



PROYECTO

COLEGIO Y TEATRO EL ENSUEÑO

MODULO I

ANALISIS Y DISEÑO ESTRUCTURAL

MEMORIA DE CALCULOS



1.0 DESCRIPCION DE PROYECTO.

El modulo I del colegio es una edificacion con un nivel de losa aligerada soportada en porticos y vigas de concreto, cimentados en caissons.

2.0 UBICACION

Bogota - Cundinamarca.

3.0 TIPO DE SISTEMA - ESTRUCTURAL

Porticos de concreto.



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4.0 GEOMETRIA

4.1 NIVELES

N+0.00	Primer piso
N+3.50	Losa segundo piso

4.2 EJES LONGITUDINALES

EJES 1A-6A

4.3 EJES TRANSVERSALES

EJES A-C

4.4 TIPOS DE LOSA

Losa Aligerada (H=50cm)

4.5 TIPOS DE CIMENTACION

Caissons

5.0 ESPECIFICACIONES DE MATERIALES

5.1 CONCRETO

$f'c = 28 \text{ Mpa}$	Cimentacion y estructura.
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5.2 ACERO DE REFUERZO

$F_y = 420 \text{ Mpa}$	$\emptyset \geq 3/8"$
$F_y = 260 \text{ Mpa}$	$\emptyset \leq 1/4"$
$F_y = 420 \text{ Mpa}$	Mallas electrosoldadas

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5.3 ACERO ESTRUCTURAL

Perfiles Laminados y Platinas ASTM A-572 gr50 (Fy=350 Mpa)
 Perfiles Tubulares ASTM A-588 (Fy=350 Mpa)
 Acero de Steel Deck -Lamina Colaborante ASTM A-570 (Fy=232 Mpa)
 Acero de Elementos Formados en Frio (Fy=350 Mpa)
 Uniones:
 Pernos de Anclaje Astm A-307 (Pernos B-7)
 Tornillos de Alta Resistencia ASTM A-325
 Soldaduras E70XX

6.0 RESUMEN DE CARGAS

N+3.50

CM: 730 kg/m2 CG: 100 kg/m2
 CV: 200 kg/m2

7.0 CALCULO DEL COEFICIENTE R

SISTEMA ESTRUCTURAL :
 GRADO DE DISIPACION DE ENERGIA:

R_o:
Ω_o:

IRREGULARIDADES: (ver Anexo)

Planta **Ø_p:**
 Alzada **Ø_a:**
 Redundancia **Ø_r:**

Porticos de concreto	
DMO	
5	
3.0	
1	
1	
0.75	

FACTOR R:

3.75

8.0 PARAMETROS ESTUDIO DE SUELOS

Estudio de suelos realizado por el GRUPO CAÑASGORDAS: Ing. Carlos Julio Echeverry

8.1 ESPECTRO DE DISEÑO

Zona de Amenaza Sísmica:
 Aceleracion Pico Efectiva
 Velocidad Pico Efectiva

Intermedia	
Aa:	0.15
Av:	0.2

8.2 RECOMENDACIONES DE CIMENTACION

Caissons a 17mts.



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9.0 REVISION DE DERIVAS

Deriva Maxima en el Sentido Longitudinal: 0.33% <= 1% **OK!**

Deriva Maxima en el Sentido Transversal: 0.29% <= 1% **OK!**

9.2 UMBRAL DE DAÑO

Deriva Maxima en el Sentido Longitudinal: 0.18% <= 0.40% **OK!**

Deriva Maxima en el Sentido Transversal: 0.16% <= 0.40% **OK!**



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- 2.7. RESUMEN DE CARGAS SISMICAS

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- 6.2. DISEÑO DE VIGAS
- 6.3. DISEÑO DE COLUMNAS METALICAS
- 6.4. CHEQUEO DE CONFINAMIENTO
- 6.5. CHEQUEO DE COLUMNA FUERTE-VIGA DEBIL

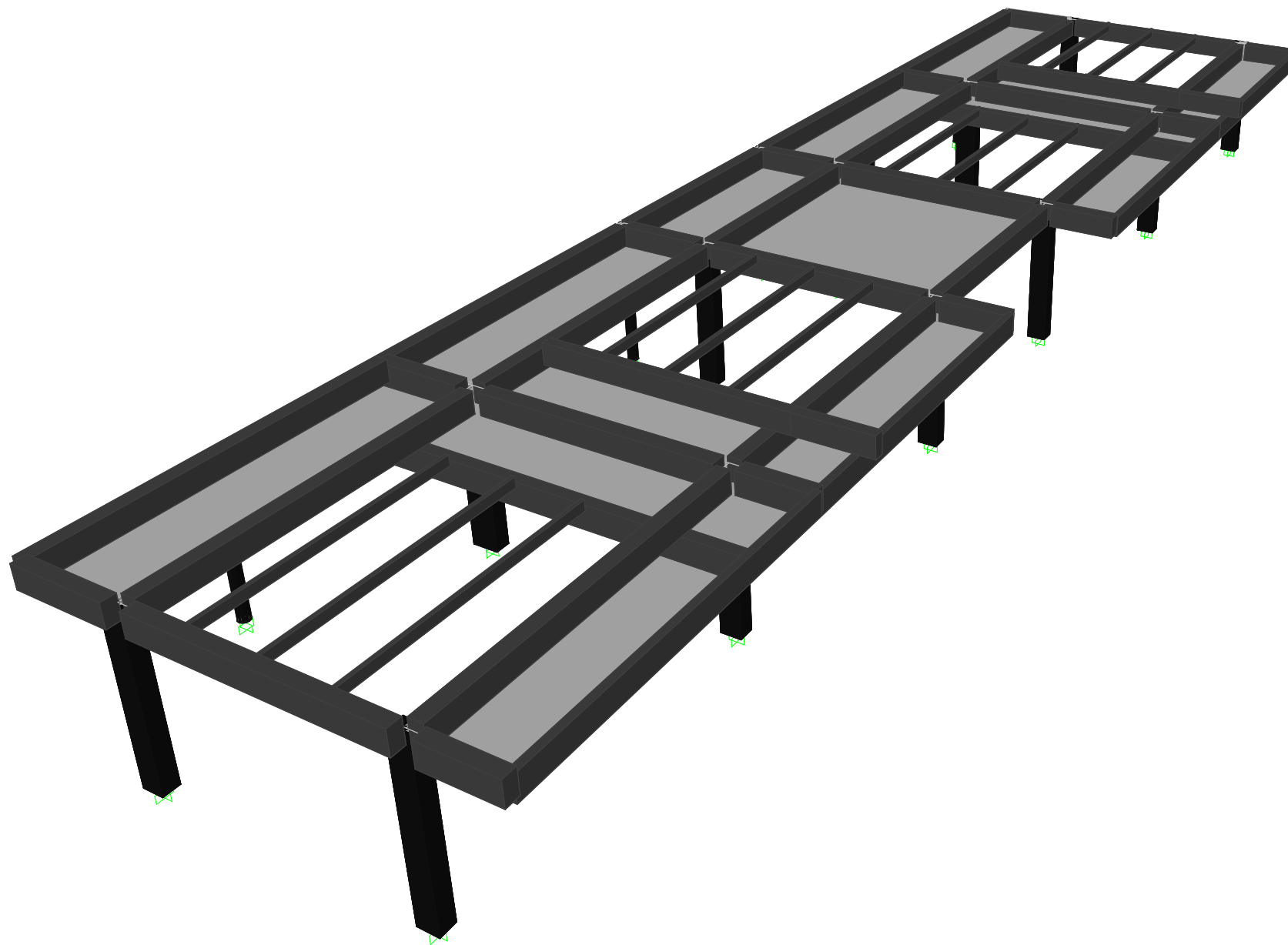
7. REACCIONES DE CIMENTACION

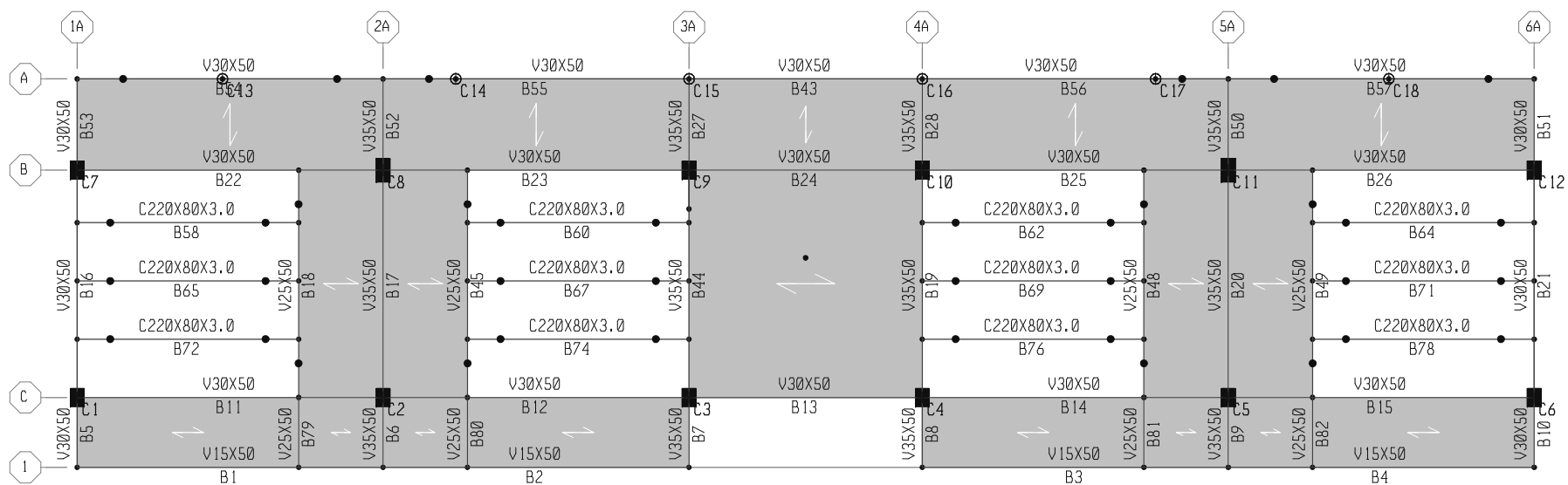
8. DISEÑO DE ELEMENTOS NO ESTRUCTURALES

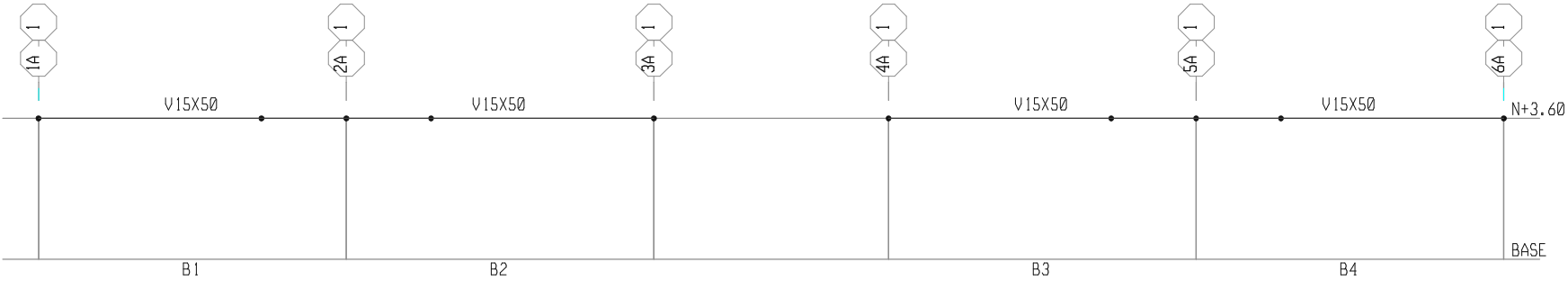


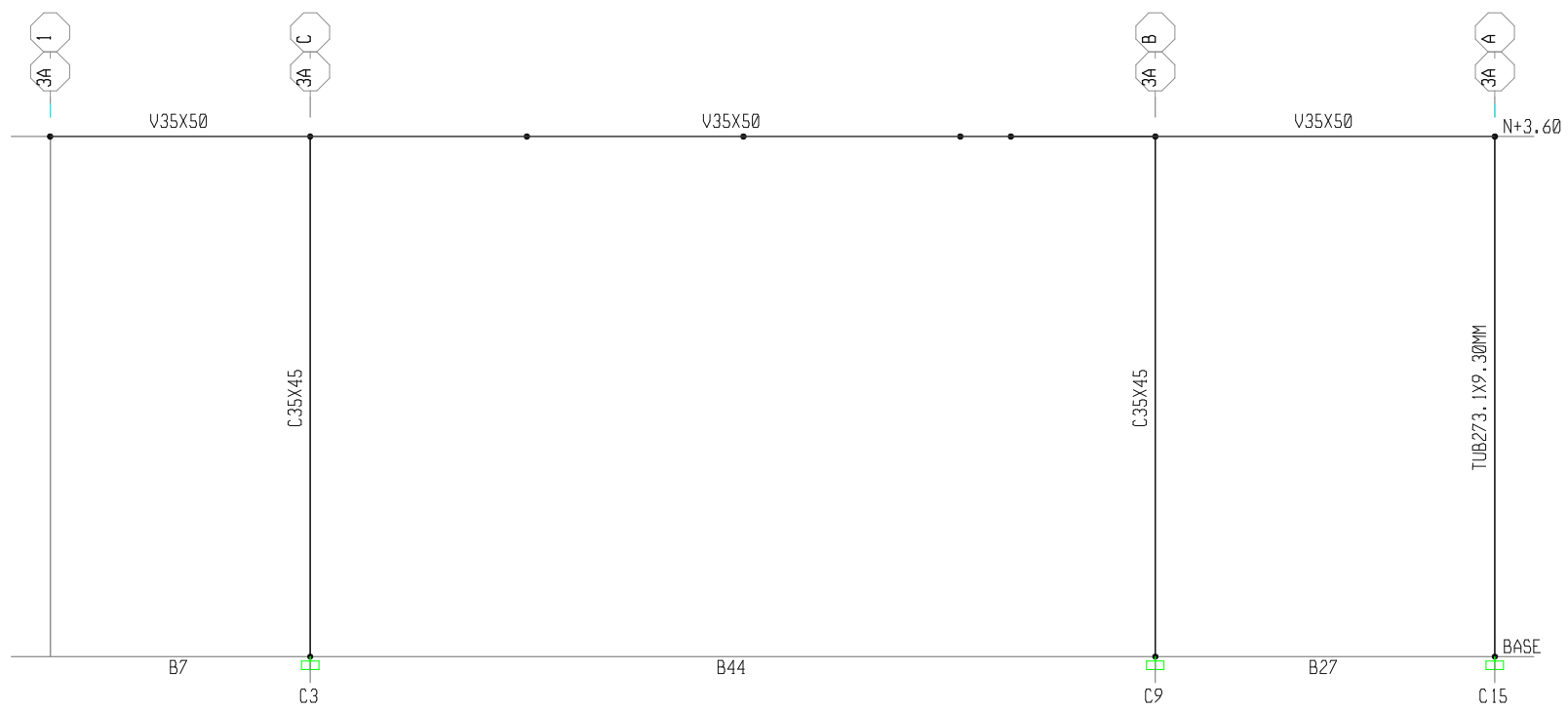
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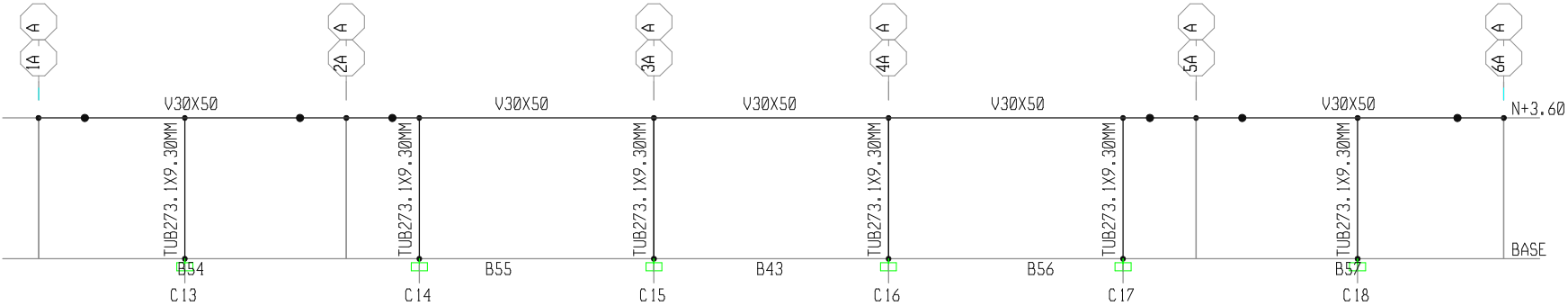
ANEXO 1 . ESQUEMAS DEL MODELO

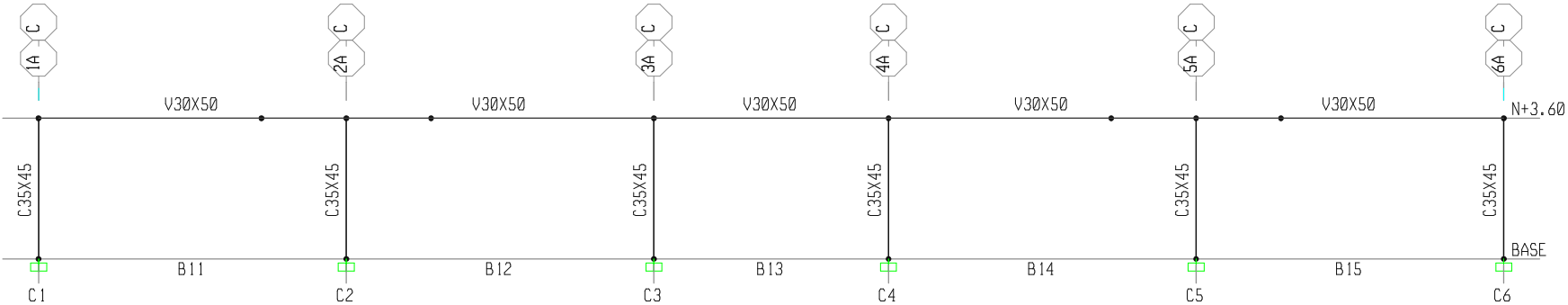














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ANEXO 2 . AVALUO DE CARGAS



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ANEXO 2.1. AVALUO DE CARGAS VERTICALES

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AVALUO DE CARGAS LOSA NORMA NSR-10

PESO DE LA LOSA

T:	50	Cm	(Espesor total de losa)
T_{sup}:	8	Cm	(Espesor Loseta Superior)
T_{inf}:	0	Cm	(Espesor Loseta Superior)
Sep:	97	Cm	(Separacion de Viguetas entre ejes)
t_{vig}:	12	Cm	(Ancho de Vigüeta)
Sep:	300	Cm	(separacion de Riostras)
t_{rios}:	10	Cm	(ancho de Riostra)

Peso Loseta Superior:	192.00	Kg/m²
Peso Loseta Inferior:	0.00	Kg/m²
Peso Viguetas:	124.70	Kg/m²
Peso Riostras:	33.60	Kg/m²
Peso Casetón:	30.00	Kg/m²

Peso Acabados **200.00** **Kg/m²**

Peso Divisiones **150.00** **Kg/m²**

CM:	730	Kg/m²	Total Carga Muerta
	7.30	KN/m²	

CARGAS VIVAS - REF: CAPITULO B-4

CM:	200	Kg/m²	CM:	500	Kg/m²	En losa maciza
	2.0	KN/m²		5.0	KN/m²	

CARGA DE GRANIZO - REF: CAPITULO B-4

CM:	100	Kg/m²	Total Carga de Granizo
	1.0	KN/m²	

FACTORES DE CARGA

Wu:	1.4D	1022.42	Kg/m²
Wu:	1.2D+1.6L+0.5G	1246.36	Kg/m²
Wu:	1.2D+1.6G+1.0L	1236.36	Kg/m²

FC: 1.21

PESO DE MUROS

Altura Libre:	3.00	mt
Ancho del Muro:	12	cm

Peso del muro por metro lineal:	648	kg/m	Muro en Arcilla
	792	kg/m	Muro en Bloque de Concreto



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ANEXO 2.2 ESPECTRO DE DISEÑO

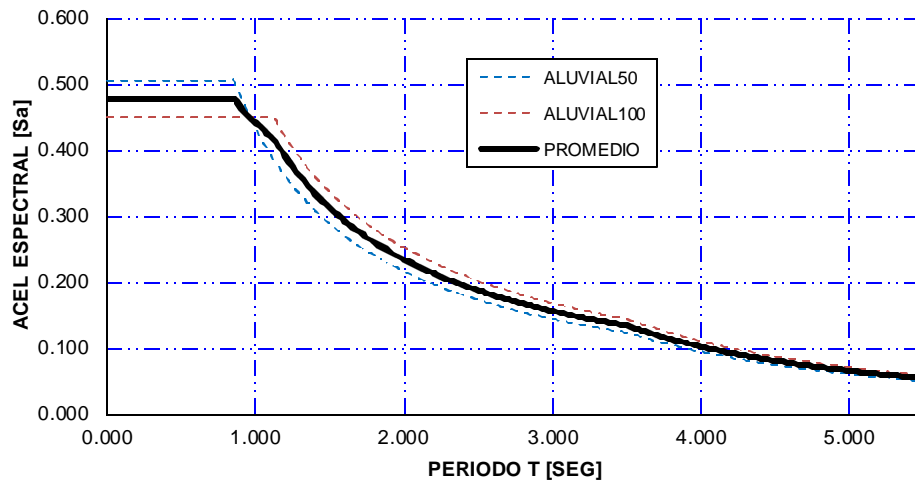


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ESPECTRO DE DISEÑO MICROZONIFICACIÓN SÍSMICA BOGOTA

BOGOTA		ALUVIAL50		ALUVIAL100	
Aa =	0.15	Fa :	1.35	Fa :	1.20
Av =	0.20	Fv :	1.80	Fv :	2.10
		Tc (s):	0.85	Tc (s):	1.12
		TL (s):	3.50	TL (s):	3.50
		Ao (g):	0.20	Ao (g):	0.18
A.6.2.1.2	→	I :	1.00	I :	1.00

ESPECTRO DE DISEÑO



Aceleraciones Espectrales para diferentes Períodos

	T [seg]	Sa [g]
Modo 1:	0.3272	
Modo 2:		
Modo 3:		
Modo 4:		
Modo 5:		
Modo 6:		
Modo 7:		
Modo 8:		
Modo 9:		
Modo 10:		

NOTA: El literal **A.6.2.1.2** permite que al calcular desplazamientos horizontales se use el coeficiente de importancia con un valor igual a la unidad ($I=1.0$).

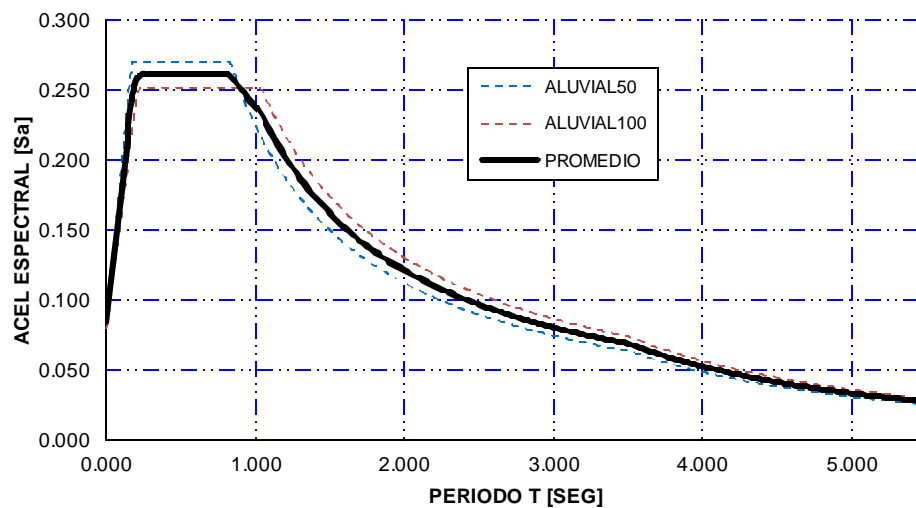


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UMBRAL DE DAÑO MICROZONIFICACIÓN SÍSMICA BOGOTA

BOGOTA		ALUVIAL50	ALUVIAL100
Ae =	0.13	Fa :	1.50
		Fv :	2.50
		Tc (s):	0.83
		TL (s):	3.50
		Ao (g):	0.09
		Fa :	1.40
		Fv :	2.90
		Tc (s):	1.04
		TL (s):	3.50
		Ao (g):	0.08

ESPECTRO PARA UMBRAL DE DAÑO



Aceleraciones Espectrales para diferentes Períodos

	T [seg]	Sa [g]
Modo 1:		
Modo 2:		
Modo 3:		
Modo 4:		
Modo 5:		
Modo 6:		
Modo 7:		
Modo 8:		
Modo 9:		
Modo 10:		



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ANEXO 2.3. REVISION DE IRREGULARIDADES

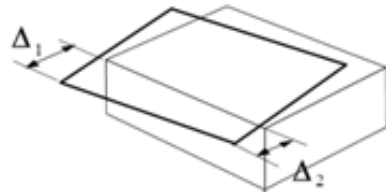


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REVISION DE IRREGULARIDADES NORMA NSR-10

IRREGULARIDADES EN PLANTA, Referencia Tabla A.3-6, Figura A.3-1

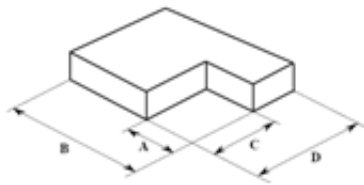
Tipo 1P



Tipo 1aP - Irregularidad Torsional $\phi_p=0.9$
Tipo 1bP - Irregularidad Torsional Extrema $\phi_p=0.8$

Δ_1 : 0.38 % ϕ_p : 1.0
 Δ_2 : 0.31 %

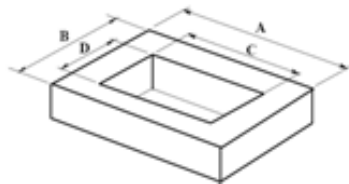
Tipo 2P



Tipo 2P - Retrocesos en las esquinas

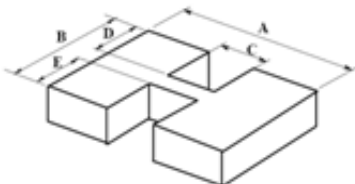
A: m
B: m ϕ_p : 1.0
C: m
D: m

Tipo 3P



Tipo 3P - Irregularidad del diafragma

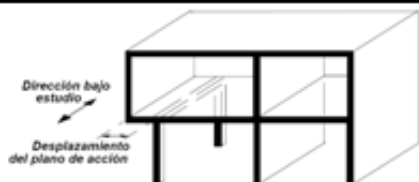
A: m
B: m ϕ_p : 1.0
C: m
D: m



Tipo 3P - Irregularidad del diafragma

A: m
B: m ϕ_p : 1.0
C: m
D: m
E: m

Tipo 4P



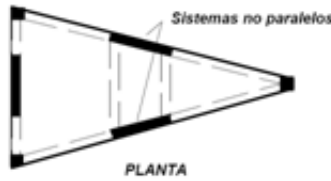
Tipo 4P - Desplazamiento del planos de acción $\phi_p=0.8$

ϕ_p : 1.0



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Tipo 5P

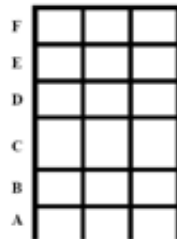


Tipo 5P - Sistemas no paralelos $\phi_p=0.9$

ϕ_p : **1.0**

IRREGULARIDADES EN ALZADA, Referencia Tabla A.3-7, Figura A.3-2

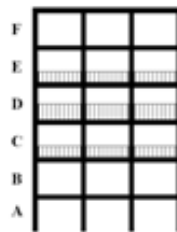
Tipo 1A.



Tipo 1aA - Piso Flexible $\phi_p=0.9$
Tipo 1bA - Piso Flexible Extremo $\phi_p=0.8$

K_C: **ϕ_a :** **1.0**
K_D:
K_E:
K_F:

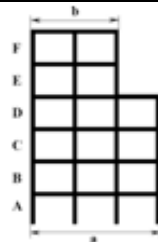
Tipo 2A.



Tipo 2A - Distribucion de Masa $\phi_p=0.9$

M_C: **ϕ_a :** **1.0**
M_D:
M_E:

Tipo 3A.



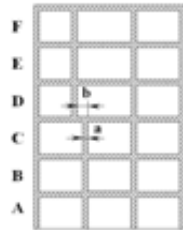
Tipo 3A - Geometrica $\phi_p=0.9$

a: m **ϕ_a :** **1.0**
b: m



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Tipo 4A.

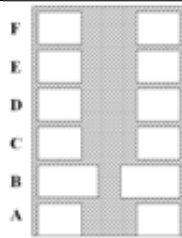


Tipo 4A - Desplazamiento del plano de acción $\phi_a=0.8$

a: m **ϕ_a :**

b: m

Tipo 5A.



Tipo 5aA - Piso Debil $\phi_p=0.9$
 Tipo 5bA - Piso débil Extremo $\phi_p=0.8$

RpB: **ϕ_a :**

RpC:

IRREGULARIDAD POR AUSENCIA DE REDUNDANCIA, Referencia A.3.3.8

ϕ_r :

RESUMEN

ϕ_p :

ϕ_a :

ϕ_r :



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ANEXO 2.4. COMBINACIONES DE CARGA



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COMBINACIONES DE CARGA - SISMO NORMA NSR-10

Ro:	5	$R = R_o * \phi_p * \phi_a * \phi_r =$	3.75
ϕ_p:	1	$E = I * (1/R) * SISMO =$	0.333 * SISMO
ϕ_a:	1		
ϕ_r:	0.75		
I:	1.25	$0.3E = I * (1/R) * SISMO * 0.3 =$	0.100 * SISMO

COMBINACIONES DE CARGA - DISEÑO DE ELEMENTOS

COMBO	D	L	SISMOX	SISMOY
C1:	1.4			
C2:	1.2	1.6		
C3:	1.2	1	0.333	0.100
C4:	1.2	1	0.333	-0.100
C5:	1.2	1	-0.333	0.100
C6:	1.2	1	-0.333	-0.100
C7:	1.2	1	0.100	0.333
C8:	1.2	1	0.100	-0.333
C9:	1.2	1	-0.100	0.333
C10:	1.2	1	-0.100	-0.333
C11:	0.9		0.333	0.100
C12:	0.9		0.333	-0.100
C13:	0.9		-0.333	0.100
C14:	0.9		-0.333	-0.100
C15:	0.9		0.100	0.333
C16:	0.9		0.100	-0.333
C17:	0.9		-0.100	0.333
C18:	0.9		-0.100	-0.333

1.4D
1.2D+1.6L
1.2D+1.0L+1.0E
0.9D+1.0E



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COMBINACIONES DE CARGA - CIMENTACION
NORMA NSR-10

Ro:	5	$R = R_o * \phi_p * \phi_a * \phi_r =$	3.75
ϕ_p:	1		
ϕ_a:	1	$0.7E = 0.7 * I * (1/R) * SISMO =$	0.233 *SISMO
ϕ_r:	0.75		
I:	1.25	$0.75 * 0.7E = 0.75 * 0.7 * I * (1/R) * SISMO =$	0.175 *SISMO

COMBINACIONES DE CARGA - DISEÑO DE ELEMENTOS

COMBO	D	L	SISMOX	SISMOY
CIM1:	1			
CIM2:	1	1		
CIM3:	1		0.233	0.070
CIM4:	1		0.070	0.233
CIM5:	1	0.75	0.175	0.053
CIM6:	1	0.75	0.053	0.175
CIM7:	0.6		0.233	0.070
CIM8:	0.6		0.070	0.233

D
D+L
D+0.7E
D+0.75L+0.75(0.7E)
0.6D+0.7E



Propietario:	SEC. EDUCACION Y SEC. CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

RESISTENCIA AL CORTANTE COLUMNAS
C.21.3.3.2.b - NORMA NSR-10

Ro:	5	$R = R_o * \phi_p * \phi_a * \phi_r =$	3.75
ϕ_p:	1	$\Omega * E = 3 * I * (1/R) * SISMO =$	1.000 * SISMO
ϕ_a:	1		
ϕ_r:	0.75		
I:	1.25	$\Omega * 0.3E = \Omega * I * (1/R) * SISMO * 0.3 =$	0.300 * SISMO

COMBINACIONES DE CARGA - DISEÑO DE ELEMENTOS

COMBO	D	L	SISMOX	SISMOY
VnC:1	1.3	1	1.000	0.300
VnC:2	1.3	1	1.000	-0.300
VnC:3	1.1	1	-1.000	0.300
VnC:4	1.1	1	-1.000	-0.300
VnC:5	1.3	1	0.300	1.000
VnC:6	1.1	1	0.300	-1.000
VnC:7	1.3	1	-0.300	1.000
VnC:8	1.1	1	-0.300	-1.000
VnC:9	1.0		1.000	0.300
VnC:10	1.0		1.000	-0.300
VnC:11	0.8		-1.000	0.300
VnC:12	0.8		-1.000	-0.300
VnC:13	1.0		0.300	1.000
VnC:14	0.8		0.300	-1.000
VnC:15	1.0		-0.300	1.000
VnC:16	0.8		-0.300	-1.000

1.2D+1.0L+ Ω *E
 $\pm 0.5 * A_a * F_a * D$

0.9D+ Ω *E
 $\pm 0.5 * A_a * F_a * D$



Propietario:	SEC. EDUCACION Y SEC. CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

RESISTENCIA AL CORTANTE VIGAS
C.21.3.3.1.b - NORMA NSR-10

Ro:	5	$R = R_o * \phi_p * \phi_a * \phi_r =$	3.75
ϕ_p:	1	$2 * E = 2 * I * (1/R) * SISMO =$	0.667 * SISMO
ϕ_a:	1		
ϕ_r:	0.75		
I:	1.25	$2 * 0.3E = 2 * I * (1/R) * SISMO * 0.3 =$	0.200 * SISMO

COMBINACIONES DE CARGA - DISEÑO DE ELEMENTOS

COMBO	D	L	SISMOX	SISMOY
VnV:1	1.2	1	0.667	0.200
VnV:2	1.2	1	0.667	-0.200
VnV:3	1.2	1	-0.667	0.200
VnV:4	1.2	1	-0.667	-0.200
VnV:5	1.2	1	0.200	0.667
VnV:6	1.2	1	0.200	-0.667
VnV:7	1.2	1	-0.200	0.667
VnV:8	1.2	1	-0.200	-0.667
VnV:9	0.9		0.667	0.200
VnV:10	0.9		0.667	-0.200
VnV:11	0.9		-0.667	0.200
VnV:12	0.9		-0.667	-0.200
VnV:13	0.9		0.200	0.667
VnV:14	0.9		0.200	-0.667
VnV:15	0.9		-0.200	0.667
VnV:16	0.9		-0.200	-0.667

1.2D+1.0L+2*E

0.9D+2*E



Propietario:	SEC. EDUCACION Y SEC. CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

ANEXO 2.5. ANALISIS DE VIENTO

ANÁLISIS DE CARGA DE VIENTO

NSR -10 Edificaciones cerradas con $h \leq 18\text{m}$ y cubiertas con $\theta \leq 45^\circ$

