.09	286.11	203.301	438.927	1180.439
N+1.12	C13	ENVOLVENTE MAX	0.813	-149.29	356.09	286.11	203.301	328.904	1041.391
N+1.12	C13	ENVOLVENTE MIN	0	-576.21	-355.12	-227.8	-197.08	-526.654	-1542.29
N+1.12	C13	ENVOLVENTE MIN	0.406	-568.84	-355.12	-227.8	-197.08	-437.509	-1402.017
N+1.12	C13	ENVOLVENTE MIN	0.813	-561.46	-355.12	-227.8	-197.08	-351.178	-1263.361
N+0.31	C13	ENVOLVENTE MAX	0	-171.3	359.01	288.38	203.301	779.866	1604.475
N+0.31	C13	ENVOLVENTE MAX	0.403	-165.83	359.01	288.38	203.301	665.509	1462.398
N+0.31	C13	ENVOLVENTE MAX	0.805	-160.35	359.01	288.38	203.301	551.765	1321.105
N+0.31	C13	ENVOLVENTE MIN	0	-590.81	-358.05	-230.06	-197.08	-707.812	-1824.882
N+0.31	C13	ENVOLVENTE MIN	0.403	-583.51	-358.05	-230.06	-197.08	-616.926	-1683.193
N+0.31	C13	ENVOLVENTE MIN	0.805	-576.21	-358.05	-230.06	-197.08	-526.654	-1542.29
N-0.5	C13	ENVOLVENTE MAX	0	-268.22	392.59	451.44	207.578	1022.538	1962.409
N-0.5	C13	ENVOLVENTE MAX	0.513	-261.24	392.59	451.44	207.578	820.391	1773.991
N-0.5	C13	ENVOLVENTE MAX	1.026	-254.26	392.59	451.44	207.578	649.31	1589.075
N-0.5	C13	ENVOLVENTE MIN	0	-935.91	-391.64	-350.3	-238.727	-1026.659	-2174.975
N-0.5	C13	ENVOLVENTE MIN	0.513	-926.6	-391.64	-350.3	-238.727	-876.399	-1987.047
N-0.5	C13	ENVOLVENTE MIN	1.026	-917.29	-391.64	-350.3	-238.727	-757.205	-1802.62
N+5.187	C14	ENVOLVENTE MAX	0	-106.62	224.86	103.03	157.91	52.209	30.343
N+5.187	C14	ENVOLVENTE MAX	0.406	-101	224.86	103.03	157.91	80.444	-58.53
N+5.187	C14	ENVOLVENTE MAX	0.813	-95.39	224.86	103.03	157.91	116.956	-111.815



