

MEMORIA DE CALCULO ESTRUCTURAL

Reconstrucción
Estación Ferrocarril Los Alpes – Albán, Cundinamarca

Propietario : Invias

Altura 4.1 mts Piso 1 nivel

Sistema estructural

Pórticos de Concreto

DMO

Materiales

$f'c = 211 \text{ Kg/cm}^2$ (3000PSI)

$f_y = 4200 \text{ Kg/cm}^2$ acero

Reglamentación

Decreto 926 de 2010 -- NSR 10--

Método de Diseño

Resistencia Ultima
Estados Límites

Método de Análisis sísmico

Modal

Calculista

Ing. Estructural.

Diciembre de 2015

Diciembre de 2015

Señores:

Planeación Municipal de Albán
La Ciudad

Estimados Señores

Ref.: Estación Ferrocarril Los Alpes

La presente tiene por objeto confirmar que los diseños para el proyecto de la referencia , al que corresponden estas memorias de cálculo, fueron realizadas de acuerdo con La NORMA COLOMBIANA DE DISEÑO Y CONSTRUCCIÓN SISMO RESISTENTE (NSR 10), DECRETO 926 de 2010, declaramos que Asumimos la responsabilidad por dichos dueños aquí consignados, y de acuerdo con lo anterior la revisión hecha por Planeación Municipal, NO constituye una aprobación del diseño estructural, por parte suya, o por parte de la administración Municipal, sino una verificación del cumplimiento de las normas antes mencionadas.

Cordialmente

Ing. Estructural

DESCRIPCIÓN

El proyecto corresponde a una edificación destinada a uso Institucional de un solo nivel para uso institucional

La Estructura propuesta corresponde, a una configuración de portico de concreto resistente a momento de un solo nivel con cubierta liviana

Las cargas consideradas para el diseño son las estipuladas en el capítulo B de la norma NSR-10, así: Carga, peso de muros 300 Kg/m², acabados 150 KG/m²

Las especificaciones de los materiales son: concreto $f'_c = 21$ MPA, y acero de refuerzo $f_y = 420$ MPA

La cimentación estará conformada por zapatas aisladas. La capacidad del suelo para zapatas es de 14899 kg/m².

El método de cálculo corresponde al de la resistencia última, y el análisis sísmico se desarrolló por el método modal.

El predio está ubicado en un sector con suelo tipo C de acuerdo con el estudio de suelos, y de acuerdo con la norma $A_a = 0.15$ y $A_v = 0.20$

Las secciones de las vigas se asumen de acuerdo con la tabla C.9.5. Las luces máximas en el sentido longitudinal son de 9.65 m y en el sentido transversal 7.76 m ($7.76 / 16 = 0.50$ m)

C.9.5.2.6 — La deflexión calculada de acuerdo con C.9.5.2.2 a C.9.5.2.5 no debe exceder los límites establecidos en la tabla C.9.5(b).

TABLA C.9.5(a) — Alturas o espesores mínimos de vigas no preesforzadas o losas reforzadas en una dirección a menos que se calculen las deflexiones

Elementos	Espesor mínimo, h			
	Simplemente apoyados	Con un extremo continuo	Ambos extremos continuos	En voladizo
	Elementos que NO soporten o estén ligados a divisiones u otro tipo de elementos susceptibles de dañarse debido a deflexiones grandes.			
Losas macizas en una dirección	$\frac{\ell}{20}$	$\frac{\ell}{24}$	$\frac{\ell}{28}$	$\frac{\ell}{10}$
Vigas o losas nervadas en una dirección	$\frac{\ell}{16}$	$\frac{\ell}{18.5}$	$\frac{\ell}{21}$	$\frac{\ell}{8}$

NOTAS: Los valores dados en esta tabla se deben usar directamente en elementos de concreto de peso normal y refuerzo grado 420 MPa. Para otras condiciones, los valores deben modificarse como sigue:

- (a) Para concreto liviano estructural con densidad w_c dentro del rango de 1 440 a 1 840 kg/m³, los valores de la tabla deben multiplicarse por $(1.65 - 0.0003w_c)$, pero no menos de 1.09.
 (b) Para f_c distinto de 420 MPa, los valores de esta tabla deben multiplicarse por $(0.4 + f_c/700)$.

La dimensión de las columnas se asume teniendo en cuenta la dimensión de las vigas con el fin de dar cumplimiento a lo establecido en C.21.36.2

C.21.3.6.2 — Las resistencias a flexión de las columnas deben satisfacer la ecuación (C.21-4).