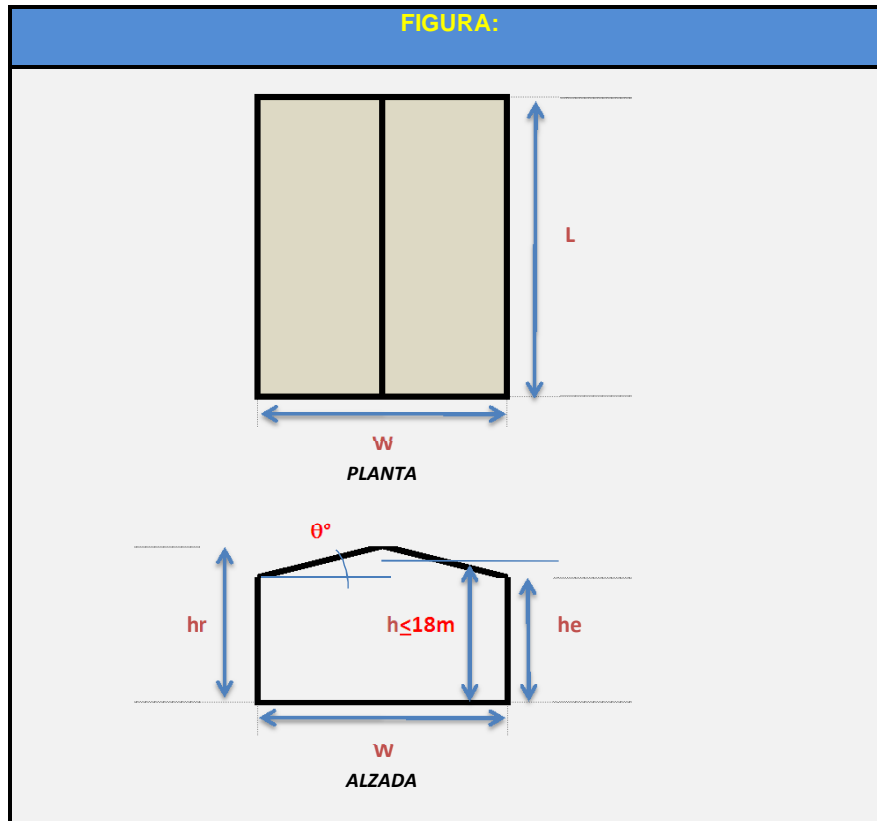
Método 1: Procedimiento simplificado (B.6.4)

proyecto:	Colegio y Teatro El Ensueño	Ingeniero:	Juan Carlos Patiño
Proyecto No.:	2765	Fecha:	Noviembre - 2014

Datos de entrada:

Velocidad del viento, $V =$	22 m/s (80Km/h)	(Figura B.6.4-1)
Factor de Importancia, $I =$	III	(Ver Tabla A.2.5-1 / Según grupo de uso)
Categoría de exposición =	C	(B.6.5.6.3)
Altura de la cumbrera, $h_r =$	3.50	m ($h_r \geq h_e$)
Altura de la cornisa, $h_e =$	3.50	m ($h_e \leq h_r$)
Ancho del edificio, $W =$	10.60	m (Perpendicular a la cumbrera)
Dimension Horizontal del Edificio, $L =$	37.48	m (Paralelo a la cumbrera)
Tipo de cubierta =	plana	(plana - 1 agua - 2 aguas)
Factor topografico, $K_{zt} =$	1.00	(B.6.5.7 Y Figura 6.5-1)
C&R en fachada =	Correas	(correas de fachada, tejas de fachadas o fijaciones)
C&R Area efectiva en fachada =	6.75	m ² (Componentes/revestimientos)
C&R en cubierta =	Correas	(correas de cubierta, tejas de cubiertas o fijaciones)
C&R Area efectiva en cubierta =	12.00	m ² (Componentes/revestimientos)
Area efectiva en aleros =	0.00	m ² (Componentes/revestimientos)
Region propensa a huracanes?	No	

FIGURA:



Parámetros resultantes y presiones netas de diseño

Para la dirección transversal:

(viento perpendicular a la cumbrera)

Angulo de inclinación de la cubierta, $\theta = 0.00^\circ$
 Altura media del edificio, $h = 3.50$ m ($h = h_e$ para $\theta < 10^\circ$)
 Factor de ajuste, $\lambda = 1.210$ (Ajustes por altura y exposición)
 Factor de importancia, $I = 1.15$ (Tabla A.2.5-1)
 $a = 1.060$ m (use: "2*a" para SPRFV, "a" para Componentes y Revestimientos)

Presiones de viento neta Transversales para SPRFV, p_s (KN/m ²)				
Ubicación	Dirección	Zona	Cas. Carg. 1	Cas. Carg. 2
A = Zona final del muro	Horizontal	A	0.26	0.00
B = Zona final de la cubierta	Horizontal	B	-0.14	0.00
C = Zona interior del muro	Horizontal	C	0.17	0.00
D = Zona interior de la cubierta	Horizontal	D	-0.08	0.00
E = Zona final de cubierta a barlovento	Vertical	E	-0.32	0.00
F = Zona final de cubierta a sotavento	Vertical	F	-0.18	0.00
G = Zona interior de cubierta a barlovento	Vertical	G	-0.22	0.00
H = Zona interior de cubierta a sotavento	Vertical	H	-0.14	0.00

$p_s = \lambda * K_{zt} * I * p_{s10}$
 (p_{s10} de la Fig. 6.4-2)

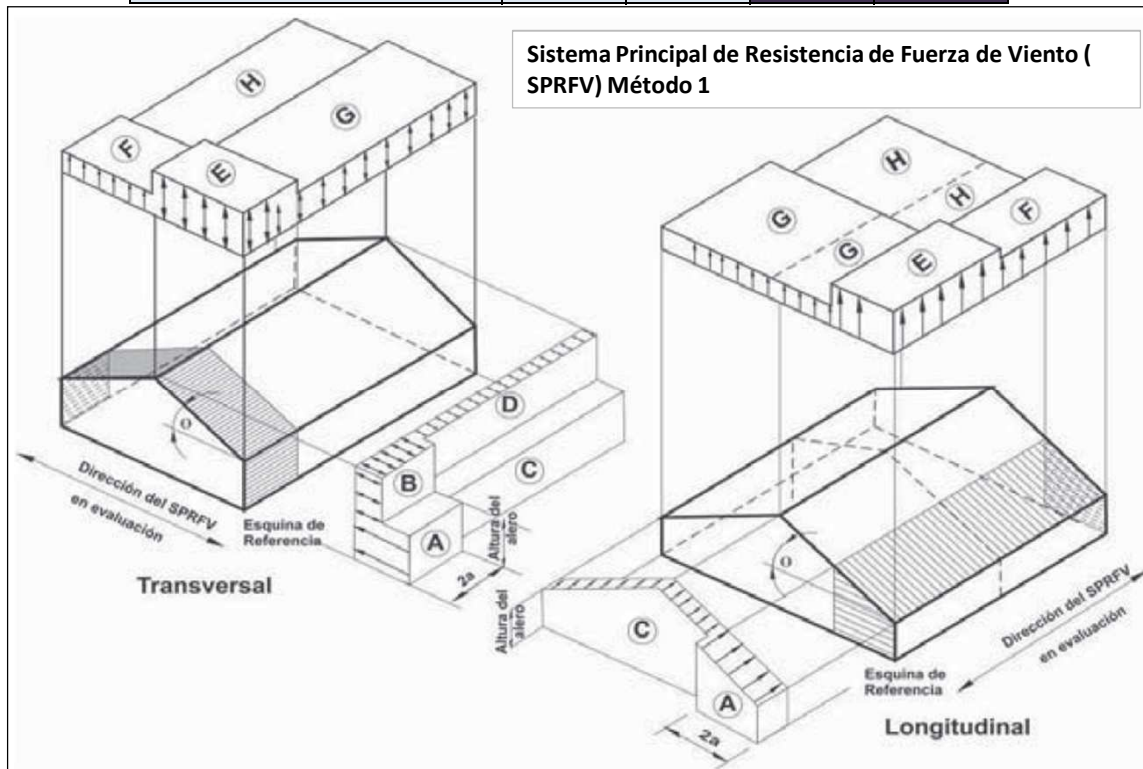
Para la dirección longitudinal:

(viento paralelo a la cubierta)

Angulo de inclinación de la cubierta, $\theta = 0.00^\circ$ (asumido)
 Altura media del edificio, $h = 3.50$ m ($h = (h_r + h_e)/2$)
 Factor de ajuste, $\lambda = 1.210$ (Ajustes por altura y exposición)
 $a = 1.06$ m (use: "2*a" para SPRFV, "a" para Componentes y Revestimientos)

Presiones de viento neta Longitudinales para SPRFV, p_s (KN/m ²)				
Ubicación	Dirección	Zona	Cas. Carg. 1	Cas. Carg. 2
A = Zona final del muro	Horizontal	A	0.26	0.00
B = Zona final de la cubierta	Horizontal	B	0.00	0.00
C = Zona interior del muro	Horizontal	C	0.17	0.00
D = Zona interior de la cubierta	Horizontal	D	0.00	0.00
E = Zona final de cubierta a barlovento	Vertical	E	-0.32	0.00
F = Zona final de cubierta a sotavento	Vertical	F	-0.18	0.00
G = Zona interior de cubierta a barlovento	Vertical	G	-0.22	0.00
H = Zona interior de cubierta a sotavento	Vertical	H	-0.14	0.00

$p_s = \lambda * K_{zt} * I * p_{s10}$
 (p_{s10} de la Fig. 6.4-2)



Parámetros resultantes y presiones netas de diseño

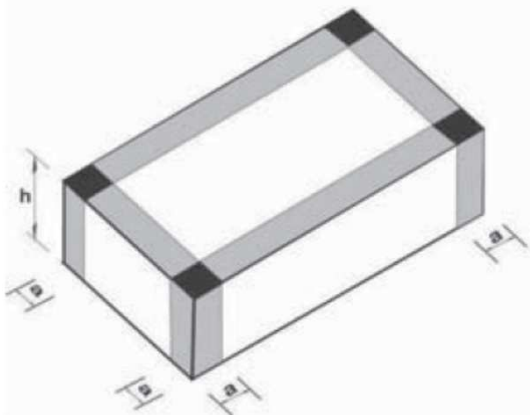
Para componentes y revestimientos: Las presiones calculadas se aplican en la dirección normal a la superficie

Angulo de inclinación de la cubierta, $\theta = 0.00^\circ$
Altura media del edificio, $h = 3.50$ m ($h = (h_r + h_e)/2$)
Factor de ajuste, $\lambda = 1.210$ (Ajustes por altura y exposición)
 $a = 1.06$ m (use: "2*a" para SPRFV, "a" para Componentes y Revestimientos)

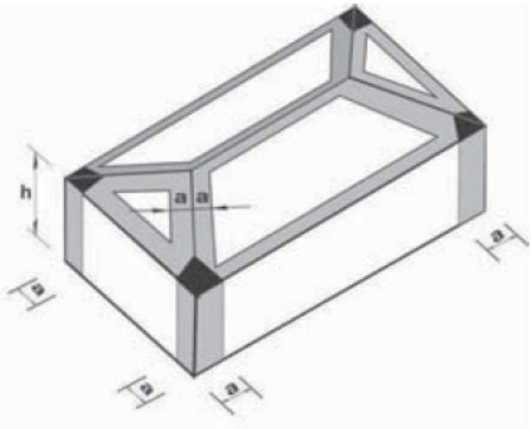
Componentes y Revestimientos Presiones netas de viento de diseño , (KN/m2)				
Item	Localización	Zona	Pos. (+)	Neg. (-)
Fachada - Correas	Zonas interiores Fachadas	4	0.26	-0.29
	Zonas finales Fachadas	5	0.26	-0.32
Cubierta - Correas	Zonas interiores Cubiertas	1	0.10	-0.26
	Zonas finales Cubiertas	2	0.10	-0.32
	Zonas esquineras Cubiertas	3	0.10	-0.32
Alero	Zonas finales Aleros	2	---	0.00
	Zonas esquineras Aleros	3	---	0.00

$p_{net} = \lambda \cdot K_z t \cdot I \cdot p_{net10}$
(p_{net10} de Fig. B.6.4-3)

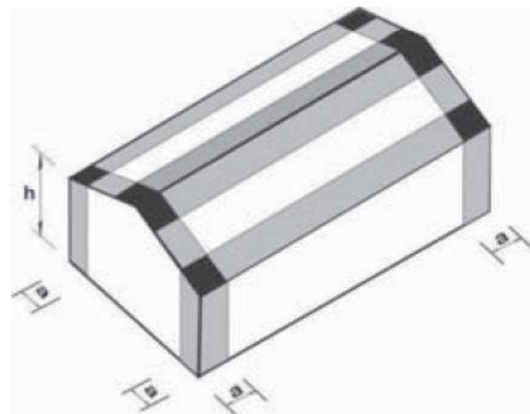
Componentes y Revestimientos – Método 1



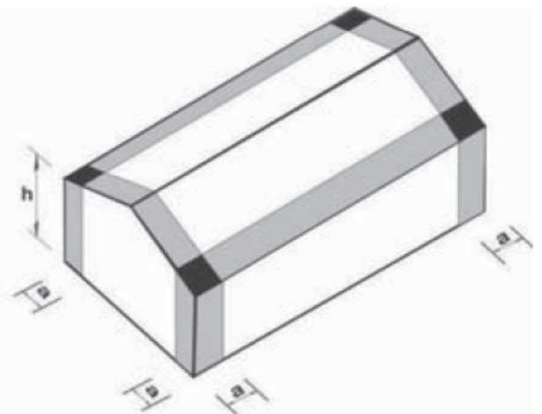
Cubierta Plana



Cubierta a Cuatro Aguas ($7^\circ < \theta \leq 27^\circ$)



Cubierta a Dos Aguas ($\theta \leq 7^\circ$)



Cubierta a Dos Aguas ($7^\circ < \theta \leq 45^\circ$)



Zonas Interiores
Cubiertas – Zona 1
Muros – Zona 4



Zonas Finales
Cubiertas – Zona 2
Muros – Zona 5



Zonas Esquineras
Cubiertas – Zona 3

CONDICIONES DEL PROCEDIMIENTO SIMPLIFICADO (NSR-10):

B.6.4.1.1 — Sistema Principal de Resistencia de Fuerzas de Viento (SPRFV) — Para el diseño del SPRFV el edificio debe cumplir todas las siguientes condiciones:

- (a) El edificio sea de diafragma simple como se define en la sección B.6.2.
- (b) El edificio sea bajo de acuerdo 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 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 $\theta \leq 45^\circ$
- (h) El edificio esta eximido de los casos de carga torsional indicados en la Nota 5 de la fig. B.6.5-7, o estos casos no controlan el diseño de ninguno de los elementos del SPRFV del edificio.

B.6.4.1.2 — Componentes y Revestimientos — Para el diseño de los componentes y elementos de revestimiento, el edificio debe cumplir todas las siguientes condiciones:

- (a) La altura promedio h es igual o menor a 18.0 m.
- (b) El edificio es cerrado como se define en la sección B.6.2 y cumple las provisiones de zonas propensas a huracanes de acuerdo con la sección B.6.5.9.3.
- (c) El edificio es de forma regular como se define en la sección B.6.2.
- (d) El edificio tiene una cubierta plana, una cubierta a dos aguas con $\theta \leq 45^\circ$ o una cubierta a cuatro aguas con $\theta \leq 27^\circ$.

B.6.4.2.1.1 - Presiones Mínimas (SPRFV) - 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 kN/m² para las zonas A, B, C y D y de 0 kN/m² para las zonas E, F, G y H.

B.6.4.2.2.1 — Presiones Mínimas (C&R) - Las presiones de viento de diseño positivas y negativas, P_{net} de la sección B.6.4.2.2 no serán menores a +0.4 kN/m² y -0.4 kN/m², respectivamente.

Referencias:

Capítulo B.6 - NSR 10

ASCE 7-05 Standard, "Minimum Design Loads for Buildings and Other Structures"

Guide to the Use of the Wind Load Provisions of ASCE 7-02



Propietario:	SEC. EDUCACION Y SEC. CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

ANEXO 2.6. AJUSTE DE CORTANTE SISMICA EN LA BASE



Propietario:	SEC. EDUCACION Y SEC. CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	
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AJUSTE DE CORTANTE SISMICA EN LA BASE

1. Calculo del periodo aproximado según A.4.2.2 $T_a = C_t h^\alpha$

Tabla A.4.2-1

Valor de los parámetros C_t y α para el cálculo del periodo aproximado T_a

Sistema estructural de resistencia sísmica	C_t	α
Pórticos resistentes a momentos de concreto reforzado que resisten la totalidad de las fuerzas sísmicas y que no están limitados o adheridos a componentes más rígidos, estructurales o no estructurales, que limiten los desplazamientos horizontales al verse sometidos a las fuerzas sísmicas.	0.047	0.9
Pórticos resistentes a momentos de acero estructural que resisten la totalidad de las fuerzas sísmicas y que no están limitados o adheridos a componentes más rígidos, estructurales o no estructurales, que limiten los desplazamientos horizontales al verse sometidos a las fuerzas sísmicas.	0.072	0.8
Pórticos arriostrados de acero estructural con diagonales excéntricas restringidas a pandeo.	0.073	0.75
Todos los otros sistemas estructurales basados en muros de rigidez similar o mayor a la de muros de concreto o mampostería	0.049	0.75
Alternativamente, para estructuras que tengan muros estructurales de concreto reforzado o mampostería estructural, pueden emplearse los siguientes parámetros C_t y α , donde C_w se calcula utilizando la ecuación A.4.2-4.	$\frac{0.0062}{\sqrt{C_w}}$	1.00

Ct:	0.047
h:	3.5
α:	0.9

Coficiente para el calcular el periodo de la estructura
altura en metros, medida desde la base, del piso mas alto del edificio
Exponente del periodo aproximado

Ta: 0.145 Seg

2. Valor de la aceleración espectral (ver anexo Espectro de Diseño)

Sa: 0.478 g

3. Valor del exponente k

Valores de entrada - Etabs	Sa:	0.48
	k:	1.00

k: 1.00 Seg

4. Valor del periodo máximo de la estructura (Análisis Dinámico)

$T < C_u T_a$ T: periodo de la estructura del análisis dinámico

$C_u = 1.75 - 1.2 A_v F_v > 1.2$

Av:	0.2
Fv:	1.95

Cu: 1.28 **CuTa:** 0.19



Propietario:	SEC. EDUCACION Y SEC. CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	
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T1: 0.3261 Seg Período Fundamental del análisis dinámico (Etabs)

T2: 0.2776 Seg Período Fundamental del análisis dinámico (Etabs)

Sa: 0.478 g

5. Cortantes Sísmicas en la Base

Vu: 134.92 Ton Cortante Basal según FHE (Etabs)

0.8Vu: 107.936 Ton

Edificio Regular

0.9Vu: 121.428 Ton

Edificio Irregular

6. Ajuste de resultados (gravedad)

Vux: 134.13 Ton

Vuy: 134.83 Ton

Edificio Regular

Edificio Irregular

gx: 9.80

gx: 9.80

gy: 9.80

gy: 9.80

	Story	Load	Loc	P	VX	VY	T	MX	MY
▶	N+3.60	FHE	Top	0.00	-134.92	0.00	696.491	0.000	0.000
	N+3.60	FHE	Bottom	0.00	-134.92	0.00	696.491	0.000	-485.723
	N+3.60	SSMOX	Top	0.00	134.13	0.00	665.752	0.000	0.000
	N+3.60	SSMOX	Bottom	0.00	134.13	0.00	665.752	0.000	482.662
	N+3.60	SSMOY	Top	0.00	0.00	134.83	2768.827	0.000	0.000
	N+3.60	SSMOY	Bottom	0.00	0.00	134.83	2768.827	485.393	0.000

FUENTE: Modelacion en Etabs



Propietario:	SEC. EDUCACION Y SEC. CULTURA	Calculó:	ING. FABIO RIVERA
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Contenido:	MODULO II - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

ANEXO 2.7. RESUMEN DE CARGAS SISMICAS



Propietario: SEC. EDUCACION Y SEC. CULTURA

Calculó: ING. FABIO RIVERA

Proyecto: COLEGIO Y TEATRO EL ENSUEÑO

Revisó: ING. JUAN C. PATIÑO

Localización: BOGOTA - CUNDINAMARCA

Hoja:

Contenido: MODULO II - M. DE CALCULOS

Fecha: NOVIEMBRE - 2014

FUENTE DE MASA

Tipo de carga % de participacion

Muerta 100%
Viva 10%


MASA POR PISO

Nivel Masa (Ton/g)
N+3.60 27.58


FUERZAS SISMICAS POR PISO (Ton, m)

NIVEL	CARGA	P	VX	VY	T	MX	MY
N+3.60	FHE	3.99E-14	-1.45E+02	-6.20E-13	8.02E+02	2.65E-12	-5.20E+02
N+3.60	FHEU	1.63E-14	-7.89E+01	-3.38E-13	4.38E+02	1.42E-12	-2.84E+02
N+3.60	SISMOX	4.89E-14	1.44E+02	3.40E+00	8.13E+02	1.22E+01	5.19E+02
N+3.60	SISMOY	2.74E-13	3.57E+00	1.30E+02	3.12E+03	4.69E+02	1.28E+01
N+3.60	UMBRALX	2.79E-14	7.87E+01	2.39E+00	4.30E+02	8.59E+00	2.83E+02
N+3.60	UMBRALY	1.68E-13	2.83E+00	7.11E+01	1.85E+03	2.56E+02	1.02E+01

NOTA: El analisis se hace por el metodo dinamico con el ajuste de cortante en la base.

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 1 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

ANEXO 3. DATOS DE ENTRADA

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 2 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

ETABS v9.7.3 File:MODULO01 Units:Ton-m Noviembre 5, 2014 10:12 PAGE 1

STORY DATA

STORY	SIMILAR TO	HEIGHT	ELEVATION
N+3.60	None	3.600	3.600
BASE	None		0.000

ETABS v9.7.3 File:MODULO01 Units:Ton-m Noviembre 5, 2014 10:12 PAGE 2

MASS SOURCE DATA

MASS	LATERAL	LUMP MASS
FROM	MASS ONLY	AT STORIES

Loads Yes Yes

MASS SOURCE LOADS

LOAD	MULTIPLIER
DEAD	1.0000
LIVE	0.1000

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DIAPHRAGM MASS DATA

STORY	DIAPHRAGM	MASS-X	MASS-Y	MMI	X-M	Y-M
N+3.60	D1	2.758E+01	2.758E+01	3.735E+03	18.740	5.393

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ASSEMBLED POINT MASSES

STORY	POINT	UX	UY	UZ	RX	RY	RZ
N+3.60	93	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	94	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	95	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	96	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	97	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	98	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	99	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	100	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	101	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	102	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	103	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	104	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	105	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	106	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	107	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	108	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	109	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	110	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	111	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	112	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	113	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	114	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	115	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	116	2.554E-03	2.554E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	121	2.861E-01	2.861E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	122	2.861E-01	2.861E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	123	2.861E-01	2.861E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	124	2.861E-01	2.861E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	134	2.758E+01	2.758E+01	0.000E+00	0.000E+00	0.000E+00	3.735E+03

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 3 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

BASE	7	6.947E-02	6.947E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	8	6.947E-02	6.947E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	9	6.947E-02	6.947E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	10	6.947E-02	6.947E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	11	6.947E-02	6.947E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	12	6.947E-02	6.947E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	13	6.947E-02	6.947E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	14	9.262E-02	9.262E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	15	6.947E-02	6.947E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	16	6.947E-02	6.947E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	17	9.262E-02	9.262E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	18	6.947E-02	6.947E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	20	1.108E-02	1.108E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	22	1.108E-02	1.108E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	23	1.108E-02	1.108E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	24	1.108E-02	1.108E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	25	1.108E-02	1.108E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BASE	27	1.108E-02	1.108E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	All	2.878E+01	2.878E+01	0.000E+00	0.000E+00	0.000E+00	3.735E+03
BASE	All	9.464E-01	9.464E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Totals	All	2.973E+01	2.973E+01	0.000E+00	0.000E+00	0.000E+00	3.735E+03

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M A T E R I A L L I S T B Y E L E M E N T T Y P E

ELEMENT TYPE	MATERIAL	TOTAL MASS tons	NUMBER PIECES	NUMBER STUDS
Column	STEEL	1.30	6	
Column	CONC	17.26	12	
Beam	STEEL	0.60	12	0
Beam	CONC	75.56	45	0
Floor	CONC	73.11		
Metal Deck	N.A.	1.60		

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M A T E R I A L L I S T B Y S E C T I O N

SECTION	ELEMENT TYPE	NUMBER PIECES	TOTAL LENGTH meters	TOTAL MASS tons	NUMBER STUDS
C35X60	Column	2	7.200	3.63	
V30X50	Beam	21	132.440	45.63	0
V35X50	Beam	12	40.000	15.07	0
V25X50	Beam	8	30.600	9.19	0
V15X50	Beam	4	31.480	5.67	0
TUB273.1X9.	Column	6	21.600	1.30	
C35X45	Column	10	36.000	13.63	
C220X80X3.0	Beam	12	68.400	0.60	0
LOSA50	Floor			47.71	
LOSA50	Metal Deck			1.60	
LOSA12	Floor			25.40	

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M A T E R I A L L I S T B Y S T O R Y

STORY	ELEMENT TYPE	MATERIAL	TOTAL WEIGHT tons	FLOOR AREA m2	UNIT WEIGHT kg/m2	NUMBER PIECES	NUMBER STUDS
N+3.60	Column	STEEL	1.30	230.620	5.6548	6	
N+3.60	Column	CONC	17.26	230.620	74.8346	12	
N+3.60	Beam	STEEL	0.60	230.620	2.6068	12	0
N+3.60	Beam	CONC	75.56	230.620	327.6464	45	0

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	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 4 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	Floor	CONC	73.11	230.620	317.0166		
N+3.60	Metal Deck	N.A.	1.60	230.620	6.9225		
SUM	Column	STEEL	1.30	230.620	5.6548	6	
SUM	Column	CONC	17.26	230.620	74.8346	12	
SUM	Beam	STEEL	0.60	230.620	2.6068	12	0
SUM	Beam	CONC	75.56	230.620	327.6464	45	0
SUM	Floor	CONC	73.11	230.620	317.0166		
SUM	Metal Deck	N.A.	1.60	230.620	6.9225		
TOTAL	All	All	169.43	230.620	734.6816	75	0

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

MATERIAL NAME	MATERIAL TYPE	DESIGN TYPE	MATERIAL DIR/PLANE	MODULUS OF ELASTICITY	POISSON'S RATIO	THERMAL COEFF	SHEAR MODULUS
STEEL	Iso	Steel	All	20389020.000	0.3000	1.1700E-05	7841930.769
CONC	Iso	Concrete	All	2526710.000	0.2000	9.9000E-06	1052795.833
OTHER	Iso	None	All	20389020.000	0.3000	1.1700E-05	7841930.769

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	7.9814E-01	7.8334E+00
CONC	2.4480E-01	2.4030E+00
OTHER	7.9814E-01	7.8334E+00

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

MATERIAL NAME	STEEL FY	STEEL FU	STEEL COST (\$)
STEEL	35153.480	45699.530	27679.91

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	2800.000	42000.000	42000.000	N/A


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

FRAME SECTION NAME	MATERIAL NAME	SECTION SHAPE NAME OR NAME IN SECTION DATABASE FILE	CONC COL	CONC BEAM
C35X60	CONC	Rectangular	Yes	
V30X50	CONC	Rectangular		Yes
V35X50	CONC	Rectangular		Yes
V25X50	CONC	Rectangular		Yes
V15X50	CONC	Rectangular		Yes
TUB273.1X9.30MM	STEEL	Pipe		
C35X45	CONC	Rectangular	Yes	
C220X80X3.0	STEEL	Channel		

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

SECTION FLANGE FLANGE WEB FLANGE FLANGE

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	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 5 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

FRAME SECTION NAME	DEPTH	WIDTH TOP	THICK TOP	THICK	WIDTH BOT	THICK BOT
C35X60	0.6000	0.3500	0.0000	0.0000	0.3000	0.0000
V30X50	0.5000	0.3000	0.0000	0.0000	0.3000	0.0000
V35X50	0.5000	0.3500	0.0000	0.0000	0.3500	0.0000
V25X50	0.5000	0.2500	0.0000	0.0000	0.2500	0.0000
V15X50	0.5000	0.1500	0.0000	0.0000	0.1500	0.0000
TUB273.1X9.30MM	0.2731	0.2731	0.0093	0.0093	0.2731	0.0000
C35X45	0.4500	0.3500	0.0000	0.0000	0.3000	0.0000
C220X80X3.0	0.2200	0.0800	0.0030	0.0030	0.0000	0.0000

FRAME SECTION PROPERTY DATA

FRAME SECTION NAME	SECTION AREA	TORSIONAL CONSTANT	MOMENTS OF INERTIA		SHEAR AREAS	
			I33	I22	A2	A3
C35X60	0.2100	0.0055	0.0063	0.0021	0.1750	0.1750
V30X50	0.1500	0.0028	0.0031	0.0011	0.1250	0.1250
V35X50	0.1750	0.0041	0.0036	0.0018	0.1458	0.1458
V25X50	0.1250	0.0018	0.0026	0.0007	0.1042	0.1042
V15X50	0.0750	0.0005	0.0016	0.0001	0.0625	0.0625
TUB273.1X9.30MM	0.0077	0.0001	0.0001	0.0001	0.0041	0.0041
C35X45	0.1575	0.0034	0.0027	0.0016	0.1313	0.1313
C220X80X3.0	0.0011	0.0000	0.0000	0.0000	0.0007	0.0005

FRAME SECTION PROPERTY DATA

FRAME SECTION NAME	SECTION MODULI		PLASTIC MODULI		RADIUS OF GYRATION	
	S33	S22	Z33	Z22	R33	R22
C35X60	0.0210	0.0123	0.0315	0.0184	0.1732	0.1010
V30X50	0.0125	0.0075	0.0188	0.0113	0.1443	0.0866
V35X50	0.0146	0.0102	0.0219	0.0153	0.1443	0.1010
V25X50	0.0104	0.0052	0.0156	0.0078	0.1443	0.0722
V15X50	0.0063	0.0019	0.0094	0.0028	0.1443	0.0433
TUB273.1X9.30MM	0.0005	0.0005	0.0006	0.0006	0.0933	0.0933
C35X45	0.0118	0.0092	0.0177	0.0138	0.1299	0.1010
C220X80X3.0	0.0001	0.0000	0.0001	0.0000	0.0850	0.0243


FRAME SECTION WEIGHTS AND MASSES

FRAME SECTION NAME	TOTAL WEIGHT	TOTAL MASS
C35X60	3.6333	0.3701
V30X50	45.6307	4.6485
V35X50	15.0661	1.5348
V25X50	9.1915	0.9364
V15X50	5.6735	0.5780
TUB273.1X9.30MM	1.3041	0.1329
C35X45	13.6250	1.3880
C220X80X3.0	0.6012	0.0613

CONCRETE COLUMN DATA

FRAME SECTION NAME	REINF CONFIGURATION		REINF SIZE/TYPE	NUM BARS 3DIR/2DIR	NUM BARS CIRCULAR	BAR COVER
	LONGIT	LATERAL				
C35X60	Rectangular	Ties	#7/Design	3/4	N/A	0.0500
C35X45	Rectangular	Ties	#7/Design	3/4	N/A	0.0400

CONCRETE BEAM DATA

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	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 6 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

FRAME SECTION NAME	TOP COVER	BOT COVER	TOP LEFT AREA	TOP RIGHT AREA	BOT LEFT AREA	BOT RIGHT AREA
V30X50	0.0500	0.0500	0.000	0.000	0.000	0.000
V35X50	0.0500	0.0500	0.000	0.000	0.000	0.000
V25X50	0.0500	0.0500	0.000	0.000	0.000	0.000
V15X50	0.0500	0.0500	0.000	0.000	0.000	0.000

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DECK SECTION PROPERTY DATA

DECK SECTION	DECK TYPE	SLAB MATERIAL	DECK MATERIAL	DECK SHEAR THICK	DECK UNIT WT
LOSA50	Filled	CONC	N/A	N/A	1.1200E-02
LOSA12	Solid	CONC	N/A	N/A	N/A

DECK SECTION SHEAR STUD DATA

DECK SECTION	STUD DIAM	STUD HEIGHT	STUD FU
LOSA50	0.0191	0.1524	45699.530
LOSA12	0.0191	0.1524	45699.530

DECK SECTION GEOMETRY DATA

DECK SECTION	SLAB DEPTH	RIB DEPTH	RIB WIDTH	RIB SPACING
LOSA50	0.0800	0.4200	0.1200	0.8500
LOSA12	0.1200	N/A	N/A	N/A

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STATIC LOAD CASES

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		
FHE	QUAKE	USER_COEFF	0.0000		
FHEU	QUAKE	USER_COEFF	0.0000		
VIENTO	WIND	None	0.0000		

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RESPONSE SPECTRUM CASES


RESP SPEC CASE: SISMOX

BASIC RESPONSE SPECTRUM DATA

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

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	MICROBOG	9.8000

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	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 7 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

U2 ---- N/A
UZ ---- N/A

RESP SPEC CASE: SISMOY

BASIC RESPONSE SPECTRUM DATA

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

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	MICROBOG	9.8000
UZ	----	N/A

RESP SPEC CASE: UMBRALX

BASIC RESPONSE SPECTRUM DATA

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

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	UMBMICROBOG	9.8000
U2	----	N/A
UZ	----	N/A

RESP SPEC CASE: UMBRALY

BASIC RESPONSE SPECTRUM DATA

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

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	UMBMICROBOG	9.8000
UZ	----	N/A

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

COMBO	COMBO TYPE	CASE	CASE TYPE	SCALE FACTOR
C1	ADD	DEAD	Static	1.4000
C2	ADD	DEAD	Static	1.2000



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Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 8 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

C3	ADD	LIVE	Static	1.6000
		DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	0.3330
C4	ADD	SISMOY	Spectra	0.1000
		DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	0.3330
C5	ADD	SISMOY	Spectra	-0.1000
		DEAD	Static	1.2000
		SISMOX	Spectra	-0.3330
		SISMOY	Spectra	0.1000
C6	ADD	LIVE	Static	1.0000
		DEAD	Static	1.2000
		SISMOX	Spectra	-0.3330
		SISMOY	Spectra	-0.1000
C7	ADD	LIVE	Static	1.0000
		DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	0.1000
C8	ADD	SISMOY	Spectra	0.3330
		DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	-0.1000
C9	ADD	SISMOY	Spectra	0.3330
		DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	0.1000
C10	ADD	SISMOY	Spectra	-0.3330
		DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	-0.1000
C11	ADD	SISMOY	Spectra	-0.3330
		DEAD	Static	0.9000
		SISMOX	Spectra	0.3330
		SISMOY	Spectra	0.1000
C12	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	0.3330
		SISMOY	Spectra	-0.1000
		DEAD	Static	0.9000
C13	ADD	SISMOX	Spectra	-0.3330
		SISMOY	Spectra	0.1000
		DEAD	Static	0.9000
		SISMOX	Spectra	-0.1000
C14	ADD	SISMOY	Spectra	0.9000
		DEAD	Static	0.9000
		SISMOX	Spectra	-0.3330
		SISMOY	Spectra	-0.1000
C15	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	0.1000
		SISMOY	Spectra	0.3330
		DEAD	Static	0.9000
C16	ADD	SISMOX	Spectra	0.1000
		SISMOY	Spectra	-0.3330
		DEAD	Static	0.9000
		SISMOY	Spectra	-0.1000
C17	ADD	SISMOY	Spectra	0.3330
		DEAD	Static	0.9000
		SISMOX	Spectra	-0.1000
		SISMOY	Spectra	0.3330
C18	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-0.1000
		SISMOY	Spectra	-0.3330
		C1	Combo	1.0000
ENVC	ENVE	C2	Combo	1.0000
		C3	Combo	1.0000
		C4	Combo	1.0000
		C5	Combo	1.0000
		C6	Combo	1.0000
		C7	Combo	1.0000
		C8	Combo	1.0000
		C9	Combo	1.0000
		C10	Combo	1.0000
		C11	Combo	1.0000
		C12	Combo	1.0000




Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 9 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

		C13	Combo	1.0000
		C14	Combo	1.0000
		C15	Combo	1.0000
		C16	Combo	1.0000
		C17	Combo	1.0000
		C18	Combo	1.0000
F1	ADD	DEAD	Static	1.0000
F2	ADD	DEAD	Static	1.0000
		LIVE	Static	1.0000
F3	ADD	DEAD	Static	1.0000
		SISMOX	Spectra	0.2330
		SISMOY	Spectra	0.0700
F4	ADD	DEAD	Static	1.0000
		SISMOX	Spectra	0.0700
		SISMOY	Spectra	0.2330
F5	ADD	DEAD	Static	1.0000
		SISMOX	Spectra	0.1750
		SISMOY	Spectra	0.0530
		LIVE	Static	0.7500
F6	ADD	DEAD	Static	1.0000
		SISMOX	Spectra	0.0530
		SISMOY	Spectra	0.1750
		LIVE	Static	0.7500
F7	ADD	DEAD	Static	0.6000
		SISMOX	Spectra	0.2330
		SISMOY	Spectra	0.0700
F8	ADD	DEAD	Static	0.6000
		SISMOX	Spectra	0.0700
		SISMOY	Spectra	0.2330
ENVF	ENVE	F1	Combo	1.0000
		F2	Combo	1.0000
		F3	Combo	1.0000
		F4	Combo	1.0000
		F5	Combo	1.0000
		F6	Combo	1.0000
		F7	Combo	1.0000
		F8	Combo	1.0000
VNC1	ADD	DEAD	Static	1.3000
		LIVE	Static	1.0000
		SISMOX	Spectra	1.0000
		SISMOY	Spectra	0.3000
VNC2	ADD	DEAD	Static	1.3000
		LIVE	Static	1.0000
		SISMOX	Spectra	1.0000
		SISMOY	Spectra	-0.3000
VNC3	ADD	DEAD	Static	1.1000
		LIVE	Static	1.0000
		SISMOX	Spectra	-1.0000
		SISMOY	Spectra	0.3000
VNC4	ADD	DEAD	Static	1.1000
		LIVE	Static	1.0000
		SISMOX	Spectra	-1.0000
		SISMOY	Spectra	-0.3000
VNC5	ADD	DEAD	Static	1.3000
		LIVE	Static	1.0000
		SISMOX	Spectra	0.3000
		SISMOY	Spectra	1.0000
VNC6	ADD	DEAD	Static	1.1000
		LIVE	Static	1.0000
		SISMOX	Spectra	0.3000
		SISMOY	Spectra	-1.0000
VNC7	ADD	DEAD	Static	1.3000
		LIVE	Static	1.0000
		SISMOX	Spectra	-0.3000
		SISMOY	Spectra	1.0000
VNC8	ADD	DEAD	Static	1.1000
		LIVE	Static	1.0000
		SISMOX	Spectra	-0.3000
		SISMOY	Spectra	-1.0000




Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 10 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

VNC9	ADD	DEAD	Static	1.0000
		SISMOX	Spectra	1.0000
		SISMOY	Spectra	0.3000
VNC10	ADD	DEAD	Static	1.0000
		SISMOX	Spectra	1.0000
		SISMOY	Spectra	-0.3000
VNC11	ADD	DEAD	Static	0.8000
		SISMOX	Spectra	-1.0000
		SISMOY	Spectra	0.3000
VNC12	ADD	DEAD	Static	0.8000
		SISMOX	Spectra	-1.0000
		SISMOY	Spectra	-0.3000
VNC13	ADD	DEAD	Static	1.0000
		SISMOX	Spectra	0.3000
		SISMOY	Spectra	1.0000
VNC14	ADD	DEAD	Static	0.8000
		SISMOX	Spectra	0.3000
		SISMOY	Spectra	-1.0000
VNC15	ADD	DEAD	Static	1.0000
		SISMOX	Spectra	-0.3000
		SISMOY	Spectra	1.0000
VNC16	ADD	DEAD	Static	0.8000
		SISMOX	Spectra	-0.3000
		SISMOY	Spectra	-1.0000
VNV1	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	0.6670
		SISMOY	Spectra	0.2000
VNV2	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	0.6670
		SISMOY	Spectra	-0.2000
VNV3	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	-0.6670
		SISMOY	Spectra	0.2000
VNV4	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	-0.6670
		SISMOY	Spectra	-0.2000
VNV5	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	0.2000
		SISMOY	Spectra	0.6670
VNV6	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	0.2000
		SISMOY	Spectra	-0.6670
VNV7	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	-0.2000
		SISMOY	Spectra	0.6670
VNV8	ADD	DEAD	Static	1.2000
		LIVE	Static	1.0000
		SISMOX	Spectra	-0.2000
		SISMOY	Spectra	-0.6670
VNV9	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	0.6670
		SISMOY	Spectra	0.2000
VNV10	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	0.6670
		SISMOY	Spectra	-0.2000
VNV11	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-0.6670
		SISMOY	Spectra	0.2000
VNV12	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-0.6670
		SISMOY	Spectra	-0.2000
VNV13	ADD	DEAD	Static	0.9000

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 11 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

		SISMOX	Spectra	0.2000
		SISMOY	Spectra	0.6670
VNV14	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	0.2000
		SISMOY	Spectra	-0.6670
VNV15	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-0.2000
		SISMOY	Spectra	0.6670
VNV16	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-0.2000
		SISMOY	Spectra	-0.6670
DU1	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	1.0000
		UMBRALY	Spectra	0.3000
DU2	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	1.0000
		UMBRALY	Spectra	-0.3000
DU3	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	-1.0000
		UMBRALY	Spectra	0.3000
DU4	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	-1.0000
		UMBRALY	Spectra	-0.3000
DU5	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	0.3000
		UMBRALY	Spectra	1.0000
DU6	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	0.3000
		UMBRALY	Spectra	-1.0000
DU7	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	-0.3000
		UMBRALY	Spectra	1.0000
DU8	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	-0.3000
		UMBRALY	Spectra	-1.0000
D1	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	1.0000
		SISMOY	Spectra	0.3000
D2	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	1.0000
		SISMOY	Spectra	-0.3000
D3	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-1.0000
		SISMOY	Spectra	0.3000
D4	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-1.0000
		SISMOY	Spectra	-0.3000
D5	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	0.3000
		SISMOY	Spectra	1.0000
D6	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	0.3000
		SISMOY	Spectra	-1.0000
D7	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-0.3000
		SISMOY	Spectra	1.0000
D8	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-0.3000
		SISMOY	Spectra	-1.0000
DWAL1	ADD	DEAD	Static	1.4000
DWAL2	ADD	DEAD	Static	1.4000
		LIVE	Static	1.7000
DWAL3	ADD	DEAD	Static	1.0500
		LIVE	Static	1.2750
		VIENTO	Static	1.2750
DWAL4	ADD	DEAD	Static	1.0500
		LIVE	Static	1.2750
		VIENTO	Static	-1.2750
DWAL5	ADD	DEAD	Static	1.0500

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 12 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

DWAL6	ADD	VIENTO	Static	1.2750
		DEAD	Static	1.0500
		VIENTO	Static	-1.2750
DWAL7	ADD	DEAD	Static	0.9000
		VIENTO	Static	1.3000
DWAL8	ADD	DEAD	Static	0.9000
		VIENTO	Static	-1.3000
DWAL9	ADD	DEAD	Static	1.5400
		LIVE	Static	0.5500
		FHE	Static	1.6500
DWAL10	ADD	DEAD	Static	1.5400
		LIVE	Static	0.5500
		FHE	Static	-1.6500
DWAL11	ADD	DEAD	Static	1.5400
		LIVE	Static	0.5500
		FHEU	Static	1.6500
DWAL12	ADD	DEAD	Static	1.5400
		LIVE	Static	0.5500
		FHEU	Static	-1.6500
DWAL13	ADD	DEAD	Static	1.5400
		FHE	Static	1.6500
DWAL14	ADD	DEAD	Static	1.5400
		FHE	Static	-1.6500
DWAL15	ADD	DEAD	Static	1.5400
		FHEU	Static	1.6500
DWAL16	ADD	DEAD	Static	1.5400
		FHEU	Static	-1.6500
DWAL17	ADD	DEAD	Static	0.7700
		FHE	Static	1.6500
DWAL18	ADD	DEAD	Static	0.7700
		FHE	Static	-1.6500
DWAL19	ADD	DEAD	Static	0.7700
		FHEU	Static	1.6500
DWAL20	ADD	DEAD	Static	0.7700
		FHEU	Static	-1.6500
DWAL21	ADD	DEAD	Static	1.5400
		LIVE	Static	0.5500
		SISMOX	Spectra	1.6500
DWAL22	ADD	DEAD	Static	1.5400
		LIVE	Static	0.5500
		SISMOY	Spectra	1.6500
DWAL23	ADD	DEAD	Static	1.5400
		LIVE	Static	0.5500
		UMBRALX	Spectra	1.6500
DWAL24	ADD	DEAD	Static	1.5400
		LIVE	Static	0.5500
		UMBRALY	Spectra	1.6500
DWAL25	ADD	DEAD	Static	0.7700
		SISMOX	Spectra	1.6500
DWAL26	ADD	DEAD	Static	0.7700
		SISMOY	Spectra	1.6500
DWAL27	ADD	DEAD	Static	0.7700
		UMBRALX	Spectra	1.6500
DWAL28	ADD	DEAD	Static	0.7700
		UMBRALY	Spectra	1.6500

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

FUNCTION NAME: MICROBOG

PERIOD	ACCEL
0.0000	0.4780
0.0250	0.4780
0.0500	0.4780
0.0750	0.4780
0.1000	0.4780



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 13 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

0.1250	0.4780
0.1500	0.4780
0.1750	0.4780
0.2000	0.4780
0.2250	0.4780
0.2500	0.4780
0.2750	0.4780
0.3000	0.4780
0.3250	0.4780
0.3500	0.4780
0.3750	0.4780
0.4000	0.4780
0.4250	0.4780
0.4500	0.4780
0.4750	0.4780
0.5000	0.4780
0.5250	0.4780
0.5500	0.4780
0.5750	0.4780
0.6500	0.4780
0.6750	0.4780
0.7000	0.4780
0.7250	0.4780
0.7500	0.4780
0.7750	0.4780
0.8000	0.4780
0.8250	0.4780
0.8500	0.4780
0.8750	0.4720
0.9000	0.4650
0.9250	0.4590
0.9500	0.4520
0.9750	0.4470
1.0000	0.4410
1.0250	0.4360
1.0500	0.4310
1.0750	0.4260
1.1000	0.4210
1.1250	0.4160
1.1500	0.4070
1.1750	0.3980
1.2000	0.3900
1.2250	0.3820
1.2500	0.3740
1.2750	0.3670
1.3000	0.3600
1.3250	0.3530
1.3500	0.3470
1.3750	0.3400
1.4000	0.3340
1.4250	0.3280
1.4500	0.3230
1.4750	0.3170
1.5000	0.3120
1.5250	0.3070
1.5500	0.3020
1.5750	0.2970
1.6000	0.2930
1.6250	0.2880
1.6500	0.2840
1.6750	0.2790
1.7000	0.2750
1.7250	0.2710
1.7500	0.2670
1.7750	0.2640
1.8000	0.2600
1.8250	0.2560
1.8500	0.2530
1.8750	0.2500




Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 14 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

1.9000	0.2460
1.9250	0.2430
1.9500	0.2400
1.9750	0.2370
2.0000	0.2340
2.0250	0.2310
2.0500	0.2280
2.0750	0.2260
2.1000	0.2230
2.1250	0.2200
2.1500	0.2180
2.1750	0.2150
2.2000	0.2130
2.2250	0.2100
2.2500	0.2080
2.2750	0.2060
2.3000	0.2030
2.3250	0.2010
2.3500	0.1990
2.3750	0.1970
2.4000	0.1950
2.4250	0.1930
2.4500	0.1910
2.4750	0.1890
2.5000	0.1870
2.5250	0.1850
2.5500	0.1840
2.5750	0.1820
2.6000	0.1800
2.6250	0.1780
2.6500	0.1770
2.6750	0.1750
2.7000	0.1730
2.7250	0.1720
2.7500	0.1700
2.7750	0.1690
2.8000	0.1670
2.8250	0.1660
2.8500	0.1640
2.8750	0.1630
2.9000	0.1610
2.9250	0.1600
2.9500	0.1590
2.9750	0.1570
3.0000	0.1560
3.0250	0.1550
3.0500	0.1530
3.0750	0.1520
3.1000	0.1510
3.1250	0.1500
3.1500	0.1490
3.1750	0.1470
3.2000	0.1460
3.2250	0.1450
3.2500	0.1440
3.2750	0.1430
3.3000	0.1420
3.3250	0.1410
3.3500	0.1400
3.3750	0.1390
3.4000	0.1380
3.4250	0.1370
3.4500	0.1360
3.4750	0.1350
3.5000	0.1340
3.5250	0.1320
3.5500	0.1300
3.5750	0.1280
3.6000	0.1260



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 15 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

3.6250	0.1250
3.6500	0.1230
3.6750	0.1210
3.7000	0.1200
3.7250	0.1180
3.7500	0.1160
3.7750	0.1150
3.8000	0.1130
3.8250	0.1120
3.8500	0.1110
3.8750	0.1090
3.9000	0.1080
3.9250	0.1060
3.9500	0.1050
3.9750	0.1040
4.0000	0.1020
4.0250	0.1010
4.0500	0.1000
4.0750	0.0990
4.1000	0.0970
4.1250	0.0960
4.1500	0.0950
4.1750	0.0940
4.2000	0.0930
4.2250	0.0920
4.2500	0.0910
4.2750	0.0900
4.3000	0.0890
4.3250	0.0880
4.3500	0.0870
4.3750	0.0860
4.4000	0.0850
4.4250	0.0840
4.4500	0.0830
4.4750	0.0820
4.5000	0.0810
4.5250	0.0800
4.5500	0.0790
4.5750	0.0780
4.6000	0.0770
4.6250	0.0770
4.6500	0.0760
4.6750	0.0750
4.7000	0.0740
4.7250	0.0730
4.7500	0.0730
4.7750	0.0720
4.8000	0.0710
4.8250	0.0700
4.8500	0.0700
4.8750	0.0690
4.9000	0.0680
4.9250	0.0680
4.9500	0.0670
4.9750	0.0660
5.0000	0.0660
5.0250	0.0650
5.0500	0.0640
5.0750	0.0640
5.1000	0.0630
5.1250	0.0620
5.1500	0.0620
5.1750	0.0610
5.2000	0.0610
5.2250	0.0600
5.2500	0.0590
5.2750	0.0590
5.3000	0.0580
5.3250	0.0580

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 16 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

5.3500	0.0570
5.3750	0.0570
5.4000	0.0560
5.4250	0.0560
5.4500	0.0550
5.4750	0.0550
5.5000	0.0540

FUNCTION NAME: UMBMICROBOG

PERIOD	ACCEL
0.0000	0.2610
0.0250	0.2610
0.0500	0.2610
0.0750	0.2610
0.1000	0.2610
0.1250	0.2610
0.1500	0.2610
0.1750	0.2610
0.2000	0.2610
0.2250	0.2610
0.2500	0.2610
0.2750	0.2610
0.3000	0.2610
0.3250	0.2610
0.3500	0.2610
0.3750	0.2610
0.4000	0.2610
0.4250	0.2610
0.4500	0.2610
0.4750	0.2610
0.5000	0.2610
0.5250	0.2610
0.5500	0.2610
0.5750	0.2610
0.6000	0.2610
0.6250	0.2610
0.6500	0.2610
0.6750	0.2610
0.7000	0.2610
0.7250	0.2610
0.7500	0.2610
0.7750	0.2610
0.8000	0.2610
0.8250	0.2610
0.8500	0.2580
0.8750	0.2550
0.9000	0.2510
0.9250	0.2480
0.9500	0.2440
0.9750	0.2410
1.0000	0.2390
1.0250	0.2360
1.0500	0.2310
1.0750	0.2260
1.1000	0.2210
1.1250	0.2160
1.1500	0.2110
1.1750	0.2070
1.2000	0.2030
1.2250	0.1980
1.2500	0.1940
1.2750	0.1910
1.3000	0.1870
1.3250	0.1830
1.3500	0.1800
1.3750	0.1770



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 17 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

1.4000	0.1740
1.4250	0.1710
1.4500	0.1680
1.4750	0.1650
1.5000	0.1620
1.5250	0.1590
1.5500	0.1570
1.5750	0.1540
1.6000	0.1520
1.6250	0.1500
1.6500	0.1470
1.6750	0.1450
1.7000	0.1430
1.7250	0.1410
1.7500	0.1390
1.7750	0.1370
1.8000	0.1350
1.8250	0.1330
1.8500	0.1310
1.8750	0.1300
1.9000	0.1280
1.9250	0.1260
1.9500	0.1250
1.9750	0.1230
2.0000	0.1220
2.0250	0.1200
2.0500	0.1190
2.0750	0.1170
2.1000	0.1160
2.1250	0.1140
2.1500	0.1130
2.1750	0.1120
2.2000	0.1100
2.2250	0.1090
2.2500	0.1080
2.2750	0.1070
2.3000	0.1060
2.3250	0.1050
2.3500	0.1030
2.3750	0.1020
2.4000	0.1010
2.4250	0.1000
2.4500	0.0990
2.4750	0.0980
2.5000	0.0970
2.5250	0.0960
2.5500	0.0950
2.5750	0.0940
2.6000	0.0930
2.6250	0.0930
2.6500	0.0920
2.6750	0.0910
2.7000	0.0900
2.7250	0.0890
2.7500	0.0880
2.7750	0.0880
2.8000	0.0870
2.8250	0.0860
2.8500	0.0850
2.8750	0.0850
2.9000	0.0840
2.9250	0.0830
2.9500	0.0820
2.9750	0.0820
3.0000	0.0810
3.0250	0.0800
3.0500	0.0800
3.0750	0.0790
3.1000	0.0780




Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 18 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

3.1250	0.0780
3.1500	0.0770
3.1750	0.0770
3.2000	0.0760
3.2250	0.0750
3.2500	0.0750
3.2750	0.0740
3.3000	0.0740
3.3250	0.0730
3.3500	0.0730
3.3750	0.0720
3.4000	0.0710
3.4250	0.0710
3.4500	0.0700
3.4750	0.0700
3.5000	0.0690
3.5250	0.0680
3.5500	0.0670
3.5750	0.0670
3.6000	0.0660
3.6250	0.0650
3.6500	0.0640
3.6750	0.0630
3.7000	0.0620
3.7250	0.0610
3.7500	0.0600
3.7750	0.0600
3.8000	0.0590
3.8250	0.0580
3.8500	0.0570
3.8750	0.0570
3.9000	0.0560
3.9250	0.0550
3.9500	0.0550
3.9750	0.0540
4.0000	0.0530
4.0250	0.0520
4.0500	0.0520
4.0750	0.0510
4.1000	0.0510
4.1250	0.0500
4.1500	0.0490
4.1750	0.0490
4.2000	0.0480
4.2250	0.0480
4.2500	0.0470
4.2750	0.0470
4.3000	0.0460
4.3250	0.0450
4.3500	0.0450
4.3750	0.0440
4.4000	0.0440
4.4250	0.0430
4.4500	0.0430
4.4750	0.0420
4.5000	0.0420
4.5250	0.0420
4.5500	0.0410
4.5750	0.0410
4.6000	0.0400
4.6250	0.0400
4.6500	0.0390
4.6750	0.0390
4.7000	0.0390
4.7250	0.0380
4.7500	0.0380
4.7750	0.0370
4.8000	0.0370
4.8250	0.0370




Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 19 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

4.8500	0.0360
4.8750	0.0360
4.9000	0.0350
4.9250	0.0350
4.9500	0.0350
4.9750	0.0340
5.0000	0.0340
5.0250	0.0340
5.0500	0.0330
5.0750	0.0330
5.1000	0.0330
5.1250	0.0320
5.1500	0.0320
5.1750	0.0320
5.2000	0.0310
5.2250	0.0310
5.2500	0.0310
5.2750	0.0310
5.3000	0.0300
5.3250	0.0300
5.3500	0.0300
5.3750	0.0290
5.4000	0.0290
5.4250	0.0290
5.4500	0.0290
5.4750	0.0280
5.5000	0.0280

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 20 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

ANEXO 4. ANALISIS ESTRUCTURAL

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 21 DE 64
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PROJECT INFORMATION

Company Name = Solarte y Cia Ingenieros Calculistas

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S T O R Y D A T A

STORY	SIMILAR TO	HEIGHT	ELEVATION
N+3.60	None	3.600	3.600
BASE	None		0.000

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

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

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

RESP SPEC CASE: SISMOX

BASIC RESPONSE SPECTRUM DATA

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

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	MICROBOG	9.8000
U2	----	N/A
UZ	----	N/A


RESP SPEC CASE: SISMOY

BASIC RESPONSE SPECTRUM DATA

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

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	MICROBOG	10.2800
UZ	----	N/A

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
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	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 22 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

RESP SPEC CASE: UMBRALX

BASIC RESPONSE SPECTRUM DATA

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

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	UMBMICROBOG	9.8000
U2	----	N/A
UZ	----	N/A

RESP SPEC CASE: UMBRALY

BASIC RESPONSE SPECTRUM DATA

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

RESPONSE SPECTRUM FUNCTION ASSIGNMENT DATA

DIRECTION	FUNCTION	SCALE FACT
U1	----	N/A
U2	UMBMICROBOG	11.6400
UZ	----	N/A

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MASS SOURCE DATA

MASS FROM LATERAL MASS ONLY LUMP MASS AT STORIES

Loads Yes Yes

MASS SOURCE LOADS


LOAD MULTIPLIER

DEAD 1.0000
LIVE 0.1000

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DIAPHRAGM MASS DATA

STORY	DIAPHRAGM	MASS-X	MASS-Y	MMI	X-M	Y-M
N+3.60	D1	3.049E+01	3.049E+01	4.507E+03	19.960	5.497

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	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 23 DE 64
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ASSEMBLED POINT MASSES

STORY	UX	UY	UZ	RX	RY	RZ
N+3.60	3.082E+01	3.082E+01	0.000E+00	0.000E+00	0.000E+00	4.507E+03
BASE	9.464E-01	9.464E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Totals	3.177E+01	3.177E+01	0.000E+00	0.000E+00	0.000E+00	4.507E+03

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CENTERS OF CUMULATIVE MASS & CENTERS OF RIGIDITY

STORY	DIAPHRAGM	/-----CENTER OF MASS-----//--CENTER OF RIGIDITY--/			
LEVEL	NAME	MASS	ORDINATE-X	ORDINATE-Y	ORDINATE-X
N+3.60	D1	3.049E+01	19.960	5.497	18.630

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MODAL PERIODS AND FREQUENCIES

MODE NUMBER	PERIOD (TIME)	FREQUENCY (CYCLES/TIME)	CIRCULAR FREQ (RADIAN/TIME)
Mode 1	0.32147	3.11067	19.54491
Mode 2	0.27582	3.62556	22.78004
Mode 3	0.24749	4.04050	25.38719
Mode 4	0.00264	378.46854	2377.98795
Mode 5	0.00264	379.39867	2383.83215
Mode 6	0.00261	383.55146	2409.92492
Mode 7	0.00260	385.04197	2419.29003
Mode 8	0.00153	651.73882	4094.99580
Mode 9	0.00153	651.94891	4096.31584
Mode 10	0.00153	654.99331	4115.44433
Mode 11	0.00153	655.71341	4119.96883

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MODAL PARTICIPATING MASS RATIOS

MODE NUMBER	X-TRANS %MASS <SUM>	Y-TRANS %MASS <SUM>	Z-TRANS %MASS <SUM>	RX-ROTN %MASS <SUM>	RY-ROTN %MASS <SUM>	RZ-ROTN %MASS <SUM>
Mode 1	99.84 <100>	0.02 < 0>	0.00 < 0>	0.02 < 0>	99.84 <100>	0.14 < 0>
Mode 2	0.11 <100>	59.96 < 60>	0.00 < 0>	59.96 < 60>	0.11 <100>	40.21 < 40>
Mode 3	0.04 <100>	40.02 <100>	0.00 < 0>	40.02 <100>	0.04 <100>	59.65 <100>
Mode 4	0.00 <100>	0.00 <100>	0.00 < 0>	0.00 <100>	0.00 <100>	0.00 <100>
Mode 5	0.00 <100>	0.00 <100>	0.00 < 0>	0.00 <100>	0.00 <100>	0.00 <100>
Mode 6	0.00 <100>	0.00 <100>	0.00 < 0>	0.00 <100>	0.00 <100>	0.00 <100>
Mode 7	0.00 <100>	0.00 <100>	0.00 < 0>	0.00 <100>	0.00 <100>	0.00 <100>
Mode 8	0.00 <100>	0.00 <100>	0.00 < 0>	0.00 <100>	0.00 <100>	0.00 <100>
Mode 9	0.00 <100>	0.00 <100>	0.00 < 0>	0.00 <100>	0.00 <100>	0.00 <100>
Mode 10	0.00 <100>	0.00 <100>	0.00 < 0>	0.00 <100>	0.00 <100>	0.00 <100>
Mode 11	0.00 <100>	0.00 <100>	0.00 < 0>	0.00 <100>	0.00 <100>	0.00 <100>

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MODAL LOAD PARTICIPATION RATIOS (STATIC AND DYNAMIC RATIOS ARE IN PERCENT)

TYPE	NAME	STATIC	DYNAMIC
Load	DEAD	0.2552	0.0000
Load	LIVE	0.3051	0.0000
Load	FHE	100.0000	100.0000
Load	FHEU	100.0000	100.0000
Load	VIENTO	0.0000	0.0000

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	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 24 DE 64
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Accel	UX	100.0000	100.0000
Accel	UY	100.0000	100.0000
Accel	UZ	0.0000	0.0000
Accel	RX	100.0000	100.0000
Accel	RY	100.0000	100.0000
Accel	RZ	85.1929	100.0000

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TOTAL REACTIVE FORCES (RECOVERED LOADS) AT ORIGIN

LOAD	FX	FY	FZ	MX	MY	MZ
DEAD	1.620E-13	-7.372E-14	3.052E+02	1.681E+03	-6.080E+03	-3.003E-12
LIVE	5.636E-14	4.424E-14	1.073E+02	7.069E+02	-2.044E+03	-9.870E-13
FHE	-1.445E+02	-6.198E-13	3.993E-14	2.646E-12	-5.201E+02	8.020E+02
FHEU	-7.888E+01	-3.384E-13	1.631E-14	1.416E-12	-2.840E+02	4.379E+02
VIENTO	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SISMOX	1.442E+02	3.399E+00	4.886E-14	1.224E+01	5.191E+02	8.126E+02
SISMOY	3.566E+00	1.303E+02	2.735E-13	4.690E+02	1.284E+01	3.121E+03
UMBRALX	7.871E+01	2.385E+00	2.785E-14	8.585E+00	2.834E+02	4.304E+02
UMBRALY	2.832E+00	7.113E+01	1.675E-13	2.561E+02	1.020E+01	1.854E+03

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S T O R Y F O R C E S

STORY	LOAD	P	VX	VY	T	MX	MY
N+3.60	FHE	3.993E-14	-1.445E+02	-6.198E-13	8.020E+02	2.646E-12	-5.201E+02
N+3.60	FHEU	1.631E-14	-7.888E+01	-3.384E-13	4.379E+02	1.416E-12	-2.840E+02
N+3.60	VIENTO	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
N+3.60	SISMOX	4.886E-14	1.442E+02	3.399E+00	8.126E+02	1.224E+01	5.191E+02
N+3.60	SISMOY	2.735E-13	3.566E+00	1.303E+02	3.121E+03	4.690E+02	1.284E+01
N+3.60	UMBRALX	2.785E-14	7.871E+01	2.385E+00	4.304E+02	8.585E+00	2.834E+02
N+3.60	UMBRALY	1.675E-13	2.832E+00	7.113E+01	1.854E+03	2.561E+02	1.020E+01

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STORY DRIFTS

STORY	DIRECTION	LOAD	MAX DRIFT
N+3.60	X	FHE	1/292
N+3.60	X	FHEU	1/536
N+3.60	X	SISMOX	1/288
N+3.60	Y	SISMOY	1/273
N+3.60	X	UMBRALX	1/528
N+3.60	Y	UMBRALY	1/422

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DISPLACEMENTS AT DIAPHRAGM CENTER OF MASS


STORY	DIAPHRAGM	LOAD	UX	UY	RZ
N+3.60	D1	FHE	0.0123	0.0000	0.00001
N+3.60	D1	FHEU	0.0067	0.0000	0.00001
N+3.60	D1	VIENTO	0.0000	0.0000	0.00000
N+3.60	D1	SISMOX	0.0123	0.0003	0.00007
N+3.60	D1	SISMOY	0.0002	0.0077	0.00045
N+3.60	D1	UMBRALX	0.0067	0.0002	0.00004
N+3.60	D1	UMBRALY	0.0002	0.0042	0.00033

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	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 25 DE 64
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STORY MAXIMUM AND AVERAGE LATERAL DISPLACEMENTS

STORY	LOAD	DIR	MAXIMUM	AVERAGE	RATIO
N+3.60	FHE	X	0.0123	0.0123	1.004
N+3.60	FHEU	X	0.0067	0.0067	1.004
N+3.60	VIENTO	Y	0.0000	0.0000	
N+3.60	SISMOX	X	0.0125	0.0124	1.010
N+3.60	SISMOY	Y	0.0132	0.0103	1.277
N+3.60	UMBRALX	X	0.0068	0.0067	1.012
N+3.60	UMBRALY	Y	0.0085	0.0063	1.357

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 26 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

ANEXO 5. CHEQUEO DE DERIVAS

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 27 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

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

COMBO	COMBO TYPE	CASE	CASE TYPE	SCALE FACTOR
D1	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	1.0000
		SISMOY	Spectra	0.3000
D2	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	1.0000
		SISMOY	Spectra	-0.3000
D3	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-1.0000
		SISMOY	Spectra	0.3000
D4	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-1.0000
		SISMOY	Spectra	-0.3000
D5	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	0.3000
		SISMOY	Spectra	1.0000
D6	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	0.3000
		SISMOY	Spectra	-1.0000
D7	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-0.3000
		SISMOY	Spectra	1.0000
D8	ADD	DEAD	Static	0.9000
		SISMOX	Spectra	-0.3000
		SISMOY	Spectra	-1.0000

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

STORY	DIAPHRAGM	LOAD	POINT	X	Y	UX	UY	RZ
N+3.60	D1	D1 Max	84	19.960	5.497	0.0124	0.0024	0.00020
N+3.60	D1	D1 Min	84	19.960	5.497	-0.0123	-0.0027	-0.00021
N+3.60	D1	D2 Max	84	19.960	5.497	0.0124	0.0024	0.00020
N+3.60	D1	D2 Min	84	19.960	5.497	-0.0123	-0.0027	-0.00021
N+3.60	D1	D3 Max	84	19.960	5.497	0.0124	0.0024	0.00020
N+3.60	D1	D3 Min	84	19.960	5.497	-0.0123	-0.0027	-0.00021
N+3.60	D1	D4 Max	84	19.960	5.497	0.0124	0.0024	0.00020
N+3.60	D1	D4 Min	84	19.960	5.497	-0.0123	-0.0027	-0.00021
N+3.60	D1	D5 Max	84	19.960	5.497	0.0040	0.0076	0.00047
N+3.60	D1	D5 Min	84	19.960	5.497	-0.0039	-0.0079	-0.00048
N+3.60	D1	D6 Max	84	19.960	5.497	0.0040	0.0076	0.00047
N+3.60	D1	D6 Min	84	19.960	5.497	-0.0039	-0.0079	-0.00048
N+3.60	D1	D7 Max	84	19.960	5.497	0.0040	0.0076	0.00047
N+3.60	D1	D7 Min	84	19.960	5.497	-0.0039	-0.0079	-0.00048
N+3.60	D1	D8 Max	84	19.960	5.497	0.0040	0.0076	0.00047
N+3.60	D1	D8 Min	84	19.960	5.497	-0.0039	-0.0079	-0.00048

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S T O R Y D R I F T S

STORY	DIRECTION	LOAD	POINT	X	Y	Z	MAX DRIFT
N+3.60	X	D1	12	37.480	1.800	3.600	0.003612
N+3.60	X	D2	12	37.480	1.800	3.600	0.003612
N+3.60	X	D3	12	37.480	1.800	3.600	0.003612
N+3.60	X	D4	12	37.480	1.800	3.600	0.003612


	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 28 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	Y	D5	18	37.480	7.650	3.600	0.003830
N+3.60	Y	D6	18	37.480	7.650	3.600	0.003830
N+3.60	Y	D7	18	37.480	7.650	3.600	0.003830
N+3.60	Y	D8	18	37.480	7.650	3.600	0.003830

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D I A P H R A G M D R I F T S

STORY	DIAPHRAGM	DIRECTION	LOAD	POINT	X	Y	Z	MAX DRIFT
N+3.60	D1	X	D1	12	37.480	1.800	3.600	0.003612
N+3.60	D1	Y	D1	18	37.480	7.650	3.600	0.001537
N+3.60	D1	X	D2	12	37.480	1.800	3.600	0.003612
N+3.60	D1	Y	D2	18	37.480	7.650	3.600	0.001537
N+3.60	D1	X	D3	12	37.480	1.800	3.600	0.003612
N+3.60	D1	Y	D3	18	37.480	7.650	3.600	0.001537
N+3.60	D1	X	D4	12	37.480	1.800	3.600	0.003612
N+3.60	D1	Y	D4	18	37.480	7.650	3.600	0.001537
N+3.60	D1	X	D5	27	33.740	10.000	3.600	0.001643
N+3.60	D1	Y	D5	18	37.480	7.650	3.600	0.003830
N+3.60	D1	X	D6	27	33.740	10.000	3.600	0.001643
N+3.60	D1	Y	D6	18	37.480	7.650	3.600	0.003830
N+3.60	D1	X	D7	27	33.740	10.000	3.600	0.001643
N+3.60	D1	Y	D7	18	37.480	7.650	3.600	0.003830
N+3.60	D1	X	D8	27	33.740	10.000	3.600	0.001643
N+3.60	D1	Y	D8	18	37.480	7.650	3.600	0.003830

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 29 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