Diseños & Estructuras

PROYECTO: I. E. EL SUR (IPIALES)- RAMPA
DATOS DE SALIDA DEL MODELO

N+5.187	C14	ENVOLVENTE MIN	0	-315.63	-225.23	-106.86	-167.066	-49.435	-489.254
N+5.187	C14	ENVOLVENTE MIN	0.406	-308.14	-225.23	-106.86	-167.066	-76.112	-400.231
N+5.187	C14	ENVOLVENTE MIN	0.813	-300.66	-225.23	-106.86	-167.066	-111.066	-395.73
N+4.37	C14	ENVOLVENTE MAX	0	-117.85	241.41	115.09	157.91	84.173	224.568
N+4.37	C14	ENVOLVENTE MAX	0.406	-112.24	241.41	115.09	157.91	50.156	127.183
N+4.37	C14	ENVOLVENTE MAX	0.813	-106.62	241.41	115.09	157.91	52.209	30.343
N+4.37	C14	ENVOLVENTE MIN	0	-330.61	-241.78	-118.92	-167.066	-84.516	-683.78
N+4.37	C14	ENVOLVENTE MIN	0.406	-323.12	-241.78	-118.92	-167.066	-48.941	-586.245
N+4.37	C14	ENVOLVENTE MIN	0.813	-315.63	-241.78	-118.92	-167.066	-49.435	-489.254
N+3.56	C14	ENVOLVENTE MAX	0	-240.27	375.34	175.59	191.595	75.631	645.667
N+3.56	C14	ENVOLVENTE MAX	0.406	-234.66	375.34	175.59	191.595	53.57	497.631
N+3.56	C14	ENVOLVENTE MAX	0.812	-229.05	375.34	175.59	191.595	103.051	352.28
N+3.56	C14	ENVOLVENTE MIN	0	-646.42	-375.73	-177.33	-197.281	-81.603	-642.944
N+3.56	C14	ENVOLVENTE MIN	0.406	-638.93	-375.73	-177.33	-197.281	-58.835	-494.749
N+3.56	C14	ENVOLVENTE MIN	0.812	-631.45	-375.73	-177.33	-197.281	-107.61	-349.239
N+2.75	C14	ENVOLVENTE MAX	0	-251.5	385.25	184.05	191.595	211.503	952.498
N+2.75	C14	ENVOLVENTE MAX	0.406	-245.89	385.25	184.05	191.595	140.442	798.564
N+2.75	C14	ENVOLVENTE MAX	0.812	-240.27	385.25	184.05	191.595	75.631	645.667
N+2.75	C14	ENVOLVENTE MIN	0	-661.39	-385.64	-185.79	-197.281	-218.889	-950.093
N+2.75	C14	ENVOLVENTE MIN	0.406	-653.9	-385.64	-185.79	-197.281	-147.121	-796
N+2.75	C14	ENVOLVENTE MIN	0.812	-646.42	-385.64	-185.79	-197.281	-81.603	-642.944
N+1.937	C14	ENVOLVENTE MAX	0	-366.13	468.25	228.13	260.567	269.595	1162.039
N+1.937	C14	ENVOLVENTE MAX	0.412	-360.43	468.25	228.13	260.567	183.422	977.863
N+1.937	C14	ENVOLVENTE MAX	0.824	-354.73	468.25	228.13	260.567	102.27	796.794
N+1.937	C14	ENVOLVENTE MIN	0	-975.35	-468.84	-222.65	-271.481	-270.949	-1619.878
N+1.937	C14	ENVOLVENTE MIN	0.412	-967.75	-468.84	-222.65	-271.481	-187.034	-1435.457
N+1.937	C14	ENVOLVENTE MIN	0.824	-960.15	-468.84	-222.65	-271.481	-108.138	-1254.144
N+1.12	C14	ENVOLVENTE MAX	0	-377.36	474.16	232.59	260.567	449.931	1534.559
N+1.12	C14	ENVOLVENTE MAX	0.406	-371.74	474.16	232.59	260.567	358.599	1347.39
N+1.12	C14	ENVOLVENTE MAX	0.813	-366.13	474.16	232.59	260.567	269.595	1162.039
N+1.12	C14	ENVOLVENTE MIN	0	-990.33	-474.75	-227.11	-271.481	-446.835	-1992.88
N+1.12	C14	ENVOLVENTE MIN	0.406	-982.84	-474.75	-227.11	-271.481	-357.727	-1805.47
N+1.12	C14	ENVOLVENTE MIN	0.813	-975.35	-474.75	-227.11	-271.481	-270.949	-1619.878
N+0.31	C14	ENVOLVENTE MAX	0	-488.58	513.71	284.63	251.171	583.719	2055.35
N+0.31	C14	ENVOLVENTE MAX	0.403	-483.01	513.71	284.63	251.171	472.368	1857.216
N+0.31	C14	ENVOLVENTE MAX	0.805	-477.45	513.71	284.63	251.171	365.216	1661.854
N+0.31	C14	ENVOLVENTE MIN	0	-1301.2	-514.42	-301.1	-278.206	-595.89	-2057.49
N+0.31	C14	ENVOLVENTE MIN	0.403	-1293.78	-514.42	-301.1	-278.206	-477.911	-1859.069
N+0.31	C14	ENVOLVENTE MIN	0.805	-1286.36	-514.42	-301.1	-278.206	-364.129	-1663.421
N-0.5	C14	ENVOLVENTE MAX	0	-502.76	515.59	286.39	251.171	873.411	2569.187
N-0.5	C14	ENVOLVENTE MAX	0.513	-495.67	515.59	286.39	251.171	728.067	2311.217
N-0.5	C14	ENVOLVENTE MAX	1.026	-488.58	515.59	286.39	251.171	583.719	2055.35
N-0.5	C14	ENVOLVENTE MIN	0	-1320.11	-516.31	-302.86	-278.206	-902.481	-2572.058
N-0.5	C14	ENVOLVENTE MIN	0.513	-1310.65	-516.31	-302.86	-278.206	-748.688	-2313.723
N-0.5	C14	ENVOLVENTE MIN	1.026	-1301.2	-516.31	-302.86	-278.206	-595.89	-2057.49