DERIVAS PARA EL UMBRAL DE DAÑO

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LOADING COMBINATIONS

COMBO	COMBO TYPE	CASE	CASE TYPE	SCALE FACTOR
DU1	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	1.0000
		UMBRALY	Spectra	0.3000
DU2	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	1.0000
		UMBRALY	Spectra	-0.3000
DU3	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	-1.0000
		UMBRALY	Spectra	0.3000
DU4	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	-1.0000
		UMBRALY	Spectra	-0.3000
DU5	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	0.3000
		UMBRALY	Spectra	1.0000
DU6	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	0.3000
		UMBRALY	Spectra	-1.0000
DU7	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	-0.3000
		UMBRALY	Spectra	1.0000
DU8	ADD	DEAD	Static	0.9000
		UMBRALX	Spectra	-0.3000
		UMBRALY	Spectra	-1.0000

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DISPLACEMENTS AT DIAPHRAGM CENTER OF MASS

STORY	DIAPHRAGM	LOAD	POINT	X	Y	UX	UY	RZ
N+3.60	D1	DU1 Max	84	19.960	5.497	0.0068	0.0013	0.00014
N+3.60	D1	DU1 Min	84	19.960	5.497	-0.0067	-0.0016	-0.00014
N+3.60	D1	DU2 Max	84	19.960	5.497	0.0068	0.0013	0.00014
N+3.60	D1	DU2 Min	84	19.960	5.497	-0.0067	-0.0016	-0.00014
N+3.60	D1	DU3 Max	84	19.960	5.497	0.0068	0.0013	0.00014
N+3.60	D1	DU3 Min	84	19.960	5.497	-0.0067	-0.0016	-0.00014
N+3.60	D1	DU4 Max	84	19.960	5.497	0.0068	0.0013	0.00014
N+3.60	D1	DU4 Min	84	19.960	5.497	-0.0067	-0.0016	-0.00014
N+3.60	D1	DU5 Max	84	19.960	5.497	0.0023	0.0041	0.00034
N+3.60	D1	DU5 Min	84	19.960	5.497	-0.0021	-0.0045	-0.00035
N+3.60	D1	DU6 Max	84	19.960	5.497	0.0023	0.0041	0.00034
N+3.60	D1	DU6 Min	84	19.960	5.497	-0.0021	-0.0045	-0.00035
N+3.60	D1	DU7 Max	84	19.960	5.497	0.0023	0.0041	0.00034
N+3.60	D1	DU7 Min	84	19.960	5.497	-0.0021	-0.0045	-0.00035
N+3.60	D1	DU8 Max	84	19.960	5.497	0.0023	0.0041	0.00034
N+3.60	D1	DU8 Min	84	19.960	5.497	-0.0021	-0.0045	-0.00035

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STORY DRIFTS

STORY	DIRECTION	LOAD	POINT	X	Y	Z	MAX DRIFT
N+3.60	X	DU1	27	33.740	10.000	3.600	0.002007
N+3.60	X	DU2	27	33.740	10.000	3.600	0.002007
N+3.60	X	DU3	27	33.740	10.000	3.600	0.002007


	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 30 DE 64
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N+3.60	X	DU4	27	33.740	10.000	3.600	0.002007
N+3.60	Y	DU5	18	37.480	7.650	3.600	0.002492
N+3.60	Y	DU6	18	37.480	7.650	3.600	0.002492
N+3.60	Y	DU7	18	37.480	7.650	3.600	0.002492
N+3.60	Y	DU8	18	37.480	7.650	3.600	0.002492


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D I A P H R A G M D R I F T S


STORY	DIAPHRAGM	DIRECTION	LOAD	POINT	X	Y	Z	MAX DRIFT
N+3.60	D1	X	DU1	27	33.740	10.000	3.600	0.002007
N+3.60	D1	Y	DU1	18	37.480	7.650	3.600	0.000991
N+3.60	D1	X	DU2	27	33.740	10.000	3.600	0.002007
N+3.60	D1	Y	DU2	18	37.480	7.650	3.600	0.000991
N+3.60	D1	X	DU3	27	33.740	10.000	3.600	0.002007
N+3.60	D1	Y	DU3	18	37.480	7.650	3.600	0.000991
N+3.60	D1	X	DU4	27	33.740	10.000	3.600	0.002007
N+3.60	D1	Y	DU4	18	37.480	7.650	3.600	0.000991
N+3.60	D1	X	DU5	27	33.740	10.000	3.600	0.001027
N+3.60	D1	Y	DU5	18	37.480	7.650	3.600	0.002492
N+3.60	D1	X	DU6	27	33.740	10.000	3.600	0.001027
N+3.60	D1	Y	DU6	18	37.480	7.650	3.600	0.002492
N+3.60	D1	X	DU7	27	33.740	10.000	3.600	0.001027
N+3.60	D1	Y	DU7	18	37.480	7.650	3.600	0.002492
N+3.60	D1	X	DU8	27	33.740	10.000	3.600	0.001027
N+3.60	D1	Y	DU8	18	37.480	7.650	3.600	0.002492

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 31 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

ANEXO 6. DISEÑO DE ELEMENTOS ESTRUCTURALES

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 32 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

ANEXO 6.1. DISEÑO DE COLUMNAS

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 33 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

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CONCRETE COLUMN DESIGN OUTPUT (ACI 318-08/IBC 2009)


BIAXIAL P-M INTERACTION AND SHEAR DESIGN OF COLUMN-TYPE ELEMENTS

STORY ID	COLUMN LINE	SECTION ID	STATION ID	<-----REQUIRED REINFORCING----->					
				LONGITUDINAL	COMBO	SHEAR22	COMBO	SHEAR33	COMBO
N+3.60	C1	C35X45	0.000	15.750	C18	0.043	C10	0.071	C6
N+3.60	C1	C35X45	31.000	15.750	C18	0.043	C10	0.071	C6
N+3.60	C1	C35X45	62.000	15.750	C18	0.043	C10	0.071	C6
N+3.60	C1	C35X45	93.000	15.750	C18	0.043	C10	0.071	C6
N+3.60	C1	C35X45	124.000	15.750	C18	0.043	C10	0.071	C6
N+3.60	C1	C35X45	155.000	15.750	C18	0.043	C10	0.071	C6
N+3.60	C1	C35X45	186.000	15.750	C18	0.043	C10	0.071	C6
N+3.60	C1	C35X45	217.000	15.750	C18	0.043	C10	0.071	C6
N+3.60	C1	C35X45	248.000	15.750	C18	0.043	C10	0.071	C6
N+3.60	C1	C35X45	279.000	15.750	C18	0.043	C10	0.071	C6
N+3.60	C1	C35X45	310.000	15.750	C18	0.043	C10	0.071	C6
N+3.60	C2	C35X45	0.000	15.750	C18	0.049	C18	0.050	C14
N+3.60	C2	C35X45	31.000	15.750	C18	0.049	C18	0.050	C14
N+3.60	C2	C35X45	62.000	15.750	C18	0.049	C18	0.050	C14
N+3.60	C2	C35X45	93.000	15.750	C18	0.049	C18	0.050	C14
N+3.60	C2	C35X45	124.000	15.750	C18	0.049	C18	0.050	C14
N+3.60	C2	C35X45	155.000	15.750	C18	0.049	C18	0.050	C14
N+3.60	C2	C35X45	186.000	15.750	C18	0.049	C18	0.050	C14
N+3.60	C2	C35X45	217.000	15.750	C18	0.049	C18	0.050	C14
N+3.60	C2	C35X45	248.000	15.750	C18	0.049	C18	0.050	C14
N+3.60	C2	C35X45	279.000	15.750	C18	0.049	C18	0.050	C14
N+3.60	C2	C35X45	310.000	15.750	C18	0.049	C18	0.050	C14
N+3.60	C3	C35X45	0.000	15.750	C18	0.028	C18	0.058	C14
N+3.60	C3	C35X45	31.000	15.750	C18	0.028	C18	0.058	C14
N+3.60	C3	C35X45	62.000	15.750	C18	0.028	C18	0.058	C14
N+3.60	C3	C35X45	93.000	15.750	C18	0.028	C18	0.058	C14
N+3.60	C3	C35X45	124.000	15.750	C18	0.028	C18	0.058	C14
N+3.60	C3	C35X45	155.000	15.750	C18	0.028	C18	0.058	C14
N+3.60	C3	C35X45	186.000	15.750	C18	0.028	C18	0.058	C14
N+3.60	C3	C35X45	217.000	15.750	C18	0.028	C18	0.058	C14
N+3.60	C3	C35X45	248.000	15.750	C18	0.028	C18	0.058	C14
N+3.60	C3	C35X45	279.000	15.750	C18	0.028	C18	0.058	C14
N+3.60	C3	C35X45	310.000	15.750	C18	0.028	C18	0.058	C14
N+3.60	C4	C35X45	0.000	15.750	C18	0.039	C18	0.050	C14
N+3.60	C4	C35X45	31.000	15.750	C18	0.039	C18	0.050	C14
N+3.60	C4	C35X45	62.000	15.750	C18	0.039	C18	0.050	C14
N+3.60	C4	C35X45	93.000	15.750	C18	0.039	C18	0.050	C14
N+3.60	C4	C35X45	124.000	15.750	C18	0.039	C18	0.050	C14
N+3.60	C4	C35X45	155.000	15.750	C18	0.039	C18	0.050	C14
N+3.60	C4	C35X45	186.000	15.750	C18	0.039	C18	0.050	C14
N+3.60	C4	C35X45	217.000	15.750	C18	0.039	C18	0.050	C14
N+3.60	C4	C35X45	248.000	15.750	C18	0.039	C18	0.050	C14
N+3.60	C4	C35X45	279.000	15.750	C18	0.039	C18	0.050	C14
N+3.60	C4	C35X45	310.000	15.750	C18	0.039	C18	0.050	C14
N+3.60	C5	C35X45	0.000	15.750	C18	0.000	C18	0.000	C18
N+3.60	C5	C35X45	31.000	15.750	C18	0.000	C18	0.000	C18
N+3.60	C5	C35X45	62.000	15.750	C18	0.000	C18	0.000	C18
N+3.60	C5	C35X45	93.000	15.750	C18	0.000	C18	0.000	C18
N+3.60	C5	C35X45	124.000	15.750	C18	0.000	C18	0.000	C18
N+3.60	C5	C35X45	155.000	15.750	C18	0.000	C18	0.000	C18
N+3.60	C5	C35X45	186.000	15.750	C18	0.000	C18	0.000	C18
N+3.60	C5	C35X45	217.000	15.750	C18	0.000	C18	0.000	C18
N+3.60	C5	C35X45	248.000	15.750	C18	0.000	C18	0.000	C18
N+3.60	C5	C35X45	279.000	15.750	C18	0.000	C18	0.000	C18
N+3.60	C5	C35X45	310.000	15.750	C18	0.000	C18	0.000	C18



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 34 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	C6	C35X45	0.000	15.750	C18	0.056	C18	0.046	C14
N+3.60	C6	C35X45	31.000	15.750	C18	0.056	C18	0.046	C14
N+3.60	C6	C35X45	62.000	15.750	C18	0.056	C18	0.046	C14
N+3.60	C6	C35X45	93.000	15.750	C18	0.056	C18	0.046	C14
N+3.60	C6	C35X45	124.000	15.750	C18	0.060	C10	0.046	C14
N+3.60	C6	C35X45	155.000	15.750	C18	0.060	C10	0.046	C14
N+3.60	C6	C35X45	186.000	15.750	C18	0.060	C10	0.046	C14
N+3.60	C6	C35X45	217.000	15.750	C18	0.060	C10	0.046	C14
N+3.60	C6	C35X45	248.000	15.750	C18	0.060	C10	0.046	C14
N+3.60	C6	C35X45	279.000	15.750	C18	0.060	C10	0.046	C14
N+3.60	C6	C35X45	310.000	15.750	C18	0.060	C10	0.049	C4
N+3.60	C7	C35X45	0.000	18.944	C4	0.050	C10	0.064	C14
N+3.60	C7	C35X45	31.000	15.750	C18	0.050	C10	0.064	C14
N+3.60	C7	C35X45	62.000	15.750	C18	0.050	C10	0.064	C14
N+3.60	C7	C35X45	93.000	15.750	C18	0.050	C10	0.064	C14
N+3.60	C7	C35X45	124.000	15.750	C18	0.050	C10	0.064	C14
N+3.60	C7	C35X45	155.000	15.750	C18	0.050	C10	0.064	C14
N+3.60	C7	C35X45	186.000	15.750	C18	0.050	C10	0.064	C14
N+3.60	C7	C35X45	217.000	15.750	C18	0.050	C10	0.064	C14
N+3.60	C7	C35X45	248.000	15.750	C18	0.050	C10	0.064	C14
N+3.60	C7	C35X45	279.000	15.750	C18	0.050	C10	0.064	C14
N+3.60	C7	C35X45	310.000	18.123	C6	0.050	C10	0.064	C14
N+3.60	C8	C35X60	0.000	21.000	C18	0.055	C18	0.063	C14
N+3.60	C8	C35X60	31.000	21.000	C18	0.055	C18	0.063	C14
N+3.60	C8	C35X60	62.000	21.000	C18	0.055	C18	0.063	C14
N+3.60	C8	C35X60	93.000	21.000	C18	0.061	C10	0.063	C14
N+3.60	C8	C35X60	124.000	21.000	C18	0.061	C10	0.067	C6
N+3.60	C8	C35X60	155.000	21.000	C18	0.061	C10	0.067	C6
N+3.60	C8	C35X60	186.000	21.000	C18	0.061	C10	0.067	C6
N+3.60	C8	C35X60	217.000	21.000	C18	0.061	C10	0.067	C6
N+3.60	C8	C35X60	248.000	21.000	C18	0.061	C10	0.067	C6
N+3.60	C8	C35X60	279.000	21.000	C18	0.061	C10	0.067	C6
N+3.60	C8	C35X60	310.000	21.000	C18	0.061	C10	0.067	C6
N+3.60	C9	C35X45	0.000	15.750	C18	0.039	C18	0.057	C14
N+3.60	C9	C35X45	31.000	15.750	C18	0.039	C18	0.057	C14
N+3.60	C9	C35X45	62.000	15.750	C18	0.039	C18	0.057	C14
N+3.60	C9	C35X45	93.000	15.750	C18	0.039	C18	0.057	C14
N+3.60	C9	C35X45	124.000	15.750	C18	0.039	C18	0.057	C14
N+3.60	C9	C35X45	155.000	15.750	C18	0.039	C18	0.057	C14
N+3.60	C9	C35X45	186.000	15.750	C18	0.039	C18	0.057	C14
N+3.60	C9	C35X45	217.000	15.750	C18	0.039	C18	0.057	C14
N+3.60	C9	C35X45	248.000	15.750	C18	0.039	C18	0.057	C14
N+3.60	C9	C35X45	279.000	15.750	C18	0.039	C18	0.057	C14
N+3.60	C9	C35X45	310.000	15.750	C18	0.039	C18	0.057	C14
N+3.60	C10	C35X45	0.000	15.750	C18	0.047	C18	0.051	C14
N+3.60	C10	C35X45	31.000	15.750	C18	0.047	C18	0.051	C14
N+3.60	C10	C35X45	62.000	15.750	C18	0.047	C18	0.051	C14
N+3.60	C10	C35X45	93.000	15.750	C18	0.047	C18	0.051	C14
N+3.60	C10	C35X45	124.000	15.750	C18	0.047	C18	0.051	C14
N+3.60	C10	C35X45	155.000	15.750	C18	0.047	C18	0.051	C14
N+3.60	C10	C35X45	186.000	15.750	C18	0.047	C18	0.051	C14
N+3.60	C10	C35X45	217.000	15.750	C18	0.047	C18	0.051	C14
N+3.60	C10	C35X45	248.000	15.750	C18	0.047	C18	0.051	C14
N+3.60	C10	C35X45	279.000	15.750	C18	0.047	C18	0.051	C14
N+3.60	C10	C35X45	310.000	15.750	C18	0.047	C18	0.051	C14
N+3.60	C11	C35X60	0.000	21.000	C18	0.075	C18	0.059	C14
N+3.60	C11	C35X60	31.000	21.000	C18	0.075	C18	0.059	C14
N+3.60	C11	C35X60	62.000	21.000	C18	0.075	C18	0.059	C14
N+3.60	C11	C35X60	93.000	21.000	C18	0.075	C18	0.059	C14
N+3.60	C11	C35X60	124.000	21.000	C18	0.075	C18	0.059	C14
N+3.60	C11	C35X60	155.000	21.000	C18	0.075	C18	0.059	C14
N+3.60	C11	C35X60	186.000	21.000	C18	0.075	C18	0.059	C14
N+3.60	C11	C35X60	217.000	21.000	C18	0.075	C18	0.059	C14
N+3.60	C11	C35X60	248.000	21.000	C18	0.075	C18	0.059	C14

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 35 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	C11	C35X60	279.000	21.000	C18	0.075	C18	0.059	C14
N+3.60	C11	C35X60	310.000	21.000	C18	0.075	C18	0.059	C14
N+3.60	C12	C35X45	0.000	15.750	C18	0.053	C18	0.052	C14
N+3.60	C12	C35X45	31.000	15.750	C18	0.053	C18	0.052	C14
N+3.60	C12	C35X45	62.000	15.750	C18	0.053	C18	0.052	C14
N+3.60	C12	C35X45	93.000	15.750	C18	0.053	C18	0.052	C14
N+3.60	C12	C35X45	124.000	15.750	C18	0.053	C18	0.052	C14
N+3.60	C12	C35X45	155.000	15.750	C18	0.053	C18	0.052	C14
N+3.60	C12	C35X45	186.000	15.750	C18	0.053	C18	0.052	C14
N+3.60	C12	C35X45	217.000	15.750	C18	0.053	C18	0.052	C14
N+3.60	C12	C35X45	248.000	15.750	C18	0.053	C18	0.052	C14
N+3.60	C12	C35X45	279.000	15.750	C18	0.053	C18	0.052	C14
N+3.60	C12	C35X45	310.000	15.750	C18	0.053	C18	0.052	C14

RESISTENCIA AL CORTANTE DE COLUMNAS (C.21.3.3.2.b)

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CONCRETE COLUMN DESIGN OUTPUT (ACI 318-08/IBC 2009)

BIAXIAL P-M INTERACTION AND SHEAR DESIGN OF COLUMN-TYPE ELEMENTS

STORY ID	COLUMN LINE	SECTION ID	STATION ID	<-----REQUIRED REINFORCING----->					
				LONGITUDINAL	COMBO	SHEAR22	COMBO	SHEAR33	COMBO
N+3.60	C1	C35X45	0.000	58.545	VNC7	0.118	VNC7	0.151	VNC2
N+3.60	C1	C35X45	31.000	43.079	VNC7	0.118	VNC7	0.151	VNC2
N+3.60	C1	C35X45	62.000	28.769	VNC12	0.118	VNC7	0.151	VNC2
N+3.60	C1	C35X45	93.000	23.276	VNC16	0.118	VNC7	0.151	VNC2
N+3.60	C1	C35X45	124.000	15.750	VNC16	0.118	VNC7	0.151	VNC2
N+3.60	C1	C35X45	155.000	15.750	VNC16	0.118	VNC7	0.151	VNC2
N+3.60	C1	C35X45	186.000	15.750	VNC16	0.118	VNC7	0.151	VNC2
N+3.60	C1	C35X45	217.000	15.750	VNC16	0.118	VNC7	0.151	VNC2
N+3.60	C1	C35X45	248.000	15.750	VNC16	0.118	VNC7	0.151	VNC2
N+3.60	C1	C35X45	279.000	19.990	VNC2	0.118	VNC7	0.151	VNC2
N+3.60	C1	C35X45	310.000	27.771	VNC2	0.118	VNC7	0.151	VNC2
N+3.60	C2	C35X45	0.000	59.712	VNC2	0.115	VNC15	0.147	VNC10
N+3.60	C2	C35X45	31.000	42.958	VNC2	0.115	VNC15	0.147	VNC10
N+3.60	C2	C35X45	62.000	28.547	VNC12	0.115	VNC15	0.147	VNC10
N+3.60	C2	C35X45	93.000	21.880	VNC12	0.115	VNC15	0.147	VNC10
N+3.60	C2	C35X45	124.000	15.750	VNC16	0.115	VNC15	0.147	VNC10
N+3.60	C2	C35X45	155.000	15.750	VNC16	0.115	VNC15	0.147	VNC10
N+3.60	C2	C35X45	186.000	15.750	VNC16	0.115	VNC15	0.147	VNC10
N+3.60	C2	C35X45	217.000	15.750	VNC16	0.115	VNC15	0.147	VNC10
N+3.60	C2	C35X45	248.000	15.750	VNC16	0.115	VNC15	0.147	VNC10
N+3.60	C2	C35X45	279.000	19.275	VNC12	0.115	VNC15	0.147	VNC10
N+3.60	C2	C35X45	310.000	30.202	VNC2	0.115	VNC15	0.147	VNC10
N+3.60	C3	C35X45	0.000	51.631	VNC2	0.082	VNC15	0.155	VNC10
N+3.60	C3	C35X45	31.000	40.457	VNC2	0.082	VNC15	0.155	VNC10
N+3.60	C3	C35X45	62.000	28.832	VNC12	0.082	VNC15	0.155	VNC10
N+3.60	C3	C35X45	93.000	22.540	VNC12	0.082	VNC15	0.155	VNC10
N+3.60	C3	C35X45	124.000	15.750	VNC16	0.082	VNC15	0.155	VNC10
N+3.60	C3	C35X45	155.000	15.750	VNC16	0.082	VNC15	0.155	VNC10
N+3.60	C3	C35X45	186.000	15.750	VNC16	0.082	VNC15	0.155	VNC10
N+3.60	C3	C35X45	217.000	15.750	VNC16	0.083	VNC8	0.155	VNC10
N+3.60	C3	C35X45	248.000	15.750	VNC16	0.083	VNC8	0.155	VNC10
N+3.60	C3	C35X45	279.000	20.979	VNC12	0.083	VNC8	0.155	VNC10
N+3.60	C3	C35X45	310.000	27.979	VNC2	0.083	VNC8	0.155	VNC10
N+3.60	C4	C35X45	0.000	52.239	VNC2	0.097	VNC15	0.146	VNC10
N+3.60	C4	C35X45	31.000	39.515	VNC10	0.097	VNC15	0.146	VNC10
N+3.60	C4	C35X45	62.000	28.438	VNC12	0.097	VNC15	0.146	VNC10
N+3.60	C4	C35X45	93.000	21.884	VNC12	0.097	VNC15	0.146	VNC10




Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 36 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	C4	C35X45	124.000	15.750	VNC16	0.097	VNC15	0.146	VNC10
N+3.60	C4	C35X45	155.000	15.750	VNC16	0.097	VNC15	0.146	VNC10
N+3.60	C4	C35X45	186.000	15.750	VNC16	0.097	VNC15	0.146	VNC10
N+3.60	C4	C35X45	217.000	15.750	VNC16	0.097	VNC15	0.146	VNC10
N+3.60	C4	C35X45	248.000	15.750	VNC16	0.097	VNC15	0.146	VNC10
N+3.60	C4	C35X45	279.000	18.598	VNC12	0.097	VNC15	0.146	VNC10
N+3.60	C4	C35X45	310.000	26.825	VNC12	0.097	VNC15	0.146	VNC10
N+3.60	C5	C35X45	0.000	67.828	VNC7	0.129	VNC16	0.060	VNC16
N+3.60	C5	C35X45	31.000	48.524	VNC7	0.129	VNC16	0.060	VNC16
N+3.60	C5	C35X45	62.000	31.774	VNC7	0.129	VNC16	0.060	VNC16
N+3.60	C5	C35X45	93.000	22.175	VNC16	0.129	VNC16	0.060	VNC16
N+3.60	C5	C35X45	124.000	15.750	VNC16	0.129	VNC16	0.060	VNC16
N+3.60	C5	C35X45	155.000	15.750	VNC16	0.129	VNC16	0.060	VNC16
N+3.60	C5	C35X45	186.000	15.750	VNC16	0.129	VNC16	0.060	VNC16
N+3.60	C5	C35X45	217.000	15.750	VNC16	0.129	VNC16	0.060	VNC16
N+3.60	C5	C35X45	248.000	15.750	VNC16	0.129	VNC16	0.060	VNC16
N+3.60	C5	C35X45	279.000	15.750	VNC16	0.129	VNC16	0.060	VNC16
N+3.60	C5	C35X45	310.000	27.429	VNC2	0.129	VNC16	0.060	VNC16
N+3.60	C6	C35X45	0.000	75.190	VNC7	0.155	VNC7	0.128	VNC2
N+3.60	C6	C35X45	31.000	57.788	VNC7	0.155	VNC7	0.128	VNC2
N+3.60	C6	C35X45	62.000	41.326	VNC7	0.155	VNC7	0.128	VNC2
N+3.60	C6	C35X45	93.000	28.614	VNC16	0.155	VNC7	0.128	VNC2
N+3.60	C6	C35X45	124.000	21.343	VNC16	0.155	VNC7	0.128	VNC2
N+3.60	C6	C35X45	155.000	15.750	VNC16	0.155	VNC7	0.128	VNC2
N+3.60	C6	C35X45	186.000	15.750	VNC16	0.155	VNC7	0.128	VNC2
N+3.60	C6	C35X45	217.000	15.750	VNC16	0.155	VNC7	0.128	VNC2
N+3.60	C6	C35X45	248.000	15.750	VNC16	0.155	VNC7	0.128	VNC2
N+3.60	C6	C35X45	279.000	15.750	VNC16	0.155	VNC7	0.128	VNC2
N+3.60	C6	C35X45	310.000	26.111	VNC7	0.155	VNC7	0.128	VNC2
N+3.60	C7	C35X45	0.000	63.552	VNC7	0.128	VNC7	0.165	VNC2
N+3.60	C7	C35X45	31.000	45.894	VNC7	0.128	VNC7	0.165	VNC2
N+3.60	C7	C35X45	62.000	29.382	VNC7	0.128	VNC7	0.165	VNC2
N+3.60	C7	C35X45	93.000	23.302	VNC16	0.128	VNC7	0.165	VNC2
N+3.60	C7	C35X45	124.000	15.750	VNC16	0.128	VNC7	0.165	VNC2
N+3.60	C7	C35X45	155.000	15.750	VNC16	0.128	VNC7	0.165	VNC2
N+3.60	C7	C35X45	186.000	15.750	VNC16	0.128	VNC7	0.165	VNC2
N+3.60	C7	C35X45	217.000	15.750	VNC16	0.128	VNC7	0.165	VNC2
N+3.60	C7	C35X45	248.000	15.750	VNC16	0.128	VNC7	0.165	VNC2
N+3.60	C7	C35X45	279.000	24.755	VNC2	0.128	VNC7	0.165	VNC2
N+3.60	C7	C35X45	310.000	35.479	VNC2	0.128	VNC7	0.165	VNC2
N+3.60	C8	C35X60	0.000	75.290	VNC2	0.152	VNC8	0.184	VNC4
N+3.60	C8	C35X60	31.000	56.522	VNC2	0.152	VNC8	0.184	VNC4
N+3.60	C8	C35X60	62.000	39.797	VNC12	0.152	VNC8	0.184	VNC4
N+3.60	C8	C35X60	93.000	31.336	VNC12	0.152	VNC8	0.184	VNC4
N+3.60	C8	C35X60	124.000	21.000	VNC16	0.152	VNC8	0.184	VNC4
N+3.60	C8	C35X60	155.000	21.000	VNC16	0.152	VNC8	0.184	VNC4
N+3.60	C8	C35X60	186.000	21.000	VNC16	0.152	VNC8	0.184	VNC4
N+3.60	C8	C35X60	217.000	21.000	VNC16	0.152	VNC8	0.184	VNC4
N+3.60	C8	C35X60	248.000	21.000	VNC16	0.154	VNC7	0.184	VNC4
N+3.60	C8	C35X60	279.000	21.000	VNC16	0.154	VNC7	0.184	VNC4
N+3.60	C8	C35X60	310.000	32.924	VNC12	0.154	VNC7	0.184	VNC4
N+3.60	C9	C35X45	0.000	55.447	VNC2	0.108	VNC15	0.154	VNC10
N+3.60	C9	C35X45	31.000	40.847	VNC2	0.108	VNC15	0.154	VNC10
N+3.60	C9	C35X45	62.000	28.489	VNC12	0.108	VNC15	0.154	VNC10
N+3.60	C9	C35X45	93.000	21.709	VNC12	0.108	VNC15	0.154	VNC10
N+3.60	C9	C35X45	124.000	15.750	VNC16	0.108	VNC15	0.154	VNC10
N+3.60	C9	C35X45	155.000	15.750	VNC16	0.108	VNC15	0.154	VNC10
N+3.60	C9	C35X45	186.000	15.750	VNC16	0.108	VNC15	0.154	VNC10
N+3.60	C9	C35X45	217.000	15.750	VNC16	0.108	VNC15	0.154	VNC10
N+3.60	C9	C35X45	248.000	15.750	VNC16	0.108	VNC15	0.154	VNC10
N+3.60	C9	C35X45	279.000	21.225	VNC2	0.108	VNC15	0.154	VNC10
N+3.60	C9	C35X45	310.000	28.808	VNC2	0.108	VNC15	0.154	VNC10
N+3.60	C10	C35X45	0.000	56.101	VNC2	0.123	VNC15	0.147	VNC10




Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 37 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	C10	C35X45	31.000	40.224	VNC2	0.123	VNC15	0.147	VNC10
N+3.60	C10	C35X45	62.000	27.950	VNC12	0.123	VNC15	0.147	VNC10
N+3.60	C10	C35X45	93.000	20.733	VNC12	0.123	VNC15	0.147	VNC10
N+3.60	C10	C35X45	124.000	15.750	VNC16	0.123	VNC15	0.147	VNC10
N+3.60	C10	C35X45	155.000	15.750	VNC16	0.123	VNC15	0.147	VNC10
N+3.60	C10	C35X45	186.000	15.750	VNC16	0.123	VNC15	0.147	VNC10
N+3.60	C10	C35X45	217.000	15.750	VNC16	0.123	VNC15	0.147	VNC10
N+3.60	C10	C35X45	248.000	15.750	VNC16	0.123	VNC15	0.147	VNC10
N+3.60	C10	C35X45	279.000	19.542	VNC12	0.123	VNC15	0.147	VNC10
N+3.60	C10	C35X45	310.000	29.010	VNC2	0.123	VNC15	0.147	VNC10
N+3.60	C11	C35X60	0.000	91.560	VNC7	0.188	VNC16	0.177	VNC12
N+3.60	C11	C35X60	31.000	70.442	VNC7	0.188	VNC16	0.177	VNC12
N+3.60	C11	C35X60	62.000	49.577	VNC16	0.188	VNC16	0.177	VNC12
N+3.60	C11	C35X60	93.000	35.063	VNC16	0.188	VNC16	0.177	VNC12
N+3.60	C11	C35X60	124.000	25.167	VNC16	0.188	VNC16	0.177	VNC12
N+3.60	C11	C35X60	155.000	21.000	VNC16	0.188	VNC16	0.177	VNC12
N+3.60	C11	C35X60	186.000	21.000	VNC16	0.188	VNC16	0.177	VNC12
N+3.60	C11	C35X60	217.000	21.000	VNC16	0.188	VNC16	0.177	VNC12
N+3.60	C11	C35X60	248.000	21.000	VNC16	0.188	VNC16	0.177	VNC12
N+3.60	C11	C35X60	279.000	21.000	VNC16	0.192	VNC15	0.177	VNC12
N+3.60	C11	C35X60	310.000	32.418	VNC2	0.192	VNC15	0.177	VNC12
N+3.60	C12	C35X45	0.000	74.795	VNC7	0.153	VNC15	0.139	VNC4
N+3.60	C12	C35X45	31.000	56.857	VNC7	0.153	VNC15	0.139	VNC4
N+3.60	C12	C35X45	62.000	39.818	VNC8	0.153	VNC15	0.139	VNC4
N+3.60	C12	C35X45	93.000	28.173	VNC16	0.153	VNC15	0.139	VNC4
N+3.60	C12	C35X45	124.000	20.904	VNC16	0.153	VNC15	0.139	VNC4
N+3.60	C12	C35X45	155.000	15.750	VNC16	0.153	VNC15	0.139	VNC4
N+3.60	C12	C35X45	186.000	15.750	VNC16	0.153	VNC7	0.139	VNC4
N+3.60	C12	C35X45	217.000	15.750	VNC16	0.153	VNC7	0.139	VNC4
N+3.60	C12	C35X45	248.000	15.750	VNC16	0.153	VNC7	0.139	VNC4
N+3.60	C12	C35X45	279.000	18.054	VNC16	0.153	VNC7	0.143	VNC2
N+3.60	C12	C35X45	310.000	28.549	VNC7	0.153	VNC7	0.143	VNC2

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 38 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

ANEXO 6.2. DISEÑO DE VIGAS

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 39 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

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CONCRETE BEAM DESIGN OUTPUT (ACI 318-08/IBC 2009)

FLEXURAL AND TORSION DESIGN OF BEAM-TYPE ELEMENTS

STORY ID	BEAM BAY	SECTION ID	STATION ID	-----REQUIRED REINFORCING----->					
				TOP	COMBO	BOTTOM	COMBO	TORSION	COMBO
N+3.60	B1	V15X50	0.000	0.529	ENVC	0.842	ENVC	0.000	ENVC
N+3.60	B1	V15X50	78.700	0.329	ENVC	1.104	ENVC	0.000	ENVC
N+3.60	B1	V15X50	157.400	0.329	ENVC	1.261	ENVC	0.000	ENVC
N+3.60	B1	V15X50	236.100	0.329	ENVC	1.310	ENVC	0.000	ENVC
N+3.60	B1	V15X50	314.800	0.329	ENVC	1.251	ENVC	0.000	ENVC
N+3.60	B1	V15X50	393.500	0.329	ENVC	1.085	ENVC	0.000	ENVC
N+3.60	B1	V15X50	472.200	0.329	ENVC	0.857	ENVC	0.000	ENVC
N+3.60	B1	V15X50	550.900	0.329	ENVC	0.603	ENVC	0.000	ENVC
N+3.60	B1	V15X50	629.600	0.329	ENVC	0.329	ENVC	0.000	ENVC
N+3.60	B1	V15X50	708.300	0.630	ENVC	0.329	ENVC	0.000	ENVC
N+3.60	B1	V15X50	787.000	1.330	ENVC	0.661	ENVC	0.000	ENVC
N+3.60	B2	V15X50	0.000	1.200	ENVC	0.597	ENVC	0.000	ENVC
N+3.60	B2	V15X50	78.700	0.591	ENVC	0.297	ENVC	0.000	ENVC
N+3.60	B2	V15X50	157.400	0.297	ENVC	0.297	ENVC	0.000	ENVC
N+3.60	B2	V15X50	236.100	0.297	ENVC	0.455	ENVC	0.000	ENVC
N+3.60	B2	V15X50	314.800	0.297	ENVC	0.668	ENVC	0.000	ENVC
N+3.60	B2	V15X50	393.500	0.297	ENVC	0.792	ENVC	0.000	ENVC
N+3.60	B2	V15X50	472.200	0.297	ENVC	0.835	ENVC	0.000	ENVC
N+3.60	B2	V15X50	550.900	0.297	ENVC	0.803	ENVC	0.000	ENVC
N+3.60	B2	V15X50	629.600	0.297	ENVC	0.664	ENVC	0.000	ENVC
N+3.60	B2	V15X50	708.300	0.297	ENVC	0.420	ENVC	0.000	ENVC
N+3.60	B2	V15X50	787.000	0.714	ENVC	0.356	ENVC	0.000	ENVC
N+3.60	B3	V15X50	0.000	0.854	ENVC	0.425	ENVC	0.000	ENVC
N+3.60	B3	V15X50	78.700	0.367	ENVC	0.329	ENVC	0.000	ENVC
N+3.60	B3	V15X50	157.400	0.329	ENVC	0.524	ENVC	0.000	ENVC
N+3.60	B3	V15X50	236.100	0.329	ENVC	0.664	ENVC	0.000	ENVC
N+3.60	B3	V15X50	314.800	0.329	ENVC	0.698	ENVC	0.000	ENVC
N+3.60	B3	V15X50	393.500	0.329	ENVC	0.672	ENVC	0.000	ENVC
N+3.60	B3	V15X50	472.200	0.329	ENVC	0.541	ENVC	0.000	ENVC
N+3.60	B3	V15X50	550.900	0.329	ENVC	0.329	ENVC	0.000	ENVC
N+3.60	B3	V15X50	629.600	0.329	ENVC	0.329	ENVC	0.000	ENVC
N+3.60	B3	V15X50	708.300	0.719	ENVC	0.329	ENVC	0.000	ENVC
N+3.60	B3	V15X50	787.000	1.328	ENVC	0.660	ENVC	0.000	ENVC
N+3.60	B4	V15X50	0.000	1.445	ENVC	0.717	ENVC	0.000	ENVC
N+3.60	B4	V15X50	78.700	0.780	ENVC	0.357	ENVC	0.000	ENVC
N+3.60	B4	V15X50	157.400	0.357	ENVC	0.357	ENVC	0.000	ENVC
N+3.60	B4	V15X50	236.100	0.357	ENVC	0.385	ENVC	0.000	ENVC
N+3.60	B4	V15X50	314.800	0.357	ENVC	0.624	ENVC	0.000	ENVC
N+3.60	B4	V15X50	393.500	0.357	ENVC	0.784	ENVC	0.000	ENVC
N+3.60	B4	V15X50	472.200	0.357	ENVC	0.911	ENVC	0.000	ENVC
N+3.60	B4	V15X50	550.900	0.357	ENVC	0.931	ENVC	0.000	ENVC
N+3.60	B4	V15X50	629.600	0.357	ENVC	0.845	ENVC	0.000	ENVC
N+3.60	B4	V15X50	708.300	0.376	ENVC	0.653	ENVC	0.000	ENVC
N+3.60	B4	V15X50	787.000	0.819	ENVC	0.408	ENVC	0.000	ENVC
N+3.60	B5	V30X50	0.000	0.074	ENVC	0.037	ENVC	6.093	C10
N+3.60	B5	V30X50	15.750	1.434	ENVC	1.434	ENVC	6.093	C10
N+3.60	B5	V30X50	31.500	1.434	ENVC	1.434	ENVC	6.093	C10
N+3.60	B5	V30X50	47.250	1.434	ENVC	1.434	ENVC	6.093	C10
N+3.60	B5	V30X50	63.000	1.434	ENVC	1.434	ENVC	6.093	C10
N+3.60	B5	V30X50	78.750	1.685	ENVC	1.434	ENVC	6.093	C10
N+3.60	B5	V30X50	94.500	2.309	ENVC	1.434	ENVC	6.093	C10
N+3.60	B5	V30X50	110.250	3.036	ENVC	1.434	ENVC	6.093	C10
N+3.60	B5	V30X50	126.000	3.869	ENVC	1.434	ENVC	6.093	C10
N+3.60	B5	V30X50	141.750	4.520	ENVC	1.434	ENVC	6.093	C10
N+3.60	B5	V30X50	157.500	4.520	ENVC	2.889	ENVC	6.093	C10



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 40 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B6	V35X50	0.000	0.000	ENVC	0.148	ENVC	7.239	C14
N+3.60	B6	V35X50	15.750	2.953	ENVC	2.953	ENVC	7.239	C14
N+3.60	B6	V35X50	31.500	2.953	ENVC	2.953	ENVC	7.239	C14
N+3.60	B6	V35X50	47.250	2.953	ENVC	2.953	ENVC	7.239	C14
N+3.60	B6	V35X50	63.000	2.953	ENVC	2.953	ENVC	7.239	C14
N+3.60	B6	V35X50	78.750	3.478	ENVC	2.953	ENVC	7.239	C14
N+3.60	B6	V35X50	94.500	4.799	ENVC	2.953	ENVC	7.239	C14
N+3.60	B6	V35X50	110.250	5.273	ENVC	2.953	ENVC	7.239	C14
N+3.60	B6	V35X50	126.000	6.064	ENVC	2.953	ENVC	7.239	C14
N+3.60	B6	V35X50	141.750	7.554	ENVC	2.953	ENVC	7.239	C14
N+3.60	B6	V35X50	157.500	9.227	ENVC	5.273	ENVC	7.239	C14
N+3.60	B7	V35X50	0.000	0.086	ENVC	0.043	ENVC	7.274	C18
N+3.60	B7	V35X50	15.750	1.571	ENVC	1.571	ENVC	7.274	C18
N+3.60	B7	V35X50	31.500	1.571	ENVC	1.571	ENVC	7.274	C18
N+3.60	B7	V35X50	47.250	1.571	ENVC	1.571	ENVC	7.274	C18
N+3.60	B7	V35X50	63.000	1.571	ENVC	1.571	ENVC	7.274	C18
N+3.60	B7	V35X50	78.750	1.869	ENVC	1.571	ENVC	7.274	C18
N+3.60	B7	V35X50	94.500	2.550	ENVC	1.571	ENVC	7.274	C18
N+3.60	B7	V35X50	110.250	3.343	ENVC	1.571	ENVC	7.274	C18
N+3.60	B7	V35X50	126.000	4.250	ENVC	1.571	ENVC	7.274	C18
N+3.60	B7	V35X50	141.750	5.273	ENVC	1.571	ENVC	7.274	C18
N+3.60	B7	V35X50	157.500	5.273	ENVC	3.164	ENVC	7.274	C18
N+3.60	B8	V35X50	0.000	0.033	ENVC	0.017	ENVC	7.274	C18
N+3.60	B8	V35X50	15.750	1.560	ENVC	1.560	ENVC	7.274	C18
N+3.60	B8	V35X50	31.500	1.560	ENVC	1.560	ENVC	7.274	C18
N+3.60	B8	V35X50	47.250	1.560	ENVC	1.560	ENVC	7.274	C18
N+3.60	B8	V35X50	63.000	1.560	ENVC	1.560	ENVC	7.274	C18
N+3.60	B8	V35X50	78.750	1.816	ENVC	1.560	ENVC	7.274	C18
N+3.60	B8	V35X50	94.500	2.498	ENVC	1.560	ENVC	7.274	C18
N+3.60	B8	V35X50	110.250	3.292	ENVC	1.560	ENVC	7.274	C18
N+3.60	B8	V35X50	126.000	4.200	ENVC	1.560	ENVC	7.274	C18
N+3.60	B8	V35X50	141.750	5.224	ENVC	1.560	ENVC	7.274	C18
N+3.60	B8	V35X50	157.500	5.273	ENVC	3.141	ENVC	7.274	C18
N+3.60	B9	V35X50	0.000	0.000	ENVC	0.045	ENVC	7.272	C14
N+3.60	B9	V35X50	15.750	2.955	ENVC	2.955	ENVC	7.272	C14
N+3.60	B9	V35X50	31.500	2.955	ENVC	2.955	ENVC	7.272	C14
N+3.60	B9	V35X50	47.250	2.955	ENVC	2.955	ENVC	7.272	C14
N+3.60	B9	V35X50	63.000	2.955	ENVC	2.955	ENVC	7.272	C14
N+3.60	B9	V35X50	78.750	3.539	ENVC	2.955	ENVC	7.272	C14
N+3.60	B9	V35X50	94.500	4.849	ENVC	2.955	ENVC	7.272	C14
N+3.60	B9	V35X50	110.250	5.273	ENVC	2.955	ENVC	7.272	C14
N+3.60	B9	V35X50	126.000	6.086	ENVC	2.955	ENVC	7.272	C14
N+3.60	B9	V35X50	141.750	7.567	ENVC	2.955	ENVC	7.272	C14
N+3.60	B9	V35X50	157.500	9.232	ENVC	5.273	ENVC	7.272	C14
N+3.60	B10	V30X50	0.000	0.027	ENVC	0.014	ENVC	6.341	C18
N+3.60	B10	V30X50	15.750	1.444	ENVC	1.444	ENVC	6.341	C18
N+3.60	B10	V30X50	31.500	1.444	ENVC	1.444	ENVC	6.341	C18
N+3.60	B10	V30X50	47.250	1.444	ENVC	1.444	ENVC	6.341	C18
N+3.60	B10	V30X50	63.000	1.444	ENVC	1.444	ENVC	6.341	C18
N+3.60	B10	V30X50	78.750	1.678	ENVC	1.444	ENVC	6.341	C18
N+3.60	B10	V30X50	94.500	2.311	ENVC	1.444	ENVC	6.341	C18
N+3.60	B10	V30X50	110.250	3.048	ENVC	1.444	ENVC	6.341	C18
N+3.60	B10	V30X50	126.000	3.891	ENVC	1.444	ENVC	6.341	C18
N+3.60	B10	V30X50	141.750	4.520	ENVC	1.444	ENVC	6.341	C18
N+3.60	B10	V30X50	157.500	4.520	ENVC	2.910	ENVC	6.341	C18
N+3.60	B12	V30X50	17.500	6.258	ENVC	4.083	ENVC	5.728	C14
N+3.60	B12	V30X50	92.700	4.520	ENVC	2.021	ENVC	5.728	C14
N+3.60	B12	V30X50	167.900	2.222	ENVC	2.021	ENVC	5.728	C14
N+3.60	B12	V30X50	243.100	2.021	ENVC	2.590	C2	5.728	C14
N+3.60	B12	V30X50	318.300	2.021	ENVC	4.271	C2	5.728	C14
N+3.60	B12	V30X50	393.500	2.021	ENVC	4.520	C2	5.728	C14
N+3.60	B12	V30X50	468.700	2.021	ENVC	4.801	C2	5.728	C14
N+3.60	B12	V30X50	543.900	2.021	ENVC	5.117	C2	5.728	C14
N+3.60	B12	V30X50	572.000	2.021	ENVC	5.151	C2	5.728	C14



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Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 41 DE 64
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N+3.60	B13	V30X50	17.500	4.835	ENVC	3.171	ENVC	0.000	ENVC
N+3.60	B13	V30X50	74.000	4.520	ENVC	1.573	ENVC	0.000	ENVC
N+3.60	B13	V30X50	130.500	3.033	ENVC	1.573	ENVC	0.000	ENVC
N+3.60	B13	V30X50	187.000	1.705	ENVC	1.573	ENVC	0.000	ENVC
N+3.60	B13	V30X50	243.500	1.573	ENVC	1.573	ENVC	0.000	ENVC
N+3.60	B13	V30X50	300.000	1.573	ENVC	1.573	ENVC	0.000	ENVC
N+3.60	B13	V30X50	356.500	1.573	ENVC	1.573	ENVC	0.000	ENVC
N+3.60	B13	V30X50	413.000	1.573	ENVC	1.573	ENVC	0.000	ENVC
N+3.60	B13	V30X50	469.500	1.573	ENVC	1.573	ENVC	0.000	ENVC
N+3.60	B13	V30X50	526.000	2.307	ENVC	1.573	ENVC	0.000	ENVC
N+3.60	B13	V30X50	582.500	3.524	ENVC	1.746	ENVC	0.000	ENVC
N+3.60	B14	V30X50	17.500	2.970	ENVC	1.474	ENVC	0.000	ENVC
N+3.60	B14	V30X50	92.700	1.784	ENVC	1.262	ENVC	0.000	ENVC
N+3.60	B14	V30X50	167.900	0.910	ENVC	1.400	ENVC	0.000	ENVC
N+3.60	B14	V30X50	243.100	0.910	ENVC	1.445	ENVC	0.000	ENVC
N+3.60	B14	V30X50	318.300	0.910	ENVC	1.296	ENVC	0.000	ENVC
N+3.60	B14	V30X50	393.500	0.910	ENVC	1.132	ENVC	0.000	ENVC
N+3.60	B14	V30X50	468.700	0.910	ENVC	1.149	ENVC	0.000	ENVC
N+3.60	B14	V30X50	543.900	0.910	ENVC	1.156	ENVC	0.000	ENVC
N+3.60	B14	V30X50	619.100	1.226	ENVC	1.009	ENVC	0.000	ENVC
N+3.60	B14	V30X50	694.300	2.352	ENVC	0.910	ENVC	0.000	ENVC
N+3.60	B14	V30X50	769.500	3.689	ENVC	1.828	ENVC	0.000	ENVC
N+3.60	B15	V30X50	17.500	4.178	ENVC	2.067	ENVC	0.000	ENVC
N+3.60	B15	V30X50	92.700	2.626	ENVC	1.219	ENVC	0.000	ENVC
N+3.60	B15	V30X50	167.900	1.313	ENVC	1.300	ENVC	0.000	ENVC
N+3.60	B15	V30X50	243.100	1.028	ENVC	1.363	ENVC	0.000	ENVC
N+3.60	B15	V30X50	318.300	1.028	ENVC	1.232	ENVC	0.000	ENVC
N+3.60	B15	V30X50	393.500	1.028	ENVC	1.501	ENVC	0.000	ENVC
N+3.60	B15	V30X50	468.700	1.028	ENVC	2.051	ENVC	0.000	ENVC
N+3.60	B15	V30X50	543.900	1.028	ENVC	2.408	ENVC	0.000	ENVC
N+3.60	B15	V30X50	619.100	1.398	ENVC	2.570	ENVC	0.000	ENVC
N+3.60	B15	V30X50	694.300	2.362	ENVC	2.535	ENVC	0.000	ENVC
N+3.60	B15	V30X50	769.500	3.643	ENVC	2.460	ENVC	0.000	ENVC
N+3.60	B16	V30X50	22.500	5.067	ENVC	3.320	ENVC	6.361	ENVC
N+3.60	B16	V30X50	76.500	4.408	ENVC	1.803	ENVC	6.361	ENVC
N+3.60	B16	V30X50	130.500	2.480	ENVC	1.920	ENVC	6.361	ENVC
N+3.60	B16	V30X50	184.500	1.795	ENVC	2.025	ENVC	6.361	ENVC
N+3.60	B16	V30X50	238.500	1.795	ENVC	1.795	ENVC	6.361	ENVC
N+3.60	B16	V30X50	292.500	1.795	ENVC	1.820	C2	6.361	ENVC
N+3.60	B16	V30X50	346.500	1.795	ENVC	1.795	ENVC	6.361	ENVC
N+3.60	B16	V30X50	400.500	1.795	ENVC	1.795	ENVC	6.361	ENVC
N+3.60	B16	V30X50	454.500	2.789	ENVC	1.880	ENVC	6.361	ENVC
N+3.60	B16	V30X50	508.500	4.520	ENVC	1.795	ENVC	6.361	ENVC
N+3.60	B16	V30X50	562.500	5.539	ENVC	3.623	ENVC	6.361	ENVC
N+3.60	B17	V35X50	22.500	7.044	ENVC	4.600	ENVC	0.000	ENVC
N+3.60	B17	V35X50	75.750	5.304	ENVC	2.277	ENVC	0.000	ENVC
N+3.60	B17	V35X50	129.000	5.021	ENVC	2.277	ENVC	0.000	ENVC
N+3.60	B17	V35X50	182.250	3.225	ENVC	2.277	ENVC	0.000	ENVC
N+3.60	B17	V35X50	235.500	2.277	ENVC	2.277	ENVC	0.000	ENVC
N+3.60	B17	V35X50	288.750	2.277	ENVC	2.277	ENVC	0.000	ENVC
N+3.60	B17	V35X50	342.000	2.277	ENVC	2.277	ENVC	0.000	ENVC
N+3.60	B17	V35X50	395.250	2.277	ENVC	2.277	ENVC	0.000	ENVC
N+3.60	B17	V35X50	448.500	2.397	ENVC	2.490	ENVC	0.000	ENVC
N+3.60	B17	V35X50	501.750	3.408	ENVC	3.144	ENVC	0.000	ENVC
N+3.60	B17	V35X50	555.000	4.649	ENVC	3.673	ENVC	0.000	ENVC
N+3.60	B19	V35X50	22.500	8.822	ENVC	5.273	ENVC	0.000	ENVC
N+3.60	B19	V35X50	76.500	5.273	ENVC	2.829	ENVC	0.000	ENVC
N+3.60	B19	V35X50	130.500	2.829	ENVC	3.548	ENVC	0.000	ENVC
N+3.60	B19	V35X50	184.500	2.829	ENVC	5.273	ENVC	0.000	ENVC
N+3.60	B19	V35X50	238.500	2.829	ENVC	6.635	C2	0.000	ENVC
N+3.60	B19	V35X50	292.500	2.829	ENVC	7.301	C2	0.000	ENVC
N+3.60	B19	V35X50	346.500	2.829	ENVC	6.994	C2	0.000	ENVC
N+3.60	B19	V35X50	400.500	2.829	ENVC	5.725	C2	0.000	ENVC



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 42 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B19	V35X50	454.500	2.829	ENVC	4.715	C2	0.000	ENVC
N+3.60	B19	V35X50	485.000	2.829	ENVC	2.829	ENVC	0.000	ENVC
N+3.60	B19	V35X50	485.000	2.829	ENVC	2.829	ENVC	7.245	C2
N+3.60	B19	V35X50	508.500	3.095	ENVC	2.829	ENVC	7.245	C2
N+3.60	B19	V35X50	562.500	7.617	ENVC	4.965	ENVC	7.245	C2
N+3.60	B20	V35X50	22.500	14.723	ENVC	7.031	ENVC	0.000	ENVC
N+3.60	B20	V35X50	75.750	6.433	ENVC	4.591	ENVC	0.000	ENVC
N+3.60	B20	V35X50	129.000	4.591	ENVC	5.049	C2	0.000	ENVC
N+3.60	B20	V35X50	182.250	4.591	ENVC	7.940	C2	0.000	ENVC
N+3.60	B20	V35X50	235.500	4.591	ENVC	10.602	C2	0.000	ENVC
N+3.60	B20	V35X50	288.750	4.591	ENVC	11.620	C2	0.000	ENVC
N+3.60	B20	V35X50	342.000	4.591	ENVC	10.930	C2	0.000	ENVC
N+3.60	B20	V35X50	395.250	4.591	ENVC	8.574	C2	0.000	ENVC
N+3.60	B20	V35X50	448.500	4.591	ENVC	5.273	ENVC	0.000	ENVC
N+3.60	B20	V35X50	501.750	5.770	ENVC	4.591	ENVC	0.000	ENVC
N+3.60	B20	V35X50	555.000	13.723	ENVC	6.576	ENVC	0.000	ENVC
N+3.60	B21	V30X50	22.500	9.492	ENVC	4.589	ENVC	6.361	ENVC
N+3.60	B21	V30X50	76.500	4.898	ENVC	3.104	ENVC	6.361	ENVC
N+3.60	B21	V30X50	130.500	3.104	ENVC	4.292	ENVC	6.361	ENVC
N+3.60	B21	V30X50	184.500	3.104	ENVC	4.520	ENVC	6.361	ENVC
N+3.60	B21	V30X50	238.500	3.104	ENVC	5.375	C2	6.361	ENVC
N+3.60	B21	V30X50	292.500	3.104	ENVC	5.829	C2	6.361	ENVC
N+3.60	B21	V30X50	346.500	3.104	ENVC	5.421	C2	6.361	ENVC
N+3.60	B21	V30X50	400.500	3.104	ENVC	4.520	ENVC	6.361	ENVC
N+3.60	B21	V30X50	454.500	3.104	ENVC	3.777	ENVC	6.361	ENVC
N+3.60	B21	V30X50	508.500	5.097	ENVC	3.104	ENVC	6.361	ENVC
N+3.60	B21	V30X50	562.500	9.797	ENVC	4.731	ENVC	6.361	ENVC
N+3.60	B23	V30X50	17.500	11.192	ENVC	5.375	ENVC	6.361	C14
N+3.60	B23	V30X50	92.700	6.030	ENVC	3.518	ENVC	6.361	C14
N+3.60	B23	V30X50	167.900	3.518	ENVC	3.518	ENVC	6.361	C14
N+3.60	B23	V30X50	243.100	3.518	ENVC	5.161	C2	6.361	C14
N+3.60	B23	V30X50	318.300	3.518	ENVC	7.303	C2	6.361	C14
N+3.60	B23	V30X50	393.500	3.518	ENVC	8.559	C2	6.361	C14
N+3.60	B23	V30X50	468.700	3.518	ENVC	8.881	C2	6.361	C14
N+3.60	B23	V30X50	543.900	3.518	ENVC	8.255	C2	6.361	C14
N+3.60	B23	V30X50	572.000	3.518	ENVC	7.782	C2	6.361	C14
N+3.60	B23	V30X50	572.000	3.518	ENVC	7.916	C2	5.893	C14
N+3.60	B23	V30X50	619.100	3.518	ENVC	5.143	C2	5.893	C14
N+3.60	B23	V30X50	694.300	4.520	ENVC	3.518	ENVC	5.893	C14
N+3.60	B23	V30X50	769.500	9.719	ENVC	4.695	ENVC	5.893	C14
N+3.60	B24	V30X50	17.500	6.455	ENVC	4.209	ENVC	0.000	ENVC
N+3.60	B24	V30X50	74.000	4.520	ENVC	2.082	ENVC	0.000	ENVC
N+3.60	B24	V30X50	130.500	2.773	ENVC	2.082	ENVC	0.000	ENVC
N+3.60	B24	V30X50	187.000	2.082	ENVC	2.420	C2	0.000	ENVC
N+3.60	B24	V30X50	243.500	2.082	ENVC	3.461	C2	0.000	ENVC
N+3.60	B24	V30X50	300.000	2.082	ENVC	3.916	C2	0.000	ENVC
N+3.60	B24	V30X50	356.500	2.082	ENVC	3.777	C2	0.000	ENVC
N+3.60	B24	V30X50	413.000	2.082	ENVC	3.045	C2	0.000	ENVC
N+3.60	B24	V30X50	469.500	2.082	ENVC	2.082	ENVC	0.000	ENVC
N+3.60	B24	V30X50	526.000	3.568	ENVC	2.082	ENVC	0.000	ENVC
N+3.60	B24	V30X50	582.500	4.718	ENVC	3.095	ENVC	0.000	ENVC
N+3.60	B25	V30X50	17.500	5.939	ENVC	3.880	ENVC	0.000	ENVC
N+3.60	B25	V30X50	92.700	3.615	ENVC	2.498	ENVC	0.000	ENVC
N+3.60	B25	V30X50	167.900	2.498	ENVC	3.105	C2	0.000	ENVC
N+3.60	B25	V30X50	243.100	2.498	ENVC	4.520	C2	0.000	ENVC
N+3.60	B25	V30X50	318.300	2.498	ENVC	4.953	C2	0.000	ENVC
N+3.60	B25	V30X50	393.500	2.498	ENVC	5.204	C2	0.000	ENVC
N+3.60	B25	V30X50	468.700	2.498	ENVC	4.729	C2	0.000	ENVC
N+3.60	B25	V30X50	543.900	2.498	ENVC	4.520	C2	0.000	ENVC
N+3.60	B25	V30X50	619.100	2.498	ENVC	2.498	ENVC	0.000	ENVC
N+3.60	B25	V30X50	694.300	4.520	ENVC	2.498	ENVC	0.000	ENVC
N+3.60	B25	V30X50	769.500	7.799	ENVC	4.520	ENVC	0.000	ENVC
N+3.60	B26	V30X50	17.500	8.621	ENVC	4.520	ENVC	0.000	ENVC



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 43 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B26	V30X50	92.700	4.612	ENVC	2.749	ENVC	0.000	ENVC
N+3.60	B26	V30X50	167.900	2.749	ENVC	2.749	ENVC	0.000	ENVC
N+3.60	B26	V30X50	243.100	2.749	ENVC	4.520	C2	0.000	ENVC
N+3.60	B26	V30X50	318.300	2.749	ENVC	5.077	C2	0.000	ENVC
N+3.60	B26	V30X50	393.500	2.749	ENVC	5.688	C2	0.000	ENVC
N+3.60	B26	V30X50	468.700	2.749	ENVC	5.570	C2	0.000	ENVC
N+3.60	B26	V30X50	543.900	2.749	ENVC	4.727	C2	0.000	ENVC
N+3.60	B26	V30X50	619.100	2.749	ENVC	4.486	ENVC	0.000	ENVC
N+3.60	B26	V30X50	694.300	2.840	ENVC	2.749	ENVC	0.000	ENVC
N+3.60	B26	V30X50	769.500	5.289	ENVC	3.463	ENVC	0.000	ENVC
N+3.60	B27	V35X50	22.500	5.273	ENVC	2.713	ENVC	7.222	C18
N+3.60	B27	V35X50	42.384	4.912	ENVC	1.349	ENVC	7.222	C18
N+3.60	B27	V35X50	62.269	4.352	ENVC	1.349	ENVC	7.222	C18
N+3.60	B27	V35X50	82.153	3.812	ENVC	1.349	ENVC	7.222	C18
N+3.60	B27	V35X50	102.038	3.289	ENVC	1.349	ENVC	7.222	C18
N+3.60	B27	V35X50	121.922	2.786	ENVC	1.349	ENVC	7.222	C18
N+3.60	B27	V35X50	141.807	2.435	ENVC	1.349	ENVC	7.222	C18
N+3.60	B27	V35X50	161.691	2.262	ENVC	1.349	ENVC	7.222	C18
N+3.60	B27	V35X50	181.576	2.124	ENVC	1.349	ENVC	7.222	C18
N+3.60	B27	V35X50	201.460	2.279	ENVC	1.349	ENVC	7.222	C18
N+3.60	B27	V35X50	221.345	2.450	ENVC	1.219	ENVC	7.222	C18
N+3.60	B28	V35X50	22.500	6.404	ENVC	4.190	ENVC	7.274	C14
N+3.60	B28	V35X50	42.384	5.712	ENVC	2.076	ENVC	7.274	C14
N+3.60	B28	V35X50	62.269	5.273	ENVC	2.076	ENVC	7.274	C14
N+3.60	B28	V35X50	82.153	5.273	ENVC	2.076	ENVC	7.274	C14
N+3.60	B28	V35X50	102.038	4.992	ENVC	2.076	ENVC	7.274	C14
N+3.60	B28	V35X50	121.922	4.163	ENVC	2.076	ENVC	7.274	C14
N+3.60	B28	V35X50	141.807	3.565	ENVC	2.076	ENVC	7.274	C14
N+3.60	B28	V35X50	161.691	3.085	ENVC	2.076	ENVC	7.274	C14
N+3.60	B28	V35X50	181.576	2.626	ENVC	2.076	ENVC	7.274	C14
N+3.60	B28	V35X50	201.460	2.549	ENVC	2.076	ENVC	7.274	C14
N+3.60	B28	V35X50	221.345	2.489	ENVC	1.238	ENVC	7.274	C14
N+3.60	B29	V30X50	22.500	6.546	ENVC	4.266	ENVC	0.000	ENVC
N+3.60	B29	V30X50	49.750	5.620	ENVC	2.110	ENVC	0.000	ENVC
N+3.60	B29	V30X50	77.000	4.726	ENVC	2.110	ENVC	0.000	ENVC
N+3.60	B29	V30X50	104.250	4.520	ENVC	2.110	ENVC	0.000	ENVC
N+3.60	B29	V30X50	131.500	4.039	ENVC	2.110	ENVC	0.000	ENVC
N+3.60	B29	V30X50	158.750	2.966	ENVC	2.110	ENVC	0.000	ENVC
N+3.60	B29	V30X50	186.000	2.110	ENVC	2.110	ENVC	0.000	ENVC
N+3.60	B29	V30X50	213.250	2.110	ENVC	2.110	ENVC	0.000	ENVC
N+3.60	B29	V30X50	235.000	2.110	ENVC	2.110	ENVC	0.000	ENVC
N+3.60	B29	V30X50	235.000	2.110	ENVC	2.110	ENVC	0.000	ENVC
N+3.60	B29	V30X50	240.500	2.110	ENVC	2.110	ENVC	0.000	ENVC
N+3.60	B29	V30X50	267.750	2.110	ENVC	2.110	ENVC	0.000	ENVC
N+3.60	B29	V30X50	295.000	0.000	ENVC	0.000	ENVC	0.000	ENVC
N+3.60	B30	V35X50	30.000	5.445	ENVC	3.573	ENVC	0.000	ENVC
N+3.60	B30	V35X50	56.500	5.273	ENVC	1.773	ENVC	0.000	ENVC
N+3.60	B30	V35X50	83.000	5.088	ENVC	1.773	ENVC	0.000	ENVC
N+3.60	B30	V35X50	109.500	4.061	C10	1.773	ENVC	0.000	ENVC
N+3.60	B30	V35X50	136.000	3.071	ENVC	1.773	ENVC	0.000	ENVC
N+3.60	B30	V35X50	162.500	2.173	ENVC	1.773	ENVC	0.000	ENVC
N+3.60	B30	V35X50	189.000	1.773	ENVC	1.773	ENVC	0.000	ENVC
N+3.60	B30	V35X50	215.500	1.773	ENVC	1.773	ENVC	0.000	ENVC
N+3.60	B30	V35X50	235.000	1.773	ENVC	1.773	ENVC	0.000	ENVC
N+3.60	B30	V35X50	235.000	1.773	ENVC	1.773	ENVC	0.000	ENVC
N+3.60	B30	V35X50	242.000	1.773	ENVC	1.773	ENVC	0.000	ENVC
N+3.60	B30	V35X50	268.500	1.773	ENVC	1.773	ENVC	0.000	ENVC
N+3.60	B30	V35X50	295.000	0.000	ENVC	0.000	ENVC	0.000	ENVC
N+3.60	B31	V35X50	30.000	8.365	ENVC	5.273	ENVC	0.000	ENVC
N+3.60	B31	V35X50	56.500	7.141	ENVC	2.688	ENVC	0.000	ENVC
N+3.60	B31	V35X50	83.000	5.956	ENVC	2.688	ENVC	0.000	ENVC
N+3.60	B31	V35X50	109.500	5.273	ENVC	2.688	ENVC	0.000	ENVC
N+3.60	B31	V35X50	136.000	4.936	ENVC	2.688	ENVC	0.000	ENVC
N+3.60	B31	V35X50	162.500	3.600	ENVC	2.688	ENVC	0.000	ENVC



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 44 DE 64
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N+3.60	B31	V35X50	189.000	2.688	ENVC	2.688	ENVC	0.000	ENVC
N+3.60	B31	V35X50	215.500	2.688	ENVC	2.688	ENVC	0.000	ENVC
N+3.60	B31	V35X50	235.000	2.688	ENVC	2.688	ENVC	0.000	ENVC
N+3.60	B31	V35X50	235.000	2.688	ENVC	2.688	ENVC	0.000	ENVC
N+3.60	B31	V35X50	242.000	2.688	ENVC	2.688	ENVC	0.000	ENVC
N+3.60	B31	V35X50	268.500	2.688	ENVC	2.688	ENVC	0.000	ENVC
N+3.60	B31	V35X50	295.000	0.000	ENVC	0.000	ENVC	0.000	ENVC
N+3.60	B32	V30X50	22.500	7.359	ENVC	4.520	ENVC	0.000	ENVC
N+3.60	B32	V30X50	49.750	6.331	C2	2.362	ENVC	0.000	ENVC
N+3.60	B32	V30X50	77.000	5.339	ENVC	2.362	ENVC	0.000	ENVC
N+3.60	B32	V30X50	104.250	4.520	ENVC	2.362	ENVC	0.000	ENVC
N+3.60	B32	V30X50	131.500	4.520	ENVC	2.362	ENVC	0.000	ENVC
N+3.60	B32	V30X50	158.750	3.411	ENVC	2.362	ENVC	0.000	ENVC
N+3.60	B32	V30X50	186.000	2.362	ENVC	2.362	ENVC	0.000	ENVC
N+3.60	B32	V30X50	213.250	2.362	ENVC	2.362	ENVC	0.000	ENVC
N+3.60	B32	V30X50	235.000	2.362	ENVC	2.362	ENVC	0.000	ENVC
N+3.60	B32	V30X50	235.000	2.362	ENVC	2.362	ENVC	0.000	ENVC
N+3.60	B32	V30X50	240.500	2.362	ENVC	2.362	ENVC	0.000	ENVC
N+3.60	B32	V30X50	267.750	2.362	ENVC	2.362	ENVC	0.000	ENVC
N+3.60	B32	V30X50	295.000	0.000	ENVC	0.000	ENVC	0.000	ENVC
N+3.60	B33	V30X50	0.000	0.000	ENVC	0.000	ENVC	6.361	C14
N+3.60	B33	V30X50	36.035	1.854	ENVC	1.854	ENVC	6.361	C14
N+3.60	B33	V30X50	72.069	1.854	ENVC	1.854	ENVC	6.361	C14
N+3.60	B33	V30X50	108.104	1.854	ENVC	1.854	ENVC	6.361	C14
N+3.60	B33	V30X50	144.138	1.854	ENVC	1.854	ENVC	6.361	C14
N+3.60	B33	V30X50	180.173	1.854	ENVC	1.854	ENVC	6.361	C14
N+3.60	B33	V30X50	216.207	1.854	ENVC	1.854	ENVC	6.361	C14
N+3.60	B33	V30X50	252.242	2.722	ENVC	1.854	ENVC	6.361	C14
N+3.60	B33	V30X50	288.276	4.088	ENVC	1.854	ENVC	6.361	C14
N+3.60	B33	V30X50	324.311	4.520	ENVC	1.854	ENVC	6.361	C14
N+3.60	B33	V30X50	360.345	5.726	ENVC	3.743	ENVC	6.361	C14
N+3.60	B34	V30X50	13.655	5.526	ENVC	3.615	ENVC	6.361	C18
N+3.60	B34	V30X50	53.590	4.520	ENVC	1.791	ENVC	6.361	C18
N+3.60	B34	V30X50	93.524	3.440	ENVC	1.791	ENVC	6.361	C18
N+3.60	B34	V30X50	133.459	1.972	ENVC	1.791	ENVC	6.361	C18
N+3.60	B34	V30X50	173.393	1.791	ENVC	1.791	ENVC	6.361	C18
N+3.60	B34	V30X50	213.328	1.791	ENVC	1.931	C2	6.361	C18
N+3.60	B34	V30X50	253.262	1.791	ENVC	2.165	C2	6.361	C18
N+3.60	B34	V30X50	293.197	1.791	ENVC	2.087	C2	6.361	C18
N+3.60	B34	V30X50	333.131	1.791	ENVC	1.791	ENVC	6.361	C18
N+3.60	B34	V30X50	373.066	1.791	ENVC	1.791	ENVC	6.361	C18
N+3.60	B34	V30X50	413.000	0.000	ENVC	0.000	ENVC	6.361	C18
N+3.60	B35	V30X50	0.000	0.000	ENVC	0.000	ENVC	6.215	C14
N+3.60	B35	V30X50	17.335	2.069	ENVC	2.069	ENVC	6.215	C14
N+3.60	B35	V30X50	34.669	2.069	ENVC	2.069	ENVC	6.215	C14
N+3.60	B35	V30X50	52.004	2.069	ENVC	2.069	ENVC	6.215	C14
N+3.60	B35	V30X50	69.338	2.662	ENVC	2.069	ENVC	6.215	C14
N+3.60	B35	V30X50	86.673	3.478	ENVC	2.069	ENVC	6.215	C14
N+3.60	B35	V30X50	104.007	4.358	ENVC	2.069	ENVC	6.215	C14
N+3.60	B35	V30X50	121.342	4.520	ENVC	2.069	ENVC	6.215	C14
N+3.60	B35	V30X50	138.676	4.737	ENVC	2.069	ENVC	6.215	C14
N+3.60	B35	V30X50	156.011	5.548	ENVC	2.069	ENVC	6.215	C14
N+3.60	B35	V30X50	173.345	6.413	ENVC	4.182	ENVC	6.215	C14
N+3.60	B36	V30X50	13.655	5.865	ENVC	3.832	ENVC	0.000	ENVC
N+3.60	B36	V30X50	70.924	4.520	ENVC	1.898	ENVC	0.000	ENVC
N+3.60	B36	V30X50	128.193	1.975	ENVC	1.898	ENVC	0.000	ENVC
N+3.60	B36	V30X50	185.462	1.898	ENVC	2.961	C2	0.000	ENVC
N+3.60	B36	V30X50	242.731	1.898	ENVC	4.095	C2	0.000	ENVC
N+3.60	B36	V30X50	300.000	1.898	ENVC	4.520	C2	0.000	ENVC
N+3.60	B36	V30X50	357.269	1.898	ENVC	4.410	C2	0.000	ENVC
N+3.60	B36	V30X50	414.538	1.898	ENVC	3.584	C2	0.000	ENVC
N+3.60	B36	V30X50	471.807	1.898	ENVC	2.121	C2	0.000	ENVC
N+3.60	B36	V30X50	529.076	2.203	ENVC	1.898	ENVC	0.000	ENVC
N+3.60	B36	V30X50	586.345	4.520	ENVC	2.443	ENVC	0.000	ENVC




Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 45 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B37	V30X50	13.655	4.520	ENVC	2.764	ENVC	0.000	ENVC
N+3.60	B37	V30X50	70.924	2.621	ENVC	1.601	ENVC	0.000	ENVC
N+3.60	B37	V30X50	128.193	1.601	ENVC	1.967	C2	0.000	ENVC
N+3.60	B37	V30X50	185.462	1.601	ENVC	3.601	C2	0.000	ENVC
N+3.60	B37	V30X50	242.731	1.601	ENVC	4.520	C2	0.000	ENVC
N+3.60	B37	V30X50	300.000	1.601	ENVC	4.520	C2	0.000	ENVC
N+3.60	B37	V30X50	357.269	1.601	ENVC	4.520	C2	0.000	ENVC
N+3.60	B37	V30X50	414.538	1.601	ENVC	3.668	C2	0.000	ENVC
N+3.60	B37	V30X50	471.807	1.601	ENVC	2.067	C2	0.000	ENVC
N+3.60	B37	V30X50	529.076	3.510	ENVC	1.601	ENVC	0.000	ENVC
N+3.60	B37	V30X50	586.345	4.925	ENVC	3.229	ENVC	0.000	ENVC
N+3.60	B38	V30X50	13.655	5.280	ENVC	3.457	ENVC	6.361	C14
N+3.60	B38	V30X50	30.990	4.539	ENVC	1.714	ENVC	6.361	C14
N+3.60	B38	V30X50	48.324	4.520	ENVC	1.714	ENVC	6.361	C14
N+3.60	B38	V30X50	65.659	4.278	ENVC	1.714	ENVC	6.361	C14
N+3.60	B38	V30X50	82.993	3.487	ENVC	1.714	ENVC	6.361	C14
N+3.60	B38	V30X50	100.328	2.758	ENVC	1.714	ENVC	6.361	C14
N+3.60	B38	V30X50	117.662	2.090	ENVC	1.714	ENVC	6.361	C14
N+3.60	B38	V30X50	134.997	1.714	ENVC	1.714	ENVC	6.361	C14
N+3.60	B38	V30X50	152.331	1.714	ENVC	1.714	ENVC	6.361	C14
N+3.60	B38	V30X50	169.666	1.714	ENVC	1.714	ENVC	6.361	C14
N+3.60	B38	V30X50	187.000	0.000	C2	0.000	C2	6.361	C14
N+3.60	B39	V30X50	0.000	0.000	ENVC	0.000	ENVC	6.361	C18
N+3.60	B39	V30X50	39.935	1.578	ENVC	1.578	ENVC	6.361	C18
N+3.60	B39	V30X50	79.869	1.578	ENVC	1.899	C2	6.361	C18
N+3.60	B39	V30X50	119.804	1.578	ENVC	2.392	C2	6.361	C18
N+3.60	B39	V30X50	159.738	1.578	ENVC	2.572	C2	6.361	C18
N+3.60	B39	V30X50	199.673	1.578	ENVC	2.439	C2	6.361	C18
N+3.60	B39	V30X50	239.607	1.578	ENVC	1.993	C2	6.361	C18
N+3.60	B39	V30X50	279.542	1.578	ENVC	1.578	ENVC	6.361	C18
N+3.60	B39	V30X50	319.476	2.746	ENVC	1.578	ENVC	6.361	C18
N+3.60	B39	V30X50	359.411	4.438	ENVC	1.578	ENVC	6.361	C18
N+3.60	B39	V30X50	399.345	4.850	ENVC	3.180	ENVC	6.361	C18
N+3.60	B40	V30X50	13.655	5.026	ENVC	3.294	ENVC	6.361	C1
N+3.60	B40	V30X50	49.690	4.520	ENVC	1.633	ENVC	6.361	C1
N+3.60	B40	V30X50	85.724	3.368	ENVC	1.633	ENVC	6.361	C1
N+3.60	B40	V30X50	121.759	2.100	ENVC	1.633	ENVC	6.361	C1
N+3.60	B40	V30X50	157.793	1.633	ENVC	1.633	ENVC	6.361	C1
N+3.60	B40	V30X50	193.828	1.633	ENVC	1.695	C2	6.361	C1
N+3.60	B40	V30X50	229.862	1.633	ENVC	1.860	C2	6.361	C1
N+3.60	B40	V30X50	265.897	1.633	ENVC	1.771	C2	6.361	C1
N+3.60	B40	V30X50	301.931	1.633	ENVC	1.633	ENVC	6.361	C1
N+3.60	B40	V30X50	337.966	1.633	ENVC	1.633	ENVC	6.361	C1
N+3.60	B40	V30X50	374.000	0.000	ENVC	0.000	ENVC	6.361	C1
N+3.60	B41	V35X50	13.655	1.589	ENVC	0.792	ENVC	0.000	ENVC
N+3.60	B41	V35X50	18.290	1.425	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B41	V35X50	22.924	1.263	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B41	V35X50	27.559	1.101	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B41	V35X50	32.193	0.941	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B41	V35X50	36.828	0.781	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B41	V35X50	41.462	0.623	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B41	V35X50	46.097	0.466	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B41	V35X50	50.731	0.395	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B41	V35X50	55.366	0.395	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B41	V35X50	60.000	0.000	ENVC	0.000	ENVC	0.000	ENVC
N+3.60	B42	V35X50	13.655	1.589	ENVC	0.792	ENVC	0.000	ENVC
N+3.60	B42	V35X50	18.290	1.425	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B42	V35X50	22.924	1.263	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B42	V35X50	27.559	1.101	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B42	V35X50	32.193	0.941	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B42	V35X50	36.828	0.781	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B42	V35X50	41.462	0.623	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B42	V35X50	46.097	0.466	ENVC	0.395	ENVC	0.000	ENVC



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
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Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 46 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B42	V35X50	50.731	0.395	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B42	V35X50	55.366	0.395	ENVC	0.395	ENVC	0.000	ENVC
N+3.60	B42	V35X50	60.000	0.000	ENVC	0.000	ENVC	0.000	ENVC
N+3.60	B43	V30X50	13.655	4.520	ENVC	2.853	ENVC	0.000	ENVC
N+3.60	B43	V30X50	70.924	2.837	ENVC	1.472	ENVC	0.000	ENVC
N+3.60	B43	V30X50	128.193	1.472	ENVC	1.841	C2	0.000	ENVC
N+3.60	B43	V30X50	185.462	1.472	ENVC	3.437	C2	0.000	ENVC
N+3.60	B43	V30X50	242.731	1.472	ENVC	4.399	C2	0.000	ENVC
N+3.60	B43	V30X50	300.000	1.472	ENVC	4.520	C2	0.000	ENVC
N+3.60	B43	V30X50	357.269	1.472	ENVC	4.361	C2	0.000	ENVC
N+3.60	B43	V30X50	414.538	1.472	ENVC	3.361	C2	0.000	ENVC
N+3.60	B43	V30X50	471.807	1.472	ENVC	1.729	C2	0.000	ENVC
N+3.60	B43	V30X50	529.076	3.020	ENVC	1.472	ENVC	0.000	ENVC
N+3.60	B43	V30X50	586.345	4.520	ENVC	2.966	ENVC	0.000	ENVC
N+3.60	B44	V35X50	22.500	5.054	ENVC	2.499	ENVC	5.889	ENVC
N+3.60	B44	V35X50	61.250	2.259	ENVC	1.842	ENVC	5.889	ENVC
N+3.60	B44	V35X50	100.000	1.842	ENVC	2.563	ENVC	5.889	ENVC
N+3.60	B44	V35X50	100.000	1.842	ENVC	2.610	ENVC	0.000	ENVC
N+3.60	B44	V35X50	146.250	1.842	ENVC	3.196	ENVC	0.000	ENVC
N+3.60	B44	V35X50	192.500	1.842	ENVC	3.780	C2	0.000	ENVC
N+3.60	B44	V35X50	238.750	1.842	ENVC	4.094	C2	0.000	ENVC
N+3.60	B44	V35X50	285.000	1.842	ENVC	4.036	C2	0.000	ENVC
N+3.60	B44	V35X50	331.250	1.842	ENVC	3.605	C2	0.000	ENVC
N+3.60	B44	V35X50	377.500	1.842	ENVC	2.936	ENVC	0.000	ENVC
N+3.60	B44	V35X50	423.750	1.842	ENVC	2.205	ENVC	0.000	ENVC
N+3.60	B44	V35X50	470.000	2.596	ENVC	1.842	ENVC	0.000	ENVC
N+3.60	B44	V35X50	516.250	4.866	ENVC	1.842	ENVC	0.000	ENVC
N+3.60	B44	V35X50	562.500	5.664	ENVC	3.714	ENVC	0.000	ENVC
N+3.60	B45	V15X50	0.000	2.260	ENVC	1.201	ENVC	0.000	ENVC
N+3.60	B45	V15X50	50.000	1.720	ENVC	0.597	ENVC	0.000	ENVC
N+3.60	B45	V15X50	100.000	1.110	ENVC	0.597	ENVC	0.000	ENVC
N+3.60	B45	V15X50	150.000	0.598	ENVC	0.597	ENVC	0.000	ENVC
N+3.60	B45	V15X50	200.000	0.597	ENVC	0.597	ENVC	0.000	ENVC
N+3.60	B45	V15X50	250.000	0.597	ENVC	0.597	ENVC	0.000	ENVC
N+3.60	B45	V15X50	300.000	0.597	ENVC	0.597	ENVC	0.000	ENVC
N+3.60	B45	V15X50	350.000	0.597	ENVC	0.597	ENVC	0.000	ENVC
N+3.60	B45	V15X50	400.000	0.597	ENVC	0.597	ENVC	0.000	ENVC
N+3.60	B45	V15X50	450.000	0.597	ENVC	0.597	ENVC	0.000	ENVC
N+3.60	B45	V15X50	500.000	0.597	ENVC	0.597	ENVC	0.000	ENVC
N+3.60	B45	V15X50	550.000	0.812	ENVC	0.597	ENVC	0.000	ENVC
N+3.60	B45	V15X50	600.000	1.328	ENVC	0.660	ENVC	0.000	ENVC
N+3.60	B46	V25X50	0.000	3.459	ENVC	1.711	ENVC	0.000	ENVC
N+3.60	B46	V25X50	48.750	1.243	ENVC	0.851	ENVC	0.000	ENVC
N+3.60	B46	V25X50	97.500	0.851	ENVC	1.751	C2	0.000	ENVC
N+3.60	B46	V25X50	146.250	0.851	ENVC	3.162	C2	0.000	ENVC
N+3.60	B46	V25X50	195.000	0.851	ENVC	3.766	ENVC	0.000	ENVC
N+3.60	B46	V25X50	243.750	0.851	ENVC	3.766	ENVC	0.000	ENVC
N+3.60	B46	V25X50	292.500	0.851	ENVC	3.843	C2	0.000	ENVC
N+3.60	B46	V25X50	341.250	0.851	ENVC	3.766	ENVC	0.000	ENVC
N+3.60	B46	V25X50	390.000	0.851	ENVC	3.766	ENVC	0.000	ENVC
N+3.60	B46	V25X50	438.750	0.851	ENVC	3.543	C2	0.000	ENVC
N+3.60	B46	V25X50	487.500	0.851	ENVC	2.251	C2	0.000	ENVC
N+3.60	B46	V25X50	536.250	0.851	ENVC	0.851	ENVC	0.000	ENVC
N+3.60	B46	V25X50	585.000	2.475	ENVC	1.228	ENVC	0.000	ENVC
N+3.60	B47	V25X50	0.000	3.054	ENVC	1.513	ENVC	0.000	ENVC
N+3.60	B47	V25X50	48.750	0.875	ENVC	0.753	ENVC	0.000	ENVC
N+3.60	B47	V25X50	97.500	0.753	ENVC	1.943	C2	0.000	ENVC
N+3.60	B47	V25X50	146.250	0.753	ENVC	3.360	C2	0.000	ENVC
N+3.60	B47	V25X50	195.000	0.753	ENVC	3.766	ENVC	0.000	ENVC
N+3.60	B47	V25X50	243.750	0.753	ENVC	3.803	C2	0.000	ENVC
N+3.60	B47	V25X50	292.500	0.753	ENVC	4.004	C2	0.000	ENVC
N+3.60	B47	V25X50	341.250	0.753	ENVC	3.906	C2	0.000	ENVC
N+3.60	B47	V25X50	390.000	0.753	ENVC	3.766	ENVC	0.000	ENVC
N+3.60	B47	V25X50	438.750	0.753	ENVC	3.763	C2	0.000	ENVC

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
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	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 47 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B47	V25X50	487.500	0.753	ENVC	2.471	C2	0.000	ENVC
N+3.60	B47	V25X50	536.250	0.753	ENVC	0.820	C2	0.000	ENVC
N+3.60	B47	V25X50	585.000	1.903	ENVC	0.946	ENVC	0.000	ENVC

RESISTENCIA AL CORTANTE DE VIGAS (C.21.3.3.1.b)

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C O N C R E T E B E A M D E S I G N O U T P U T (ACI 318-08/IBC 2009)

TORSION AND SHEAR DESIGN OF BEAM-TYPE ELEMENTS

STORY ID	BEAM BAY	SECTION ID	STATION ID	<-----REQUIRED REINFORCING----->			
				TORSION	COMBO	SHEAR	COMBO
N+3.60	B1	V15X50	0.000	0.000	VNV16	0.010	VNV16
N+3.60	B1	V15X50	78.700	0.000	VNV16	0.009	VNV16
N+3.60	B1	V15X50	157.400	0.000	VNV16	0.008	VNV16
N+3.60	B1	V15X50	236.100	0.000	VNV16	0.007	VNV16
N+3.60	B1	V15X50	314.800	0.000	VNV16	0.007	VNV16
N+3.60	B1	V15X50	393.500	0.000	VNV16	0.007	VNV16
N+3.60	B1	V15X50	472.200	0.000	VNV16	0.008	VNV16
N+3.60	B1	V15X50	550.900	0.000	VNV16	0.009	VNV16
N+3.60	B1	V15X50	629.600	0.000	VNV16	0.010	VNV16
N+3.60	B1	V15X50	708.300	0.000	VNV16	0.011	VNV16
N+3.60	B1	V15X50	787.000	0.000	VNV16	0.012	VNV16
N+3.60	B2	V15X50	0.000	0.000	VNV16	0.000	VNV16
N+3.60	B2	V15X50	78.700	0.000	VNV16	0.000	VNV16
N+3.60	B2	V15X50	157.400	0.000	VNV16	0.000	VNV16
N+3.60	B2	V15X50	236.100	0.000	VNV16	0.000	VNV16
N+3.60	B2	V15X50	314.800	0.000	VNV16	0.000	VNV16
N+3.60	B2	V15X50	393.500	0.000	VNV16	0.000	VNV16
N+3.60	B2	V15X50	472.200	0.000	VNV16	0.000	VNV16
N+3.60	B2	V15X50	550.900	0.000	VNV16	0.000	VNV16
N+3.60	B2	V15X50	629.600	0.000	VNV16	0.000	VNV16
N+3.60	B2	V15X50	708.300	0.000	VNV16	0.000	VNV16
N+3.60	B2	V15X50	787.000	0.000	VNV16	0.000	VNV16
N+3.60	B3	V15X50	0.000	0.000	VNV16	0.000	VNV16
N+3.60	B3	V15X50	78.700	0.000	VNV16	0.000	VNV16
N+3.60	B3	V15X50	157.400	0.000	VNV16	0.000	VNV16
N+3.60	B3	V15X50	236.100	0.000	VNV16	0.000	VNV16
N+3.60	B3	V15X50	314.800	0.000	VNV16	0.000	VNV16
N+3.60	B3	V15X50	393.500	0.000	VNV16	0.000	VNV16
N+3.60	B3	V15X50	472.200	0.000	VNV16	0.000	VNV16
N+3.60	B3	V15X50	550.900	0.000	VNV16	0.000	VNV16
N+3.60	B3	V15X50	629.600	0.000	VNV16	0.000	VNV16
N+3.60	B3	V15X50	708.300	0.000	VNV16	0.000	VNV16
N+3.60	B3	V15X50	787.000	0.000	VNV16	0.000	VNV16
N+3.60	B4	V15X50	0.000	0.000	VNV16	0.011	VNV16
N+3.60	B4	V15X50	78.700	0.000	VNV16	0.010	VNV16
N+3.60	B4	V15X50	157.400	0.000	VNV16	0.009	VNV16
N+3.60	B4	V15X50	236.100	0.000	VNV16	0.008	VNV16
N+3.60	B4	V15X50	314.800	0.000	VNV16	0.007	VNV16
N+3.60	B4	V15X50	393.500	0.000	VNV16	0.007	VNV16
N+3.60	B4	V15X50	472.200	0.000	VNV16	0.006	VNV16
N+3.60	B4	V15X50	550.900	0.000	VNV16	0.007	VNV16
N+3.60	B4	V15X50	629.600	0.000	VNV16	0.008	VNV16
N+3.60	B4	V15X50	708.300	0.000	VNV16	0.009	VNV16
N+3.60	B4	V15X50	787.000	0.000	VNV16	0.010	VNV16
N+3.60	B5	V30X50	0.000	0.039	VNV4	0.050	VNV16
N+3.60	B5	V30X50	15.750	0.039	VNV4	0.053	VNV16
N+3.60	B5	V30X50	31.500	0.039	VNV4	0.056	VNV16



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 48 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B5	V30X50	47.250	0.039	VNV4	0.059	VNV16
N+3.60	B5	V30X50	63.000	0.039	VNV4	0.063	VNV16
N+3.60	B5	V30X50	78.750	0.039	VNV4	0.066	VNV16
N+3.60	B5	V30X50	94.500	0.039	VNV4	0.069	VNV16
N+3.60	B5	V30X50	110.250	0.039	VNV4	0.072	VNV16
N+3.60	B5	V30X50	126.000	0.039	VNV4	0.075	VNV16
N+3.60	B5	V30X50	141.750	0.039	VNV4	0.078	VNV16
N+3.60	B5	V30X50	157.500	0.039	VNV4	0.081	VNV16
N+3.60	B6	V35X50	0.000	0.030	VNV4	0.097	VNV16
N+3.60	B6	V35X50	15.750	0.030	VNV4	0.103	VNV16
N+3.60	B6	V35X50	31.500	0.030	VNV4	0.109	VNV16
N+3.60	B6	V35X50	47.250	0.030	VNV4	0.115	VNV16
N+3.60	B6	V35X50	63.000	0.030	VNV4	0.121	VNV16
N+3.60	B6	V35X50	78.750	0.030	VNV4	0.126	VNV16
N+3.60	B6	V35X50	94.500	0.030	VNV4	0.132	VNV16
N+3.60	B6	V35X50	110.250	0.030	VNV4	0.138	VNV16
N+3.60	B6	V35X50	126.000	0.030	VNV4	0.144	VNV16
N+3.60	B6	V35X50	141.750	0.030	VNV4	0.150	VNV16
N+3.60	B6	V35X50	157.500	0.030	VNV4	0.156	VNV16
N+3.60	B7	V35X50	0.000	0.024	VNV4	0.058	VNV16
N+3.60	B7	V35X50	15.750	0.024	VNV4	0.061	VNV16
N+3.60	B7	V35X50	31.500	0.024	VNV4	0.065	VNV16
N+3.60	B7	V35X50	47.250	0.024	VNV4	0.068	VNV16
N+3.60	B7	V35X50	63.000	0.024	VNV4	0.071	VNV16
N+3.60	B7	V35X50	78.750	0.024	VNV4	0.074	VNV16
N+3.60	B7	V35X50	94.500	0.024	VNV4	0.077	VNV16
N+3.60	B7	V35X50	110.250	0.024	VNV4	0.080	VNV16
N+3.60	B7	V35X50	126.000	0.024	VNV4	0.084	VNV16
N+3.60	B7	V35X50	141.750	0.024	VNV4	0.087	VNV16
N+3.60	B7	V35X50	157.500	0.024	VNV4	0.090	VNV16
N+3.60	B8	V35X50	0.000	0.027	VNV4	0.058	VNV16
N+3.60	B8	V35X50	15.750	0.027	VNV4	0.061	VNV16
N+3.60	B8	V35X50	31.500	0.027	VNV4	0.064	VNV16
N+3.60	B8	V35X50	47.250	0.027	VNV4	0.067	VNV16
N+3.60	B8	V35X50	63.000	0.027	VNV4	0.071	VNV16
N+3.60	B8	V35X50	78.750	0.027	VNV4	0.074	VNV16
N+3.60	B8	V35X50	94.500	0.027	VNV4	0.077	VNV16
N+3.60	B8	V35X50	110.250	0.027	VNV4	0.080	VNV16
N+3.60	B8	V35X50	126.000	0.027	VNV4	0.083	VNV16
N+3.60	B8	V35X50	141.750	0.027	VNV4	0.086	VNV16
N+3.60	B8	V35X50	157.500	0.027	VNV4	0.090	VNV16
N+3.60	B9	V35X50	0.000	0.029	VNV4	0.096	VNV16
N+3.60	B9	V35X50	15.750	0.029	VNV4	0.102	VNV16
N+3.60	B9	V35X50	31.500	0.029	VNV4	0.108	VNV16
N+3.60	B9	V35X50	47.250	0.029	VNV4	0.114	VNV16
N+3.60	B9	V35X50	63.000	0.029	VNV4	0.120	VNV16
N+3.60	B9	V35X50	78.750	0.029	VNV4	0.126	VNV16
N+3.60	B9	V35X50	94.500	0.029	VNV4	0.131	VNV16
N+3.60	B9	V35X50	110.250	0.029	VNV4	0.137	VNV16
N+3.60	B9	V35X50	126.000	0.029	VNV4	0.143	VNV16
N+3.60	B9	V35X50	141.750	0.029	VNV4	0.149	VNV16
N+3.60	B9	V35X50	157.500	0.029	VNV4	0.155	VNV16
N+3.60	B10	V30X50	0.000	0.038	VNV4	0.050	VNV16
N+3.60	B10	V30X50	15.750	0.038	VNV4	0.053	VNV16
N+3.60	B10	V30X50	31.500	0.038	VNV4	0.056	VNV16
N+3.60	B10	V30X50	47.250	0.038	VNV4	0.059	VNV16
N+3.60	B10	V30X50	63.000	0.038	VNV4	0.062	VNV16
N+3.60	B10	V30X50	78.750	0.038	VNV4	0.066	VNV16
N+3.60	B10	V30X50	94.500	0.038	VNV4	0.069	VNV16
N+3.60	B10	V30X50	110.250	0.038	VNV4	0.072	VNV16
N+3.60	B10	V30X50	126.000	0.038	VNV4	0.075	VNV16
N+3.60	B10	V30X50	141.750	0.038	VNV4	0.078	VNV16
N+3.60	B10	V30X50	157.500	0.038	VNV4	0.081	VNV16



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 49 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B12	V30X50	17.500	0.035	VNV8	0.000	VNV16
N+3.60	B12	V30X50	92.700	0.035	VNV8	0.000	VNV16
N+3.60	B12	V30X50	167.900	0.035	VNV8	0.000	VNV16
N+3.60	B12	V30X50	243.100	0.035	VNV8	0.000	VNV16
N+3.60	B12	V30X50	318.300	0.035	VNV8	0.000	VNV16
N+3.60	B12	V30X50	393.500	0.035	VNV8	0.000	VNV16
N+3.60	B12	V30X50	468.700	0.035	VNV8	0.000	VNV16
N+3.60	B12	V30X50	543.900	0.035	VNV8	0.000	VNV16
N+3.60	B12	V30X50	572.000	0.035	VNV8	0.000	VNV16
N+3.60	B13	V30X50	17.500	0.000	VNV16	0.052	VNV8
N+3.60	B13	V30X50	74.000	0.000	VNV16	0.049	VNV8
N+3.60	B13	V30X50	130.500	0.000	VNV16	0.045	VNV8
N+3.60	B13	V30X50	187.000	0.000	VNV16	0.042	VNV8
N+3.60	B13	V30X50	243.500	0.000	VNV16	0.038	VNV8
N+3.60	B13	V30X50	300.000	0.000	VNV16	0.035	VNV8
N+3.60	B13	V30X50	356.500	0.000	VNV16	0.031	VNV8
N+3.60	B13	V30X50	413.000	0.000	VNV16	0.033	VNV8
N+3.60	B13	V30X50	469.500	0.000	VNV16	0.036	VNV8
N+3.60	B13	V30X50	526.000	0.000	VNV16	0.040	VNV8
N+3.60	B13	V30X50	582.500	0.000	VNV16	0.043	VNV8
N+3.60	B14	V30X50	17.500	0.000	VNV16	0.027	VNV8
N+3.60	B14	V30X50	92.700	0.000	VNV16	0.024	VNV8
N+3.60	B14	V30X50	167.900	0.000	VNV16	0.022	VNV8
N+3.60	B14	V30X50	243.100	0.000	VNV16	0.020	VNV8
N+3.60	B14	V30X50	318.300	0.000	VNV16	0.017	VNV8
N+3.60	B14	V30X50	393.500	0.000	VNV16	0.017	VNV8
N+3.60	B14	V30X50	468.700	0.000	VNV16	0.019	VNV8
N+3.60	B14	V30X50	543.900	0.000	VNV16	0.021	VNV8
N+3.60	B14	V30X50	619.100	0.000	VNV16	0.024	VNV8
N+3.60	B14	V30X50	694.300	0.000	VNV16	0.026	VNV8
N+3.60	B14	V30X50	769.500	0.000	VNV16	0.028	VNV8
N+3.60	B15	V30X50	17.500	0.000	VNV16	0.033	VNV8
N+3.60	B15	V30X50	92.700	0.000	VNV16	0.031	VNV8
N+3.60	B15	V30X50	167.900	0.000	VNV16	0.028	VNV8
N+3.60	B15	V30X50	243.100	0.000	VNV16	0.026	VNV8
N+3.60	B15	V30X50	318.300	0.000	VNV16	0.024	VNV8
N+3.60	B15	V30X50	393.500	0.000	VNV16	0.022	VNV8
N+3.60	B15	V30X50	468.700	0.000	VNV16	0.021	VNV8
N+3.60	B15	V30X50	543.900	0.000	VNV16	0.024	VNV8
N+3.60	B15	V30X50	619.100	0.000	VNV16	0.026	VNV8
N+3.60	B15	V30X50	694.300	0.000	VNV16	0.028	VNV8
N+3.60	B15	V30X50	769.500	0.000	VNV16	0.030	VNV8
N+3.60	B16	V30X50	22.500	0.013	VNV8	0.066	VNV8
N+3.60	B16	V30X50	76.500	0.013	VNV8	0.060	VNV8
N+3.60	B16	V30X50	130.500	0.013	VNV8	0.054	VNV8
N+3.60	B16	V30X50	184.500	0.013	VNV8	0.048	VNV8
N+3.60	B16	V30X50	238.500	0.013	VNV8	0.042	VNV8
N+3.60	B16	V30X50	292.500	0.013	VNV8	0.039	VNV8
N+3.60	B16	V30X50	346.500	0.013	VNV8	0.045	VNV8
N+3.60	B16	V30X50	400.500	0.013	VNV8	0.051	VNV8
N+3.60	B16	V30X50	454.500	0.013	VNV8	0.056	VNV8
N+3.60	B16	V30X50	508.500	0.013	VNV8	0.062	VNV8
N+3.60	B16	V30X50	562.500	0.013	VNV8	0.068	VNV8
N+3.60	B17	V35X50	22.500	0.000	VNV16	0.072	VNV8
N+3.60	B17	V35X50	75.750	0.000	VNV16	0.069	VNV8
N+3.60	B17	V35X50	129.000	0.000	VNV16	0.065	VNV8
N+3.60	B17	V35X50	182.250	0.000	VNV16	0.061	VNV8
N+3.60	B17	V35X50	235.500	0.000	VNV16	0.058	VNV8
N+3.60	B17	V35X50	288.750	0.000	VNV16	0.054	VNV8
N+3.60	B17	V35X50	342.000	0.000	VNV16	0.051	VNV8
N+3.60	B17	V35X50	395.250	0.000	VNV16	0.048	VNV16
N+3.60	B17	V35X50	448.500	0.000	VNV16	0.049	VNV8
N+3.60	B17	V35X50	501.750	0.000	VNV16	0.052	VNV8
N+3.60	B17	V35X50	555.000	0.000	VNV16	0.056	VNV8



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 50 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B19	V35X50	22.500	0.000	VNV16	0.073	VNV8
N+3.60	B19	V35X50	76.500	0.000	VNV16	0.054	VNV8
N+3.60	B19	V35X50	130.500	0.000	VNV16	0.035	VNV8
N+3.60	B19	V35X50	184.500	0.000	VNV16	0.016	VNV8
N+3.60	B19	V35X50	238.500	0.000	VNV16	0.000	VNV16
N+3.60	B19	V35X50	292.500	0.000	VNV16	0.000	VNV16
N+3.60	B19	V35X50	346.500	0.000	VNV16	0.000	VNV16
N+3.60	B19	V35X50	400.500	0.000	VNV16	0.009	VNV8
N+3.60	B19	V35X50	454.500	0.000	VNV16	0.028	VNV8
N+3.60	B19	V35X50	485.000	0.000	VNV16	0.039	VNV8
N+3.60	B19	V35X50	485.000	0.037	VNV4	0.047	VNV8
N+3.60	B19	V35X50	508.500	0.037	VNV4	0.060	VNV8
N+3.60	B19	V35X50	562.500	0.037	VNV4	0.096	VNV8
N+3.60	B20	V35X50	22.500	0.000	VNV16	0.172	VNV8
N+3.60	B20	V35X50	75.750	0.000	VNV16	0.135	VNV8
N+3.60	B20	V35X50	129.000	0.000	VNV16	0.103	VNV8
N+3.60	B20	V35X50	182.250	0.000	VNV16	0.070	VNV8
N+3.60	B20	V35X50	235.500	0.000	VNV16	0.038	VNV8
N+3.60	B20	V35X50	288.750	0.000	VNV16	0.005	VNV8
N+3.60	B20	V35X50	342.000	0.000	VNV16	0.033	VNV8
N+3.60	B20	V35X50	395.250	0.000	VNV16	0.065	VNV8
N+3.60	B20	V35X50	448.500	0.000	VNV16	0.098	VNV8
N+3.60	B20	V35X50	501.750	0.000	VNV16	0.130	VNV8
N+3.60	B20	V35X50	555.000	0.000	VNV16	0.166	VNV8
N+3.60	B21	V30X50	22.500	0.012	VNV8	0.111	VNV16
N+3.60	B21	V30X50	76.500	0.012	VNV8	0.100	VNV16
N+3.60	B21	V30X50	130.500	0.012	VNV8	0.090	VNV16
N+3.60	B21	V30X50	184.500	0.012	VNV8	0.079	VNV16
N+3.60	B21	V30X50	238.500	0.012	VNV8	0.069	VNV16
N+3.60	B21	V30X50	292.500	0.012	VNV8	0.058	VNV16
N+3.60	B21	V30X50	346.500	0.012	VNV8	0.068	VNV16
N+3.60	B21	V30X50	400.500	0.012	VNV8	0.079	VNV16
N+3.60	B21	V30X50	454.500	0.012	VNV8	0.089	VNV16
N+3.60	B21	V30X50	508.500	0.012	VNV8	0.100	VNV16
N+3.60	B21	V30X50	562.500	0.012	VNV8	0.110	VNV16
N+3.60	B23	V30X50	17.500	0.029	VNV8	0.049	VNV8
N+3.60	B23	V30X50	92.700	0.029	VNV8	0.036	VNV8
N+3.60	B23	V30X50	167.900	0.029	VNV8	0.024	VNV8
N+3.60	B23	V30X50	243.100	0.029	VNV8	0.011	VNV8
N+3.60	B23	V30X50	318.300	0.029	VNV8	0.000	VNV16
N+3.60	B23	V30X50	393.500	0.029	VNV8	0.000	VNV16
N+3.60	B23	V30X50	468.700	0.029	VNV8	0.000	VNV16
N+3.60	B23	V30X50	543.900	0.029	VNV8	0.000	VNV16
N+3.60	B23	V30X50	572.000	0.029	VNV8	0.000	VNV16
N+3.60	B23	V30X50	572.000	0.034	VNV8	0.031	VNV8
N+3.60	B23	V30X50	619.100	0.034	VNV8	0.039	VNV8
N+3.60	B23	V30X50	694.300	0.034	VNV8	0.051	VNV8
N+3.60	B23	V30X50	769.500	0.034	VNV8	0.064	VNV8
N+3.60	B24	V30X50	17.500	0.000	VNV16	0.056	VNV16
N+3.60	B24	V30X50	74.000	0.000	VNV16	0.052	VNV16
N+3.60	B24	V30X50	130.500	0.000	VNV16	0.048	VNV16
N+3.60	B24	V30X50	187.000	0.000	VNV16	0.044	VNV16
N+3.60	B24	V30X50	243.500	0.000	VNV16	0.040	VNV16
N+3.60	B24	V30X50	300.000	0.000	VNV16	0.036	VNV16
N+3.60	B24	V30X50	356.500	0.000	VNV16	0.036	VNV16
N+3.60	B24	V30X50	413.000	0.000	VNV16	0.040	VNV16
N+3.60	B24	V30X50	469.500	0.000	VNV16	0.044	VNV16
N+3.60	B24	V30X50	526.000	0.000	VNV16	0.048	VNV16
N+3.60	B24	V30X50	582.500	0.000	VNV16	0.052	VNV16
N+3.60	B25	V30X50	17.500	0.000	VNV16	0.055	VNV16
N+3.60	B25	V30X50	92.700	0.000	VNV16	0.049	VNV16
N+3.60	B25	V30X50	167.900	0.000	VNV16	0.044	VNV16
N+3.60	B25	V30X50	243.100	0.000	VNV16	0.039	VNV16



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 51 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B25	V30X50	318.300	0.000	VNV16	0.034	VNV16
N+3.60	B25	V30X50	393.500	0.000	VNV16	0.031	VNV16
N+3.60	B25	V30X50	468.700	0.000	VNV16	0.036	VNV16
N+3.60	B25	V30X50	543.900	0.000	VNV16	0.041	VNV16
N+3.60	B25	V30X50	619.100	0.000	VNV16	0.047	VNV16
N+3.60	B25	V30X50	694.300	0.000	VNV16	0.052	VNV16
N+3.60	B25	V30X50	769.500	0.000	VNV16	0.057	VNV16
N+3.60	B26	V30X50	17.500	0.000	VNV16	0.061	VNV16
N+3.60	B26	V30X50	92.700	0.000	VNV16	0.056	VNV16
N+3.60	B26	V30X50	167.900	0.000	VNV16	0.051	VNV16
N+3.60	B26	V30X50	243.100	0.000	VNV16	0.045	VNV16
N+3.60	B26	V30X50	318.300	0.000	VNV16	0.040	VNV16
N+3.60	B26	V30X50	393.500	0.000	VNV16	0.035	VNV16
N+3.60	B26	V30X50	468.700	0.000	VNV16	0.035	VNV16
N+3.60	B26	V30X50	543.900	0.000	VNV16	0.040	VNV16
N+3.60	B26	V30X50	619.100	0.000	VNV16	0.045	VNV16
N+3.60	B26	V30X50	694.300	0.000	VNV16	0.051	VNV16
N+3.60	B26	V30X50	769.500	0.000	VNV16	0.056	VNV16
N+3.60	B27	V35X50	22.500	0.034	VNV4	0.072	VNV8
N+3.60	B27	V35X50	42.384	0.034	VNV4	0.071	VNV8
N+3.60	B27	V35X50	62.269	0.034	VNV4	0.071	VNV8
N+3.60	B27	V35X50	82.153	0.034	VNV4	0.070	VNV8
N+3.60	B27	V35X50	102.038	0.034	VNV4	0.069	VNV8
N+3.60	B27	V35X50	121.922	0.034	VNV4	0.069	VNV8
N+3.60	B27	V35X50	141.807	0.034	VNV4	0.068	VNV8
N+3.60	B27	V35X50	161.691	0.034	VNV4	0.067	VNV8
N+3.60	B27	V35X50	181.576	0.034	VNV4	0.066	VNV8
N+3.60	B27	V35X50	201.460	0.034	VNV4	0.066	VNV8
N+3.60	B27	V35X50	221.345	0.034	VNV4	0.065	VNV8
N+3.60	B28	V35X50	22.500	0.022	VNV4	0.104	VNV8
N+3.60	B28	V35X50	42.384	0.022	VNV4	0.103	VNV8
N+3.60	B28	V35X50	62.269	0.022	VNV4	0.103	VNV8
N+3.60	B28	V35X50	82.153	0.022	VNV4	0.102	VNV8
N+3.60	B28	V35X50	102.038	0.022	VNV4	0.101	VNV8
N+3.60	B28	V35X50	121.922	0.022	VNV4	0.101	VNV8
N+3.60	B28	V35X50	141.807	0.022	VNV4	0.100	VNV8
N+3.60	B28	V35X50	161.691	0.022	VNV4	0.099	VNV8
N+3.60	B28	V35X50	181.576	0.022	VNV4	0.099	VNV8
N+3.60	B28	V35X50	201.460	0.022	VNV4	0.098	VNV8
N+3.60	B28	V35X50	221.345	0.022	VNV4	0.097	VNV8
N+3.60	B29	V30X50	22.500	0.000	VNV16	0.071	VNV8
N+3.60	B29	V30X50	49.750	0.000	VNV16	0.070	VNV8
N+3.60	B29	V30X50	77.000	0.000	VNV16	0.069	VNV8
N+3.60	B29	V30X50	104.250	0.000	VNV16	0.069	VNV8
N+3.60	B29	V30X50	131.500	0.000	VNV16	0.068	VNV8
N+3.60	B29	V30X50	158.750	0.000	VNV16	0.067	VNV8
N+3.60	B29	V30X50	186.000	0.000	VNV16	0.066	VNV8
N+3.60	B29	V30X50	213.250	0.000	VNV16	0.065	VNV8
N+3.60	B29	V30X50	235.000	0.000	VNV16	0.065	VNV8
N+3.60	B29	V30X50	235.000	0.000	VNV16	0.050	VNV8
N+3.60	B29	V30X50	240.500	0.000	VNV16	0.050	VNV8
N+3.60	B29	V30X50	267.750	0.000	VNV16	0.049	VNV8
N+3.60	B29	V30X50	295.000	0.000	VNV16	0.048	VNV8
N+3.60	B30	V35X50	30.000	0.000	VNV16	0.067	VNV8
N+3.60	B30	V35X50	56.500	0.000	VNV16	0.066	VNV8
N+3.60	B30	V35X50	83.000	0.000	VNV16	0.065	VNV8
N+3.60	B30	V35X50	109.500	0.000	VNV16	0.064	VNV8
N+3.60	B30	V35X50	136.000	0.000	VNV16	0.063	VNV8
N+3.60	B30	V35X50	162.500	0.000	VNV16	0.062	VNV8
N+3.60	B30	V35X50	189.000	0.000	VNV16	0.061	VNV8
N+3.60	B30	V35X50	215.500	0.000	VNV16	0.060	VNV8
N+3.60	B30	V35X50	235.000	0.000	VNV16	0.060	VNV8
N+3.60	B30	V35X50	235.000	0.000	VNV16	0.060	VNV8
N+3.60	B30	V35X50	242.000	0.000	VNV16	0.060	VNV8



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 52 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B30	V35X50	268.500	0.000	VNV16	0.059	VNV8
N+3.60	B30	V35X50	295.000	0.000	VNV16	0.058	VNV8
N+3.60	B31	V35X50	30.000	0.000	VNV16	0.098	VNV8
N+3.60	B31	V35X50	56.500	0.000	VNV16	0.097	VNV8
N+3.60	B31	V35X50	83.000	0.000	VNV16	0.096	VNV8
N+3.60	B31	V35X50	109.500	0.000	VNV16	0.095	VNV8
N+3.60	B31	V35X50	136.000	0.000	VNV16	0.094	VNV8
N+3.60	B31	V35X50	162.500	0.000	VNV16	0.093	VNV8
N+3.60	B31	V35X50	189.000	0.000	VNV16	0.092	VNV8
N+3.60	B31	V35X50	215.500	0.000	VNV16	0.092	VNV8
N+3.60	B31	V35X50	235.000	0.000	VNV16	0.091	VNV8
N+3.60	B31	V35X50	235.000	0.000	VNV16	0.079	VNV8
N+3.60	B31	V35X50	242.000	0.000	VNV16	0.079	VNV8
N+3.60	B31	V35X50	268.500	0.000	VNV16	0.078	VNV8
N+3.60	B31	V35X50	295.000	0.000	VNV16	0.077	VNV8
N+3.60	B32	V30X50	22.500	0.000	VNV16	0.080	VNV8
N+3.60	B32	V30X50	49.750	0.000	VNV16	0.080	VNV8
N+3.60	B32	V30X50	77.000	0.000	VNV16	0.079	VNV8
N+3.60	B32	V30X50	104.250	0.000	VNV16	0.078	VNV8
N+3.60	B32	V30X50	131.500	0.000	VNV16	0.077	VNV8
N+3.60	B32	V30X50	158.750	0.000	VNV16	0.076	VNV8
N+3.60	B32	V30X50	186.000	0.000	VNV16	0.075	VNV8
N+3.60	B32	V30X50	213.250	0.000	VNV16	0.075	VNV8
N+3.60	B32	V30X50	235.000	0.000	VNV16	0.074	VNV8
N+3.60	B32	V30X50	235.000	0.000	VNV16	0.056	VNV8
N+3.60	B32	V30X50	240.500	0.000	VNV16	0.056	VNV8
N+3.60	B32	V30X50	267.750	0.000	VNV16	0.055	VNV8
N+3.60	B32	V30X50	295.000	0.000	VNV16	0.054	VNV8
N+3.60	B33	V30X50	0.000	0.028	VNV8	0.038	VNV16
N+3.60	B33	V30X50	36.035	0.028	VNV8	0.035	VNV16
N+3.60	B33	V30X50	72.069	0.028	VNV8	0.032	VNV16
N+3.60	B33	V30X50	108.104	0.028	VNV8	0.032	VNV16
N+3.60	B33	V30X50	144.138	0.028	VNV8	0.035	VNV16
N+3.60	B33	V30X50	180.173	0.028	VNV8	0.038	VNV16
N+3.60	B33	V30X50	216.207	0.028	VNV8	0.041	VNV16
N+3.60	B33	V30X50	252.242	0.028	VNV8	0.044	VNV16
N+3.60	B33	V30X50	288.276	0.028	VNV8	0.047	VNV16
N+3.60	B33	V30X50	324.311	0.028	VNV8	0.050	VNV16
N+3.60	B33	V30X50	360.345	0.028	VNV8	0.052	VNV16
N+3.60	B34	V30X50	13.655	0.020	VNV8	0.060	VNV16
N+3.60	B34	V30X50	53.590	0.020	VNV8	0.056	VNV16
N+3.60	B34	V30X50	93.524	0.020	VNV8	0.053	VNV16
N+3.60	B34	V30X50	133.459	0.020	VNV8	0.050	VNV16
N+3.60	B34	V30X50	173.393	0.020	VNV8	0.046	VNV16
N+3.60	B34	V30X50	213.328	0.020	VNV8	0.043	VNV16
N+3.60	B34	V30X50	253.262	0.020	VNV8	0.040	VNV16
N+3.60	B34	V30X50	293.197	0.020	VNV8	0.037	VNV16
N+3.60	B34	V30X50	333.131	0.020	VNV8	0.040	VNV16
N+3.60	B34	V30X50	373.066	0.020	VNV8	0.043	VNV16
N+3.60	B34	V30X50	413.000	0.020	VNV8	0.047	VNV16
N+3.60	B35	V30X50	0.000	0.036	VNV8	0.053	VNV16
N+3.60	B35	V30X50	17.335	0.036	VNV8	0.054	VNV16
N+3.60	B35	V30X50	34.669	0.036	VNV8	0.055	VNV16
N+3.60	B35	V30X50	52.004	0.036	VNV8	0.057	VNV16
N+3.60	B35	V30X50	69.338	0.036	VNV8	0.058	VNV16
N+3.60	B35	V30X50	86.673	0.036	VNV8	0.060	VNV16
N+3.60	B35	V30X50	104.007	0.036	VNV8	0.061	VNV16
N+3.60	B35	V30X50	121.342	0.036	VNV8	0.063	VNV16
N+3.60	B35	V30X50	138.676	0.036	VNV8	0.064	VNV16
N+3.60	B35	V30X50	156.011	0.036	VNV8	0.065	VNV16
N+3.60	B35	V30X50	173.345	0.036	VNV8	0.067	VNV16
N+3.60	B36	V30X50	13.655	0.015	VNV8	0.053	VNV16
N+3.60	B36	V30X50	70.924	0.015	VNV8	0.048	VNV16



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 53 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B36	V30X50	128.193	0.015	VNV8	0.044	VNV16
N+3.60	B36	V30X50	185.462	0.015	VNV8	0.039	VNV16
N+3.60	B36	V30X50	242.731	0.015	VNV8	0.034	VNV16
N+3.60	B36	V30X50	300.000	0.015	VNV8	0.029	VNV16
N+3.60	B36	V30X50	357.269	0.015	VNV8	0.031	VNV16
N+3.60	B36	V30X50	414.538	0.015	VNV8	0.035	VNV16
N+3.60	B36	V30X50	471.807	0.015	VNV8	0.040	VNV16
N+3.60	B36	V30X50	529.076	0.015	VNV8	0.045	VNV16
N+3.60	B36	V30X50	586.345	0.015	VNV8	0.049	VNV16
N+3.60	B37	V30X50	13.655	0.016	VNV16	0.050	VNV16
N+3.60	B37	V30X50	70.924	0.016	VNV16	0.046	VNV16
N+3.60	B37	V30X50	128.193	0.016	VNV16	0.041	VNV16
N+3.60	B37	V30X50	185.462	0.016	VNV16	0.036	VNV16
N+3.60	B37	V30X50	242.731	0.016	VNV16	0.031	VNV16
N+3.60	B37	V30X50	300.000	0.016	VNV16	0.027	VNV16
N+3.60	B37	V30X50	357.269	0.016	VNV16	0.031	VNV16
N+3.60	B37	V30X50	414.538	0.016	VNV16	0.036	VNV16
N+3.60	B37	V30X50	471.807	0.016	VNV16	0.041	VNV16
N+3.60	B37	V30X50	529.076	0.016	VNV16	0.045	VNV16
N+3.60	B37	V30X50	586.345	0.016	VNV16	0.050	VNV16
N+3.60	B38	V30X50	13.655	0.033	VNV8	0.057	VNV16
N+3.60	B38	V30X50	30.990	0.033	VNV8	0.056	VNV16
N+3.60	B38	V30X50	48.324	0.033	VNV8	0.054	VNV16
N+3.60	B38	V30X50	65.659	0.033	VNV8	0.053	VNV16
N+3.60	B38	V30X50	82.993	0.033	VNV8	0.051	VNV16
N+3.60	B38	V30X50	100.328	0.033	VNV8	0.050	VNV16
N+3.60	B38	V30X50	117.662	0.033	VNV8	0.048	VNV16
N+3.60	B38	V30X50	134.997	0.033	VNV8	0.047	VNV16
N+3.60	B38	V30X50	152.331	0.033	VNV8	0.045	VNV16
N+3.60	B38	V30X50	169.666	0.033	VNV8	0.044	VNV16
N+3.60	B38	V30X50	187.000	0.033	VNV8	0.043	VNV16
N+3.60	B39	V30X50	0.000	0.023	VNV8	0.046	VNV16
N+3.60	B39	V30X50	39.935	0.023	VNV8	0.043	VNV16
N+3.60	B39	V30X50	79.869	0.023	VNV8	0.040	VNV16
N+3.60	B39	V30X50	119.804	0.023	VNV8	0.036	VNV16
N+3.60	B39	V30X50	159.738	0.023	VNV8	0.036	VNV16
N+3.60	B39	V30X50	199.673	0.023	VNV8	0.039	VNV16
N+3.60	B39	V30X50	239.607	0.023	VNV8	0.043	VNV16
N+3.60	B39	V30X50	279.542	0.023	VNV8	0.046	VNV16
N+3.60	B39	V30X50	319.476	0.023	VNV8	0.049	VNV16
N+3.60	B39	V30X50	359.411	0.023	VNV8	0.053	VNV16
N+3.60	B39	V30X50	399.345	0.023	VNV8	0.056	VNV16
N+3.60	B40	V30X50	13.655	0.028	VNV8	0.049	VNV16
N+3.60	B40	V30X50	49.690	0.028	VNV8	0.046	VNV16
N+3.60	B40	V30X50	85.724	0.028	VNV8	0.043	VNV16
N+3.60	B40	V30X50	121.759	0.028	VNV8	0.040	VNV16
N+3.60	B40	V30X50	157.793	0.028	VNV8	0.037	VNV16
N+3.60	B40	V30X50	193.828	0.028	VNV8	0.034	VNV16
N+3.60	B40	V30X50	229.862	0.028	VNV8	0.031	VNV16
N+3.60	B40	V30X50	265.897	0.028	VNV8	0.029	VNV16
N+3.60	B40	V30X50	301.931	0.028	VNV8	0.032	VNV16
N+3.60	B40	V30X50	337.966	0.028	VNV8	0.035	VNV16
N+3.60	B40	V30X50	374.000	0.028	VNV8	0.038	VNV16
N+3.60	B41	V35X50	13.655	0.000	VNV16	0.072	VNV8
N+3.60	B41	V35X50	18.290	0.000	VNV16	0.072	VNV8
N+3.60	B41	V35X50	22.924	0.000	VNV16	0.071	VNV8
N+3.60	B41	V35X50	27.559	0.000	VNV16	0.071	VNV8
N+3.60	B41	V35X50	32.193	0.000	VNV16	0.071	VNV8
N+3.60	B41	V35X50	36.828	0.000	VNV16	0.071	VNV8
N+3.60	B41	V35X50	41.462	0.000	VNV16	0.071	VNV8
N+3.60	B41	V35X50	46.097	0.000	VNV16	0.071	VNV8
N+3.60	B41	V35X50	50.731	0.000	VNV16	0.070	VNV8
N+3.60	B41	V35X50	55.366	0.000	VNV16	0.070	VNV8
N+3.60	B41	V35X50	60.000	0.000	VNV16	0.070	VNV8




Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 54 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

N+3.60	B42	V35X50	13.655	0.000	VNV16	0.072	VNV8
N+3.60	B42	V35X50	18.290	0.000	VNV16	0.072	VNV8
N+3.60	B42	V35X50	22.924	0.000	VNV16	0.071	VNV8
N+3.60	B42	V35X50	27.559	0.000	VNV16	0.071	VNV8
N+3.60	B42	V35X50	32.193	0.000	VNV16	0.071	VNV8
N+3.60	B42	V35X50	36.828	0.000	VNV16	0.071	VNV8
N+3.60	B42	V35X50	41.462	0.000	VNV16	0.071	VNV8
N+3.60	B42	V35X50	46.097	0.000	VNV16	0.071	VNV8
N+3.60	B42	V35X50	50.731	0.000	VNV16	0.070	VNV8
N+3.60	B42	V35X50	55.366	0.000	VNV16	0.070	VNV8
N+3.60	B42	V35X50	60.000	0.000	VNV16	0.070	VNV8
N+3.60	B43	V30X50	13.655	0.000	VNV16	0.048	VNV16
N+3.60	B43	V30X50	70.924	0.000	VNV16	0.043	VNV16
N+3.60	B43	V30X50	128.193	0.000	VNV16	0.038	VNV16
N+3.60	B43	V30X50	185.462	0.000	VNV16	0.034	VNV16
N+3.60	B43	V30X50	242.731	0.000	VNV16	0.029	VNV16
N+3.60	B43	V30X50	300.000	0.000	VNV16	0.024	VNV16
N+3.60	B43	V30X50	357.269	0.000	VNV16	0.029	VNV16
N+3.60	B43	V30X50	414.538	0.000	VNV16	0.034	VNV16
N+3.60	B43	V30X50	471.807	0.000	VNV16	0.039	VNV16
N+3.60	B43	V30X50	529.076	0.000	VNV16	0.043	VNV16
N+3.60	B43	V30X50	586.345	0.000	VNV16	0.048	VNV16
N+3.60	B44	V35X50	22.500	0.055	VNV4	0.027	VNV16
N+3.60	B44	V35X50	61.250	0.055	VNV4	0.016	VNV16
N+3.60	B44	V35X50	100.000	0.055	VNV4	0.005	VNV16
N+3.60	B44	V35X50	100.000	0.013	VNV4	0.004	VNV16
N+3.60	B44	V35X50	146.250	0.013	VNV4	0.009	VNV16
N+3.60	B44	V35X50	192.500	0.013	VNV4	0.014	VNV16
N+3.60	B44	V35X50	238.750	0.013	VNV4	0.019	VNV16
N+3.60	B44	V35X50	285.000	0.013	VNV4	0.015	VNV16
N+3.60	B44	V35X50	331.250	0.013	VNV4	0.010	VNV16
N+3.60	B44	V35X50	377.500	0.013	VNV4	0.005	VNV16
N+3.60	B44	V35X50	423.750	0.013	VNV4	8.325E-05	VNV16
N+3.60	B44	V35X50	470.000	0.013	VNV4	0.005	VNV16
N+3.60	B44	V35X50	516.250	0.013	VNV4	0.010	VNV16
N+3.60	B44	V35X50	562.500	0.013	VNV4	0.015	VNV16
N+3.60	B45	V15X50	0.000	0.000	VNV16	0.018	VNV16
N+3.60	B45	V15X50	50.000	0.000	VNV16	0.016	VNV16
N+3.60	B45	V15X50	100.000	0.000	VNV16	0.015	VNV16
N+3.60	B45	V15X50	150.000	0.000	VNV16	0.014	VNV16
N+3.60	B45	V15X50	200.000	0.000	VNV16	0.013	VNV16
N+3.60	B45	V15X50	250.000	0.000	VNV16	0.011	VNV16
N+3.60	B45	V15X50	300.000	0.000	VNV16	0.010	VNV16
N+3.60	B45	V15X50	350.000	0.000	VNV16	0.010	VNV16
N+3.60	B45	V15X50	400.000	0.000	VNV16	0.011	VNV16
N+3.60	B45	V15X50	450.000	0.000	VNV16	0.012	VNV16
N+3.60	B45	V15X50	500.000	0.000	VNV16	0.013	VNV16
N+3.60	B45	V15X50	550.000	0.000	VNV16	0.015	VNV16
N+3.60	B45	V15X50	600.000	0.000	VNV16	0.016	VNV16
N+3.60	B46	V25X50	0.000	0.000	VNV16	0.003	VNV8
N+3.60	B46	V25X50	48.750	0.000	VNV16	0.000	VNV16
N+3.60	B46	V25X50	97.500	0.000	VNV16	0.000	VNV16
N+3.60	B46	V25X50	146.250	0.000	VNV16	0.000	VNV16
N+3.60	B46	V25X50	195.000	0.000	VNV16	0.000	VNV16
N+3.60	B46	V25X50	243.750	0.000	VNV16	0.000	VNV16
N+3.60	B46	V25X50	292.500	0.000	VNV16	0.000	VNV16
N+3.60	B46	V25X50	341.250	0.000	VNV16	0.000	VNV16
N+3.60	B46	V25X50	390.000	0.000	VNV16	0.000	VNV16
N+3.60	B46	V25X50	438.750	0.000	VNV16	0.000	VNV16
N+3.60	B46	V25X50	487.500	0.000	VNV16	0.000	VNV16
N+3.60	B46	V25X50	536.250	0.000	VNV16	0.000	VNV16
N+3.60	B46	V25X50	585.000	0.000	VNV16	8.864E-05	VNV8
N+3.60	B47	V25X50	0.000	0.000	VNV16	0.002	VNV8




Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 55 DE 64
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N+3.60	B47	V25X50	48.750	0.000	VNV16	0.000	VNV16
N+3.60	B47	V25X50	97.500	0.000	VNV16	0.000	VNV16
N+3.60	B47	V25X50	146.250	0.000	VNV16	0.000	VNV16
N+3.60	B47	V25X50	195.000	0.000	VNV16	0.000	VNV16
N+3.60	B47	V25X50	243.750	0.000	VNV16	0.000	VNV16
N+3.60	B47	V25X50	292.500	0.000	VNV16	0.000	VNV16
N+3.60	B47	V25X50	341.250	0.000	VNV16	0.000	VNV16
N+3.60	B47	V25X50	390.000	0.000	VNV16	0.000	VNV16
N+3.60	B47	V25X50	438.750	0.000	VNV16	0.000	VNV16
N+3.60	B47	V25X50	487.500	0.000	VNV16	0.000	VNV16
N+3.60	B47	V25X50	536.250	0.000	VNV16	0.000	VNV16
N+3.60	B47	V25X50	585.000	0.000	VNV16	0.000	VNV16

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 56 DE 64
	Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

ANEXO 6.3. DISEÑO DE COLUMNAS METALICAS

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
	Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 57 DE 64
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C O L U M N S T E E L S T R E S S C H E C K O U T P U T (AISC360-05/IBC2006)

STORY LEVEL	COLUMN LINE	SECTION ID	/-----MOMENT INTERACTION CHECK-----/				/-----SHEAR22-----/		/-----SHEAR33-----/	
			COMBO	RATIO	=	AXL + B33 + B22	COMBO	RATIO	COMBO	RATIO
N+3.60	C13	TUB273.1X9.30MM					C6	0.017	C10	0.012
		C6(C)	0.148	=	0.031	+ 0.109 + 0.044				
N+3.60	C14	TUB273.1X9.30MM					C6	0.019	C10	0.011
		C6(C)	0.157	=	0.034	+ 0.118 + 0.036				
N+3.60	C15	TUB273.1X9.30MM					C6	0.016	C10	0.012
		C6(C)	0.149	=	0.038	+ 0.106 + 0.033				
N+3.60	C16	TUB273.1X9.30MM					C6	0.016	C10	0.014
		C6(C)	0.146	=	0.035	+ 0.104 + 0.038				
N+3.60	C17	TUB273.1X9.30MM					C6	0.017	C10	0.011
		C6(C)	0.147	=	0.030	+ 0.111 + 0.037				
N+3.60	C18	TUB273.1X9.30MM					C6	0.016	C10	0.013
		C4(C)	0.141	=	0.029	+ 0.103 + 0.045				

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C O L U M N S P E C I A L S E I S M I C R E Q U I R E M E N T S (AISC360-05/IBC2006)

STORY LEVEL	COLUMN LINE	SECTION ID	SECTION CLASS	---CONTN. PLATE---	DOUBLER PLATE---	---B/C RATIOS---/		
				COMBO	AREA COMBO	THICK	MAJOR	MINOR
N+3.60	C13	TUB273.1X9.3	Compact					
N+3.60	C14	TUB273.1X9.3	Compact					
N+3.60	C15	TUB273.1X9.3	Compact					
N+3.60	C16	TUB273.1X9.3	Compact					
N+3.60	C17	TUB273.1X9.3	Compact					
N+3.60	C18	TUB273.1X9.3	Compact					



Propietario:	SEC. EDUCACION Y SEC. CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUENO	Revisó:	ING. JUAN C. PATINO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	
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ANEXO 6.4. CHEQUEO DE CONFINAMIENTO



Propietario:	SEC. EDUCACION Y SEC. CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUENO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	
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CHEQUEO DE CONFINAMIENTO
CAPACIDAD MODERADA DE DISIPACION DE ENERGIA (DMO)

SECCION cm		RECUBRIMIENTO	d (cm)
b	h	4 cm	46
35	50		

CONFINAMIENTO					
VIGAS DMO					
d/4	11.5				
8db	15.92	5	#	barra menor diametro	DMO
32dv	30.96	4	#	barra del estribo	8db
150 mm	15				
	11.50	USAR			

NO CONFINADO		
VIGAS DMO		
d/2	23	
	23	USAR

Ec (T/m2)	f'c = 28	Mpa k/m3
2675250	Wc = 2400	
2487006		



Propietario:	SEC. EDUCACION Y SEC. CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

ANEXO 6.5. CHEQUEO DE COLUMNA FUERTE-VIGA DEBIL



Propietario:	SEC. EDUCACION Y SEC. CULTUR	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

CHEQUEO CONDICION COLUMNA FUERTE - VIGA DEBIL

Chequeo de la Condición

$$\sum M_{nc} \geq 1.2 \sum M_{nb}$$

1. Calculo de los momentos resistentes de las vigas

Sentido y-y

Dimensiones de la viga:

Lado Izquierdo	
B:	35 [cm]
H:	50 [cm]
d':	5 [cm]
As-sup:	9.9 [cm2]
As-inf:	7.92 [cm2]

Lado Derecho	
B:	35 [cm]
H:	50 [cm]
d':	5 [cm]
As-sup:	9.9 [cm2]
As-inf:	7.92 [cm2]

Resistencia del concreto: 280 [kg/cm2]

Resistencia del acero: 4200 [kg/cm2]

Cuantias de acero

Ro1: #####

Ro2: #####

Ro1: #####

Ro2: #####

$$Mn = \rho f_y b d^2 \left(1 - 0.59 \rho \frac{f_y}{f'_c} \right)$$

Momentos Nominales:

Mn1: 17.67 [Ton-m]

Mn2: 14.3 [Ton-m]

Mn1: 17.67 [Ton-m]

Mn2: 14.3 [Ton-m]

Suma de momentos en sentido Horario:

Mn1-izq+Mn2-der: 32 [Ton-m]

Suma de momentos en Sentido Contrahorario:

Mn2-izq+Mn1-der: 32 [Ton-m]

Maximo: 31.97 [Ton-m]

2. Calculo de los momentos resistentes de las columnas

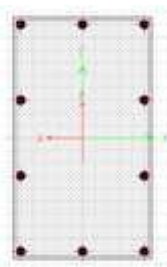
Pn	Mn
[Ton]	[T-m]
#####	0.00
#####	17.23
#####	25.83
#####	32.85
#####	38.45
#####	43.31
#####	49.60
#####	54.88
#####	46.11
17.26	36.00
#####	0.00

Dimensiones de columna:

35x60

Refuerzo de la columna:

10#7

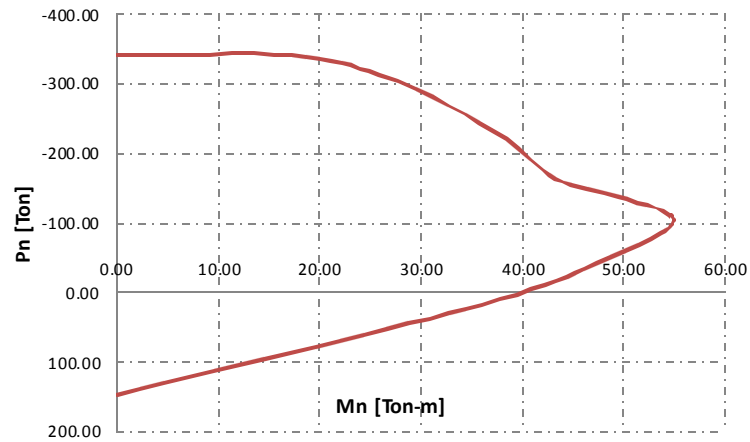


REF: SD-SECTION ETABS



Propietario:	SEC. EDUCACION Y SEC. CULTUR	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
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DIAGRAMA DE INTERACCION



Momento Nominal Superior				Momento Nominal Inferior			
Pu=	0	Ton		Pu=	-35.61	Ton	
Posición:	9			Posición:	8		
Pu0:	####	Mn-0:	46.11	Pu0:	####	Mn-0:	54.88
Pu1:	17.26	Mn-1:	36.00	Pu1:	-34.85	Mn-1:	46.11
Mn: 39.35 [Ton-m]				Mn: 46.2 [Ton-m]			

Suma de Momentos en la columna:


Mn-sup+Mn-inf: 85.6 [Ton-m]

3. Chequeo de la condición

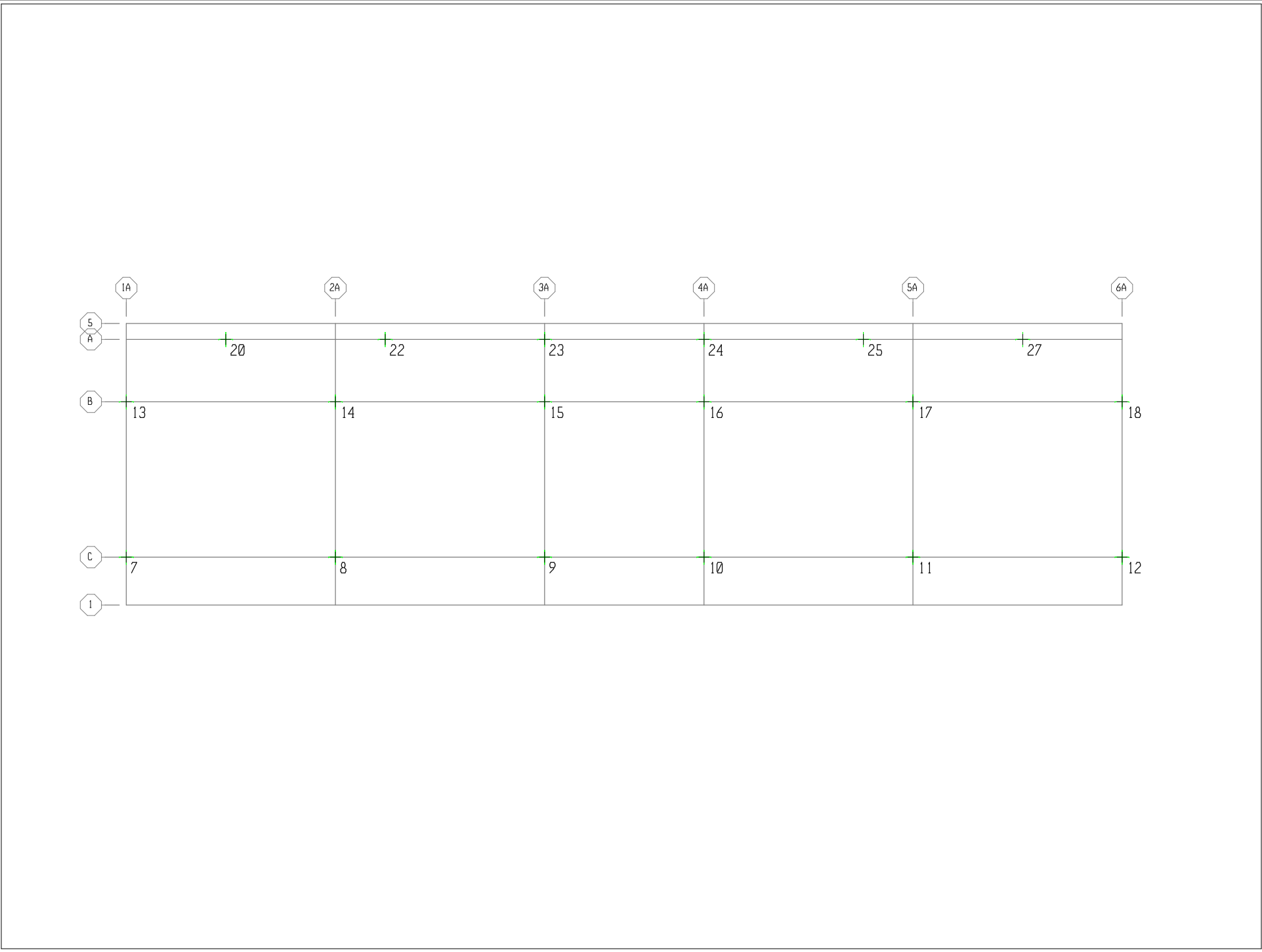
$$1.2 \sum M_{nb} = 38.37 \text{ [Ton-m]}$$


$$\sum M_{nc} = 85.6 \text{ [Ton-m]}$$

$$\sum M_{nc} \geq 1.2 \sum M_{nb} \quad \text{OK!}$$

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
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ANEXO 6. REACCIONES DE CIMENTACION



	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
	Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
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L O A D I N G C O M B I N A T I O N S

COMBO	COMBO TYPE	CASE	CASE TYPE	SCALE FACTOR
F1	ADD	DEAD	Static	1.0000
F2	ADD	DEAD	Static	1.0000
		LIVE	Static	1.0000
F3	ADD	DEAD	Static	1.0000
		SISMOX	Spectra	0.2330
		SISMOY	Spectra	0.0700
F4	ADD	DEAD	Static	1.0000
		SISMOX	Spectra	0.0700
		SISMOY	Spectra	0.2330
F5	ADD	DEAD	Static	1.0000
		SISMOX	Spectra	0.1750
		SISMOY	Spectra	0.0530
		LIVE	Static	0.7500
F6	ADD	DEAD	Static	1.0000
		SISMOX	Spectra	0.0530
		SISMOY	Spectra	0.1750
		LIVE	Static	0.7500
F7	ADD	DEAD	Static	0.6000
		SISMOX	Spectra	0.2330
		SISMOY	Spectra	0.0700
F8	ADD	DEAD	Static	0.6000
		SISMOX	Spectra	0.0700
		SISMOY	Spectra	0.2330
ENVF	ENVE	F1	Combo	1.0000
		F2	Combo	1.0000
		F3	Combo	1.0000
		F4	Combo	1.0000
		F5	Combo	1.0000
		F6	Combo	1.0000
		F7	Combo	1.0000
		F8	Combo	1.0000

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

STORY	POINT	LOAD	FX	FY	FZ	MX	MY	MZ
BASE	13	F1	2.29	0.63	14.67	-0.850	2.662	0.003
BASE	13	F2	3.44	1.00	20.37	-1.204	4.004	0.004
BASE	13	F3 Max	4.27	1.69	15.91	1.409	6.841	0.050
BASE	13	F3 Min	0.31	-0.44	13.43	-3.110	-1.516	-0.044
BASE	13	F4 Max	3.04	3.43	15.87	4.971	4.245	0.112
BASE	13	F4 Min	1.54	-2.18	13.47	-6.672	1.079	-0.106
BASE	13	F5 Max	4.64	1.72	19.88	0.592	6.807	0.039
BASE	13	F5 Min	1.67	0.10	18.01	-2.823	0.529	-0.032
BASE	13	F6 Max	3.72	3.02	19.85	3.258	4.865	0.085
BASE	13	F6 Min	2.59	-1.20	18.04	-5.489	2.472	-0.078
BASE	13	F7 Max	3.35	1.44	10.04	1.749	5.776	0.048
BASE	13	F7 Min	-0.61	-0.69	7.56	-2.770	-2.581	-0.045
BASE	13	F8 Max	2.12	3.18	10.00	5.311	3.180	0.111
BASE	13	F8 Min	0.63	-2.43	7.60	-6.332	0.014	-0.107
BASE	13	ENVF Max	4.64	3.43	20.37	5.311	6.841	0.112
BASE	13	ENVF Min	-0.61	-2.43	7.56	-6.672	-2.581	-0.107
BASE	7	F1	1.60	-0.34	15.45	0.287	1.851	0.003
BASE	7	F2	2.14	-0.55	18.92	0.615	2.471	0.004
BASE	7	F3 Max	3.68	0.78	16.48	2.619	6.212	0.050
BASE	7	F3 Min	-0.49	-1.47	14.43	-2.044	-2.509	-0.044
BASE	7	F4 Max	2.45	2.35	16.86	5.982	3.635	0.112
BASE	7	F4 Min	0.74	-3.04	14.05	-5.408	0.067	-0.106
BASE	7	F5 Max	3.57	0.35	18.82	2.294	5.592	0.039



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
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Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 60 DE 64
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BASE	7	F5 Min	0.44	-1.35	17.28	-1.228	-0.960	-0.032
BASE	7	F6 Max	2.65	1.53	19.11	4.812	3.663	0.085
BASE	7	F6 Min	1.36	-2.52	17.00	-3.745	0.968	-0.078
BASE	7	F7 Max	3.04	0.92	10.29	2.504	5.472	0.048
BASE	7	F7 Min	-1.13	-1.33	8.25	-2.159	-3.250	-0.045
BASE	7	F8 Max	1.81	2.49	10.68	5.867	2.895	0.111
BASE	7	F8 Min	0.11	-2.90	7.87	-5.522	-0.673	-0.107
BASE	7	ENVF Max	3.68	2.49	19.11	5.982	6.212	0.112
BASE	7	ENVF Min	-1.13	-3.04	7.87	-5.522	-3.250	-0.107

BASE	15	F1	-0.81	-0.55	20.84	0.484	-1.005	0.003
BASE	15	F2	-1.17	-0.88	29.13	0.946	-1.464	0.004
BASE	15	F3 Max	1.72	0.26	21.33	2.042	3.826	0.050
BASE	15	F3 Min	-3.34	-1.37	20.35	-1.074	-5.837	-0.044
BASE	15	F4 Max	0.16	1.91	21.46	5.186	0.835	0.112
BASE	15	F4 Min	-1.77	-3.01	20.22	-4.218	-2.846	-0.106
BASE	15	F5 Max	0.82	-0.18	27.42	2.009	2.280	0.039
BASE	15	F5 Min	-2.98	-1.42	26.68	-0.349	-4.979	-0.032
BASE	15	F6 Max	-0.35	1.05	27.52	4.362	0.041	0.085
BASE	15	F6 Min	-1.81	-2.65	26.59	-2.701	-2.740	-0.078
BASE	15	F7 Max	2.05	0.49	12.99	1.849	4.228	0.048
BASE	15	F7 Min	-3.02	-1.15	12.01	-1.268	-5.435	-0.045
BASE	15	F8 Max	0.48	2.13	13.12	4.992	1.237	0.111
BASE	15	F8 Min	-1.45	-2.79	11.88	-4.411	-2.444	-0.107
BASE	15	ENVF Max	2.05	2.13	29.13	5.186	4.228	0.112
BASE	15	ENVF Min	-3.34	-3.01	11.88	-4.411	-5.837	-0.107

BASE	9	F1	-0.83	0.19	19.32	-0.391	-1.024	0.003
BASE	9	F2	-1.10	0.20	24.98	-0.324	-1.358	0.004
BASE	9	F3 Max	1.73	0.83	19.80	0.950	3.898	0.050
BASE	9	F3 Min	-3.39	-0.44	18.84	-1.731	-5.945	-0.044
BASE	9	F4 Max	0.22	2.11	20.23	3.673	1.003	0.112
BASE	9	F4 Min	-1.89	-1.72	18.40	-4.455	-3.050	-0.106
BASE	9	F5 Max	0.89	0.68	23.93	0.673	2.423	0.039
BASE	9	F5 Min	-2.95	-0.28	23.20	-1.355	-4.972	-0.032
BASE	9	F6 Max	-0.23	1.64	24.25	2.712	0.256	0.085
BASE	9	F6 Min	-1.83	-1.24	22.88	-3.393	-2.805	-0.078
BASE	9	F7 Max	2.06	0.75	12.07	1.106	4.308	0.048
BASE	9	F7 Min	-3.06	-0.52	11.11	-1.575	-5.536	-0.045
BASE	9	F8 Max	0.56	2.03	12.50	3.829	1.412	0.111
BASE	9	F8 Min	-1.56	-1.80	10.68	-4.298	-2.641	-0.107
BASE	9	ENVF Max	2.06	2.11	24.98	3.829	4.308	0.112
BASE	9	ENVF Min	-3.39	-1.80	10.68	-4.455	-5.945	-0.107

BASE	16	F1	0.26	-1.21	23.73	1.233	0.253	0.003
BASE	16	F2	0.34	-1.71	31.97	1.896	0.332	0.004
BASE	16	F3 Max	2.79	-0.29	24.27	2.988	5.084	0.050
BASE	16	F3 Min	-2.27	-2.13	23.20	-0.521	-4.578	-0.044
BASE	16	F4 Max	1.21	1.46	24.55	6.343	2.085	0.112
BASE	16	F4 Min	-0.70	-3.87	22.92	-3.877	-1.579	-0.106
BASE	16	F5 Max	2.22	-0.89	30.32	3.057	3.942	0.039
BASE	16	F5 Min	-1.58	-2.28	29.51	0.403	-3.317	-0.032
BASE	16	F6 Max	1.04	0.42	30.52	5.569	1.697	0.085
BASE	16	F6 Min	-0.40	-3.59	29.30	-2.108	-1.072	-0.078
BASE	16	F7 Max	2.68	0.19	14.77	2.494	4.983	0.048
BASE	16	F7 Min	-2.38	-1.64	13.70	-1.014	-4.679	-0.045
BASE	16	F8 Max	1.11	1.94	15.05	5.850	1.984	0.111
BASE	16	F8 Min	-0.80	-3.39	13.43	-4.370	-1.681	-0.107
BASE	16	ENVF Max	2.79	1.94	31.97	6.343	5.084	0.112
BASE	16	ENVF Min	-2.38	-3.87	13.43	-4.370	-4.679	-0.107

BASE	10	F1	0.18	1.28	20.54	-1.686	0.171	0.003
BASE	10	F2	0.12	1.58	25.73	-1.959	0.081	0.004
BASE	10	F3 Max	2.73	1.96	21.01	-0.219	5.089	0.050
BASE	10	F3 Min	-2.38	0.60	20.08	-3.153	-4.747	-0.044
BASE	10	F4 Max	1.23	3.30	21.45	2.667	2.195	0.112
BASE	10	F4 Min	-0.88	-0.74	19.64	-6.039	-1.852	-0.106
BASE	10	F5 Max	2.05	2.01	24.78	-0.781	3.799	0.039
BASE	10	F5 Min	-1.79	0.99	24.08	-3.000	-3.591	-0.032



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 61 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

BASE	10	F6 Max	0.93	3.02	25.11	1.379	1.632	0.085
BASE	10	F6 Min	-0.66	-0.02	23.75	-5.160	-1.425	-0.078
BASE	10	F7 Max	2.66	1.45	12.79	0.456	5.021	0.048
BASE	10	F7 Min	-2.45	0.09	11.86	-2.479	-4.816	-0.045
BASE	10	F8 Max	1.16	2.79	13.23	3.342	2.126	0.111
BASE	10	F8 Min	-0.95	-1.25	11.42	-5.365	-1.921	-0.107
BASE	10	ENVF Max	2.73	3.30	25.73	3.342	5.089	0.112
BASE	10	ENVF Min	-2.45	-1.25	11.42	-6.039	-4.816	-0.107
BASE	18	F1	-1.30	-0.43	17.58	0.273	-1.586	0.003
BASE	18	F2	-1.97	-0.34	23.44	0.225	-2.403	0.004
BASE	18	F3 Max	0.69	0.91	18.86	3.128	2.600	0.050
BASE	18	F3 Min	-3.28	-1.77	16.29	-2.582	-5.771	-0.044
BASE	18	F4 Max	-0.53	3.12	18.93	7.718	0.019	0.112
BASE	18	F4 Min	-2.06	-3.98	16.22	-7.173	-3.191	-0.106
BASE	18	F5 Max	-0.31	0.65	22.94	2.394	0.945	0.039
BASE	18	F5 Min	-3.29	-1.37	21.01	-1.921	-5.343	-0.032
BASE	18	F6 Max	-1.22	2.31	22.99	5.830	-0.986	0.085
BASE	18	F6 Min	-2.38	-3.03	20.95	-5.357	-3.412	-0.078
BASE	18	F7 Max	1.21	1.08	11.83	3.019	3.234	0.048
BASE	18	F7 Min	-2.76	-1.60	9.26	-2.691	-5.137	-0.045
BASE	18	F8 Max	-0.01	3.29	11.90	7.609	0.654	0.111
BASE	18	F8 Min	-1.54	-3.81	9.19	-7.282	-2.557	-0.107
BASE	18	ENVF Max	1.21	3.29	23.44	7.718	3.234	0.112
BASE	18	ENVF Min	-3.29	-3.98	9.19	-7.282	-5.771	-0.107
BASE	12	F1	-0.58	1.04	17.92	-1.451	-0.726	0.003
BASE	12	F2	-0.65	1.19	21.45	-1.566	-0.823	0.004
BASE	12	F3 Max	1.52	2.41	19.02	1.444	3.647	0.050
BASE	12	F3 Min	-2.68	-0.33	16.83	-4.347	-5.099	-0.044
BASE	12	F4 Max	0.29	4.42	19.60	5.795	1.086	0.112
BASE	12	F4 Min	-1.46	-2.34	16.25	-8.697	-2.538	-0.106
BASE	12	F5 Max	0.95	2.19	21.39	0.650	2.486	0.039
BASE	12	F5 Min	-2.20	0.12	19.74	-3.725	-4.084	-0.032
BASE	12	F6 Max	0.03	3.69	21.83	3.906	0.569	0.085
BASE	12	F6 Min	-1.29	-1.39	19.31	-6.981	-2.168	-0.078
BASE	12	F7 Max	1.75	1.99	11.85	2.024	3.937	0.048
BASE	12	F7 Min	-2.44	-0.75	9.66	-3.766	-4.808	-0.045
BASE	12	F8 Max	0.53	4.00	12.43	6.375	1.376	0.111
BASE	12	F8 Min	-1.22	-2.76	9.08	-8.117	-2.248	-0.107
BASE	12	ENVF Max	1.75	4.42	21.83	6.375	3.937	0.112
BASE	12	ENVF Min	-2.68	-2.76	9.08	-8.697	-5.099	-0.107
BASE	14	F1	-0.37	1.39	17.96	-1.938	-0.506	0.005
BASE	14	F2	-0.56	1.73	26.70	-2.133	-0.765	0.006
BASE	14	F3 Max	2.64	2.98	18.07	1.683	5.501	0.080
BASE	14	F3 Min	-3.38	-0.20	17.85	-5.559	-6.513	-0.071
BASE	14	F4 Max	0.79	5.83	18.20	8.029	1.797	0.181
BASE	14	F4 Min	-1.53	-3.05	17.72	-11.904	-2.809	-0.171
BASE	14	F5 Max	1.74	2.85	24.60	0.654	3.812	0.063
BASE	14	F5 Min	-2.77	0.45	24.44	-4.821	-5.213	-0.051
BASE	14	F6 Max	0.36	4.98	24.70	5.403	1.040	0.138
BASE	14	F6 Min	-1.39	-1.69	24.34	-9.571	-2.441	-0.127
BASE	14	F7 Max	2.78	2.43	10.88	2.459	5.703	0.078
BASE	14	F7 Min	-3.23	-0.76	10.67	-4.784	-6.310	-0.073
BASE	14	F8 Max	0.93	5.28	11.01	8.804	1.999	0.179
BASE	14	F8 Min	-1.38	-3.61	10.54	-11.129	-2.607	-0.173
BASE	14	ENVF Max	2.78	5.83	26.70	8.804	5.703	0.181
BASE	14	ENVF Min	-3.38	-3.61	10.54	-11.904	-6.513	-0.173
BASE	8	F1	-0.19	-1.96	23.15	2.158	-0.268	0.003
BASE	8	F2	-0.28	-2.43	29.15	2.798	-0.387	0.004
BASE	8	F3 Max	2.37	-1.11	23.86	3.915	4.658	0.050
BASE	8	F3 Min	-2.76	-2.81	22.44	0.401	-5.194	-0.044
BASE	8	F4 Max	0.88	0.34	24.53	6.906	1.775	0.112
BASE	8	F4 Min	-1.26	-4.26	21.78	-2.590	-2.311	-0.106
BASE	8	F5 Max	1.67	-1.67	28.19	3.966	3.343	0.039
BASE	8	F5 Min	-2.18	-2.96	27.12	1.310	-4.058	-0.032
BASE	8	F6 Max	0.55	-0.59	28.69	6.205	1.186	0.085




Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 62 DE 64
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BASE	8	F6 Min	-1.06	-4.05	26.62	-0.929	-1.901	-0.078
BASE	8	F7 Max	2.45	-0.32	14.60	3.052	4.765	0.048
BASE	8	F7 Min	-2.68	-2.03	13.18	-0.462	-5.087	-0.045
BASE	8	F8 Max	0.95	1.13	15.27	6.043	1.882	0.111
BASE	8	F8 Min	-1.19	-3.48	12.52	-3.454	-2.204	-0.107
BASE	8	ENVF Max	2.45	1.13	29.15	6.906	4.765	0.112
BASE	8	ENVF Min	-2.76	-4.26	12.52	-3.454	-5.194	-0.107
BASE	17	F1	0.08	-2.79	31.83	2.725	0.031	0.005
BASE	17	F2	0.13	-3.51	42.69	3.709	0.062	0.006
BASE	17	F3 Max	3.08	-0.78	31.93	7.323	6.032	0.080
BASE	17	F3 Min	-2.92	-4.81	31.73	-1.873	-5.971	-0.071
BASE	17	F4 Max	1.23	2.74	32.04	15.188	2.324	0.181
BASE	17	F4 Min	-1.07	-8.32	31.62	-9.738	-2.263	-0.171
BASE	17	F5 Max	2.38	-1.81	40.05	6.939	4.563	0.063
BASE	17	F5 Min	-2.13	-4.86	39.90	-0.013	-4.455	-0.051
BASE	17	F6 Max	0.99	0.82	40.14	12.826	1.787	0.138
BASE	17	F6 Min	-0.75	-7.48	39.82	-5.899	-1.680	-0.127
BASE	17	F7 Max	3.05	0.34	19.20	6.233	6.020	0.078
BASE	17	F7 Min	-2.95	-3.69	19.00	-2.963	-5.983	-0.073
BASE	17	F8 Max	1.20	3.85	19.31	14.098	2.312	0.179
BASE	17	F8 Min	-1.10	-7.21	18.89	-10.828	-2.275	-0.173
BASE	17	ENVF Max	3.08	3.85	42.69	15.188	6.032	0.181
BASE	17	ENVF Min	-2.95	-8.32	18.89	-10.828	-5.983	-0.173
BASE	11	F1	0.00	1.48	34.10	-1.943	-0.035	0.003
BASE	11	F2	-0.01	1.88	41.37	-2.350	-0.074	0.004
BASE	11	F3 Max	2.57	2.53	34.91	0.257	4.889	0.050
BASE	11	F3 Min	-2.56	0.42	33.29	-4.142	-4.958	-0.044
BASE	11	F4 Max	1.07	4.30	35.75	3.939	2.000	0.112
BASE	11	F4 Min	-1.06	-1.34	32.44	-7.824	-2.069	-0.106
BASE	11	F5 Max	1.92	2.58	40.16	-0.586	3.635	0.039
BASE	11	F5 Min	-1.93	0.99	38.94	-3.911	-3.763	-0.032
BASE	11	F6 Max	0.79	3.90	40.79	2.170	1.473	0.085
BASE	11	F6 Min	-0.81	-0.34	38.31	-6.667	-1.601	-0.078
BASE	11	F7 Max	2.56	1.94	21.27	1.034	4.903	0.048
BASE	11	F7 Min	-2.56	-0.17	19.65	-3.365	-4.945	-0.045
BASE	11	F8 Max	1.06	3.71	22.11	4.716	2.014	0.111
BASE	11	F8 Min	-1.06	-1.94	18.80	-7.047	-2.055	-0.107
BASE	11	ENVF Max	2.57	4.30	41.37	4.716	4.903	0.112
BASE	11	ENVF Min	-2.56	-1.94	18.80	-7.824	-4.958	-0.107
BASE	25	F1	-0.07	0.18	7.20	-0.253	-0.102	0.001
BASE	25	F2	-0.05	0.27	11.54	-0.342	-0.090	0.001
BASE	25	F3 Max	0.92	0.34	7.69	0.115	1.694	0.015
BASE	25	F3 Min	-1.06	0.02	6.72	-0.621	-1.898	-0.013
BASE	25	F4 Max	0.51	0.63	8.51	0.771	0.863	0.033
BASE	25	F4 Min	-0.65	-0.27	5.90	-1.277	-1.067	-0.031
BASE	25	F5 Max	0.69	0.37	10.82	-0.041	1.256	0.011
BASE	25	F5 Min	-0.80	0.12	10.10	-0.598	-1.443	-0.009
BASE	25	F6 Max	0.38	0.59	11.44	0.450	0.634	0.025
BASE	25	F6 Min	-0.50	-0.09	9.48	-1.089	-0.821	-0.023
BASE	25	F7 Max	0.95	0.27	4.80	0.216	1.735	0.014
BASE	25	F7 Min	-1.03	-0.05	3.84	-0.520	-1.857	-0.013
BASE	25	F8 Max	0.54	0.56	5.63	0.872	0.904	0.033
BASE	25	F8 Min	-0.63	-0.34	3.02	-1.176	-1.026	-0.032
BASE	25	ENVF Max	0.95	0.63	11.54	0.872	1.735	0.033
BASE	25	ENVF Min	-1.06	-0.34	3.02	-1.277	-1.898	-0.032
BASE	27	F1	0.00	0.22	7.13	-0.307	-0.015	0.001
BASE	27	F2	0.02	0.35	11.27	-0.439	-0.009	0.001
BASE	27	F3 Max	0.94	0.40	7.48	0.127	1.719	0.015
BASE	27	F3 Min	-0.93	0.05	6.78	-0.740	-1.750	-0.013
BASE	27	F4 Max	0.46	0.70	7.92	0.853	0.806	0.033
BASE	27	F4 Min	-0.45	-0.26	6.34	-1.467	-0.837	-0.031
BASE	27	F5 Max	0.72	0.45	10.50	-0.078	1.293	0.011
BASE	27	F5 Min	-0.69	0.18	9.97	-0.734	-1.314	-0.009
BASE	27	F6 Max	0.35	0.68	10.83	0.466	0.610	0.025
BASE	27	F6 Min	-0.33	-0.04	9.64	-1.277	-0.631	-0.023



Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
Proyecto:	COLEGIO Y TEATRO EL ENSUEÑO	Revisó:	ING. JUAN C. PATIÑO
Localización:	BOGOTA - CUNDINAMARCA	Hoja:	PAGINA 63 DE 64
Contenido:	MODULO I - M. DE CALCULOS	Fecha:	NOVIEMBRE - 2014

BASE	27	F7 Max	0.94	0.31	4.63	0.250	1.725	0.014
BASE	27	F7 Min	-0.93	-0.04	3.93	-0.618	-1.743	-0.013
BASE	27	F8 Max	0.46	0.61	5.07	0.976	0.813	0.033
BASE	27	F8 Min	-0.45	-0.35	3.49	-1.344	-0.831	-0.032
BASE	27	ENVF Max	0.94	0.70	11.27	0.976	1.725	0.033
BASE	27	ENVF Min	-0.93	-0.35	3.49	-1.467	-1.750	-0.032
BASE	22	F1	-0.14	0.22	8.44	-0.294	-0.185	0.001
BASE	22	F2	-0.23	0.32	13.11	-0.391	-0.292	0.001
BASE	22	F3 Max	0.83	0.35	8.83	-0.002	1.586	0.015
BASE	22	F3 Min	-1.11	0.10	8.04	-0.585	-1.957	-0.013
BASE	22	F4 Max	0.37	0.59	9.47	0.540	0.690	0.033
BASE	22	F4 Min	-0.65	-0.15	7.40	-1.127	-1.061	-0.031
BASE	22	F5 Max	0.53	0.39	12.24	-0.146	1.066	0.011
BASE	22	F5 Min	-0.93	0.20	11.64	-0.587	-1.596	-0.009
BASE	22	F6 Max	0.18	0.57	12.72	0.260	0.396	0.025
BASE	22	F6 Min	-0.59	0.02	11.16	-0.993	-0.926	-0.023
BASE	22	F7 Max	0.89	0.26	5.46	0.115	1.660	0.014
BASE	22	F7 Min	-1.06	0.01	4.66	-0.468	-1.883	-0.013
BASE	22	F8 Max	0.43	0.50	6.10	0.658	0.764	0.033
BASE	22	F8 Min	-0.60	-0.23	4.03	-1.010	-0.987	-0.032
BASE	22	ENVF Max	0.89	0.59	13.11	0.658	1.660	0.033
BASE	22	ENVF Min	-1.11	-0.23	4.03	-1.127	-1.957	-0.032
BASE	20	F1	-0.06	0.28	7.71	-0.357	-0.092	0.001
BASE	20	F2	-0.10	0.42	12.00	-0.502	-0.148	0.001
BASE	20	F3 Max	0.87	0.42	7.99	-0.021	1.639	0.015
BASE	20	F3 Min	-1.00	0.14	7.43	-0.693	-1.824	-0.013
BASE	20	F4 Max	0.38	0.66	8.31	0.545	0.720	0.033
BASE	20	F4 Min	-0.51	-0.09	7.11	-1.259	-0.905	-0.031
BASE	20	F5 Max	0.61	0.49	11.14	-0.212	1.167	0.011
BASE	20	F5 Min	-0.80	0.28	10.72	-0.719	-1.436	-0.009
BASE	20	F6 Max	0.24	0.67	11.38	0.212	0.479	0.025
BASE	20	F6 Min	-0.43	0.10	10.48	-1.143	-0.748	-0.023
BASE	20	F7 Max	0.90	0.31	4.91	0.122	1.676	0.014
BASE	20	F7 Min	-0.97	0.03	4.34	-0.550	-1.787	-0.013
BASE	20	F8 Max	0.41	0.54	5.22	0.688	0.757	0.033
BASE	20	F8 Min	-0.48	-0.21	4.02	-1.116	-0.868	-0.032
BASE	20	ENVF Max	0.90	0.67	12.00	0.688	1.676	0.033
BASE	20	ENVF Min	-1.00	-0.21	4.02	-1.259	-1.824	-0.032
BASE	23	F1	-0.04	0.17	9.20	-0.229	-0.068	0.001
BASE	23	F2	-0.06	0.21	14.83	-0.266	-0.092	0.001
BASE	23	F3 Max	0.90	0.35	9.58	0.114	1.673	0.015
BASE	23	F3 Min	-0.98	-0.02	8.81	-0.573	-1.809	-0.013
BASE	23	F4 Max	0.39	0.74	10.37	0.813	0.723	0.033
BASE	23	F4 Min	-0.47	-0.41	8.02	-1.272	-0.859	-0.031
BASE	23	F5 Max	0.66	0.34	13.71	0.003	1.222	0.011
BASE	23	F5 Min	-0.76	0.06	13.13	-0.517	-1.394	-0.009
BASE	23	F6 Max	0.27	0.63	14.30	0.526	0.511	0.025
BASE	23	F6 Min	-0.38	-0.23	12.54	-1.040	-0.683	-0.023
BASE	23	F7 Max	0.92	0.29	5.90	0.206	1.700	0.014
BASE	23	F7 Min	-0.97	-0.09	5.13	-0.481	-1.782	-0.013
BASE	23	F8 Max	0.40	0.67	6.69	0.905	0.750	0.033
BASE	23	F8 Min	-0.45	-0.47	4.34	-1.180	-0.832	-0.032
BASE	23	ENVF Max	0.92	0.74	14.83	0.905	1.700	0.033
BASE	23	ENVF Min	-0.98	-0.47	4.34	-1.272	-1.809	-0.032
BASE	24	F1	0.00	0.21	8.39	-0.283	-0.023	0.001
BASE	24	F2	-0.02	0.27	13.78	-0.337	-0.048	0.001
BASE	24	F3 Max	0.93	0.42	8.81	0.105	1.711	0.015
BASE	24	F3 Min	-0.94	0.00	7.98	-0.671	-1.757	-0.013
BASE	24	F4 Max	0.41	0.83	9.65	0.856	0.745	0.033
BASE	24	F4 Min	-0.41	-0.42	7.13	-1.422	-0.791	-0.031
BASE	24	F5 Max	0.69	0.41	12.75	-0.030	1.261	0.011
BASE	24	F5 Min	-0.72	0.09	12.12	-0.617	-1.345	-0.009
BASE	24	F6 Max	0.29	0.72	13.38	0.532	0.538	0.025
BASE	24	F6 Min	-0.32	-0.22	11.48	-1.179	-0.622	-0.023
BASE	24	F7 Max	0.93	0.34	5.45	0.218	1.721	0.014

	Propietario:	SECRETARIA DE EDUCACION Y SECRETARIA DE CULTURA	Calculó:	ING. FABIO RIVERA
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BASE	24	F7 Min	-0.94	-0.09	4.62	-0.558	-1.748	-0.013
BASE	24	F8 Max	0.41	0.75	6.29	0.969	0.754	0.033
BASE	24	F8 Min	-0.41	-0.50	3.77	-1.309	-0.781	-0.032
BASE	24	ENVF Max	0.93	0.83	13.78	0.969	1.721	0.033
BASE	24	ENVF Min	-0.94	-0.50	3.77	-1.422	-1.757	-0.032

Summation	0, 0, Base	F1	0.00	0.00	305.15	1681.223	-6080.066	0.000
Summation	0, 0, Base	F2	0.00	0.00	412.45	2388.093	-8124.288	0.000
Summation	0, 0, Base	F3 MAX	35.17	14.47	315.81	1772.199	-6216.071	91.791
Summation	0, 0, Base	F3 MIN	-35.17	-14.47	294.50	1590.248	-5944.060	-91.791
Summation	0, 0, Base	F4 MAX	14.55	39.46	323.70	1874.802	-6416.153	705.871
Summation	0, 0, Base	F4 MIN	-14.55	-39.46	286.61	1487.645	-5743.978	-705.871
Summation	0, 0, Base	F5 MAX	26.42	10.94	393.66	2280.038	-7715.974	70.301
Summation	0, 0, Base	F5 MIN	-26.42	-10.94	377.59	2142.714	-7510.491	-70.301
Summation	0, 0, Base	F6 MAX	10.99	29.64	399.56	2356.833	-7865.729	529.920
Summation	0, 0, Base	F6 MIN	-10.99	-29.64	371.69	2065.918	-7360.736	-529.920
Summation	0, 0, Base	F7 MAX	35.17	14.47	193.75	1099.709	-3784.045	91.791
Summation	0, 0, Base	F7 MIN	-35.17	-14.47	172.43	917.759	-3512.034	-91.791
Summation	0, 0, Base	F8 MAX	14.55	39.46	201.64	1202.313	-3984.127	705.871
Summation	0, 0, Base	F8 MIN	-14.55	-39.46	164.55	815.156	-3311.951	-705.871
Summation	0, 0, Base	ENVF MAX	37.31	42.39	413.01	2475.501	-8066.810	637.675
Summation	0, 0, Base	ENVF MIN	-36.94	-42.38	164.51	810.865	-3354.957	-640.419



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ANEXO 8. DISEÑO DE ELEMENTOS NO ESTRUCTURALES



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DISEÑO DE ELEMENTOS NO ESTRUCTURALES (MUROS)

COLEGIO ENSUEÑO

MUROS PRIMER PISO

REF: CAPITULO A.9 NSR-10

1. Grado de Desempeño requerido: **Superior (Grupo de Uso III)**

2. Criterio de Diseño: **Elementos separados de la Estructura**

3. Fuerzas Sísmicas de Diseño:

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

a_x = Aceleración del Punto de Soporte (ref: A.9.4.2.1)

$$a_x = A_s + \frac{(S_a - A_s) h_x}{h_{eq}} \quad h_x \leq h_{eq}$$

$$a_x = S_a \frac{h_x}{h_{eq}} \quad h_x \geq h_{eq}$$

a_p = Amplificación Dinámica del Elemento No Estructural (ref: A.9.4.2.2 y Tabla A.9.5-1)

R_p = Capacidad de Disipación de Energía en el Rango Inelástico del Elemento (ref: A.9.4.9 y Tabla A.9.5-1)

Muros de Fachada:

Mampostería Reforzada Separada lateralmente de la Estructura, Apoyada solo Abajo

a_p = **2.5** Rp mínimo: **6**

Muros Divisorios:

Corredores

a_p = **1.0** Rp mínimo: **3**

Muros de Altura Total

a_p = **1.0** Rp mínimo: **1.5**

Muros de Altura Parcial

a_p = **2.5** Rp mínimo: **1.5**

Tipos de Anclaje:

Especiales:	Rp=	6.0
Dúctiles:	Rp=	3.0
No Dúctiles:	Rp=	1.5
Húmedos:	Rp=	0.5

4. Calculo de las Aceleraciones de Piso:

A_a =	0.15	Bogotá (Cundinamarca)	Coefficiente de aceleración Pico-efectiva
A_s =	0.478		Aceleración espectral, para un período de vibración igual a cero.
S_a =	0.478		Aceleración espectral. (referencia FHE)
I =	1.25		Coefficiente de Importancia
h_n =	3.5		Altura desde la base al piso mas alto de la edificación

h_{eq} : **2.63** Altura equivalente del sistema de un GDL, que simula la edificación. ($h_{eq} = 0.75 h_n$)



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NIVEL	hx	ax
BASE	0.00	0.598

5. Diseño de los elementos de reforzamiento

Mampostería de perforación Vertical

Altura del Muro: 3 m

Separación Dóvelas(máx: 150 cms) 1.5 m

Use Separación de: 0.9 m

Espesor del Muro: 0.12 m

Amplificación dinámica: 1

Aceleración del elemento : 0.598 Ver Tabla de Arriba.

Rp- Relacionado con el Anclaje: 3

Masa del Muro: 583.2 kg

$$Fp = \frac{a_x a_p}{R_p} gMp \geq \frac{a_a I}{2} gMp = 116.3 \text{ kg} \quad 54.7 \text{ kg}$$

HIPOTESIS 1. MURO EN VOLADIZO

$$Mu = Fp \cdot h/2 = 174.4 \text{ kg-m}$$

HIPOTESIS 2. MURO SIMPLEMENTE APOYADO

$$Mu = Fp \cdot h/4 = 87.2 \text{ kg-m}$$

HIPOTESIS 3. MURO EMPOTRADO EN LA BASE Y APOYADO SUPERIORMENTE

$$Mu+ = 5Fp \cdot h/32 = 54.5 \text{ kg-m}$$

$$Mu- = 3Fp \cdot h/16 = 65.4 \text{ kg-m} \quad Mmax = 65.4 \text{ kg-m}$$

Diseño de las Dovelas:

Separacion entre dovelas: 120 cm

Espesor del muro: 0.14 m

Recubrimiento a la barra: 7 cm

Nota: f'm=80 kg/cm² y Acero de 4200 kg/cm²

HIPOTESIS 1. MURO EN VOLADIZO

FLEXION

$$a = 117085.5$$

$$b = -3780.0$$

$$c = 3.0$$

$$Ro1: 0.031479$$

$$\text{use: } Ro = 0.0008 < Romax = 0.0159 \text{ OK!}$$

$$Ro2: 0.000805$$

$$Ro \text{ max: } 0.0159$$



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Acero de Refuerzo Longitudinal en cada d6vela:

As= 0.68 cm² use: 4 Ø5mm
3 Ø1/4"
1 Ø3/8"

HIPOTESIS 2. MURO SIMPLEMENTE APOYADO

FLEXION

a= 117085.5

b= -3780.0

c= 1.5

Ro1: 0.031887

use: Ro= 0.0004 < Romax= 0.0159 OK!

Ro2: 0.000397

Ro max: 0.0159

Acero de Refuerzo Longitudinal en cada d6vela:

As= 0.33 cm² use: 2 Ø5mm
2 Ø1/4"
1 Ø3/8"

HIPOTESIS 3. MURO EMPOTRADO EN LA BASE Y APOYADO SUPERIORMENTE

FLEXION

a= 117085.5

b= -3780.0

c= 1.1

Ro1: 0.031987

use: Ro= 0.0003 < Romax= 0.0159 OK!

Ro2: 0.000297

Ro max: 0.0159

Acero de Refuerzo Longitudinal en cada d6vela:

As= 0.25 cm² use: 2 Ø5mm
1 Ø1/4"
1 Ø3/8"

CORTANTE

Fuerza Cortante resistida por el muro:

ØVc= 3384.7 kg

Fuerza Cortante Total Resistida por el muro:

ØV= 3384.7 kg

HIPOTESIS 1. MURO EN VOLADIZO

Vu max= Fp= 116.3 kg ØV= 3384.7 kg OK!

HIPOTESIS 2. MURO SIMPLEMENTE APOYADO

Vu max= Fp/2= 58.1 kg ØV= 3384.7 kg OK!

HIPOTESIS 3. MURO EMPOTRADO EN LA BASE Y APOYADO SUPERIORMENTE

Vu max= 11Fp/16= 79.9 kg ØV= 3384.7 kg OK!