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

Estacion Ferrocarril Los Alpes

ANALISIS
PESO EDIFICACIONES

COLUMNAS

	ANCHO cms	LADO cms	ALTO mts	cant	peso ton
COL 50 x 50	50	50	4.1	8	19.7

Σ Peso Columnas= 19.7

VIGAS

VIGA 25 x 50	25	50	84.38	25.31
VIGA 0 x 0	0	0	0	0.00

Σ Peso Vigas= 25.3

LOSAS

Placa cubierta	e=12	0	0.0	300.00
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Σ Peso Losas= 0.0

Area

Muros

Muros divisorios	300	207	62100
Muros concreto			0

Σ Peso Muros= 62.1

cub zinc	52	207	10.8
Acabados	150	207	31.1
	502		

Σ Total= 148.9 ton

Estacion Ferrocarril Los Alpes

ANALISIS
CORTANTE DINAMICO

Spec	Mode	Dir	F1	F2	F3	
EX		1 U1		0	0	0
EX		2 U1		0	0	0
EX		3 U1	77734.46		0	0
EX		4 U1		0	0	0
EX		5 U1		0	0	0
EX		6 U1		0	0	0
EX		7 U1	0.04		0	0
EX		8 U1		0	0	0
EX		9 U1		0	0	0
EX		10 U1		0	0	0
EX		11 U1	0.02		0	0
EX		12 U1		0	0	0
EX	All	All	77734.46		0	0
EY		1 U2		0	52143.5	0
EY		2 U2		0	1142.1	0
EY		3 U2		0	0	0
EY		4 U2		0	28.49	0
EY		5 U2		0	14339.6	0
EY		6 U2		0	10080.84	0
EY		7 U2		0	0	0
EY		8 U2		0	0	0
EY		9 U2		0	0	0
EY		10 U2		0	0	0
EY		11 U2		0	0	0
EY		12 U2		0	0	0
EY	All	All		0	64246.29	0

Construccion : Estacion Ferrocarril Los Alpes
 Localidad : Alban
 Area : 310 m² Resumen analisis de carga

Viento
Vs = 100 Kp/h Mapa B.6.5.1 Ps= λ. Kzt I P_{s10} = -0.23 KN/m² => => -40 Kg/m² Presion sobre cubierta

Sismo
Decreto 523 0.85333333 T = Ct * H^a a=0.9 Ct= 0.047 H = 4.10 mts Irregular Vs x 0.9 T= 0.1673 seg Sa= 0.563 g 0.9 x Vs R = 3.75 75385 Kgs DL= 148.91 Ton Vs= 83.76 Ton Cortante Basal deriva E = 22.34 Ton 83.76 ton

Carga viva
Carga viva placa 180 Kgf/m²

Combinaciones de carga		
Diseño Elementos		
COMB0	1.4D	
COMB1	1.2 D	+ 1.6 L
COMB2	1.2 D	+ 1.0 L
COMB3	1.2 D	+ 1.0 L
COMB4	1.2 D	+ 1.0 L
COMB5	1.2 D	+ 1.0 L
COMB6	1.2 D	+ 1.0 L
COMB7	1.2 D	+ 1.0 L
COMB8	1.2 D	+ 1.0 L
COMB9	1.2 D	+ 1.0 L
COMB10	0.9 D	
COMB11	0.9 D	
COMB12	0.9 D	
COMB13	0.9 D	
COMB14	0.9 D	
COMB15	0.9 D	
COMB16	0.9 D	
COMB17	0.9 D	

Combinaciones de carga		
CALCULO DE DERIVA		
DER	1.2D + 1.6 L	
DER	1.2 D	+ 1.0 L
DER	1.2 D	+ 1.0 L
DER	1.2 D	+ 1.0 L
DER	1.2 D	+ 1.0 L
DER	0.90 D	
DER	0.90 D	
DER	0.90 D	
DER	0.90 D	

Combinaciones de carga		
Cimentacion		
COMB1	B.2.3.1	D
COMB2	B.2.3.2	D + L
COMB3	B.2.3.6	0.9 D
COMB4		0.9 D
COMB5		0.9 D
COMB6		0.9 D
COMB7		0.9 D
COMB8		0.9 D
COMB9		0.9 D
COMB10		0.9 D

CHEQUEO DE IRREGULARIDADES -

IRREGULARIDADES EN PLANTA

TIPO DE IRREGULARIDAD		SI	NO	Øp	
Irregularidad Torsional	1aP		X	1.0	
Irregularidad Torsional Extrema	1bP		X	1.0	
Retrocesos en las Esquinas	2P		X	1.0	
Discontinuidades en el Diafragma	3P		X	1.0	
Desplazamientos del Plano de Acción	4P		X	1.0	
Sistemas no Paralelos	5P		X	1.0	

Øp (ADOPTADO) = 1.00

IRREGULARIDADES EN ALTURA

TIPO DE IRREGULARIDAD		SI	NO	Øa	
Piso Flexible	1aA		X	1.0	
Piso Flexible Extremo	1bA		X	1.0	
Irregularidad en Distorsión de Masas	2A		X	1.0	
Irregularidad Geométrica	3A		X	1.0	
Desplazamientos del Plano de Acción	4A		X	1.0	
Piso Debil	5aA		X	1.0	
Piso Debil Extremo	5bA		X	1.0	

Øa (ADOPTADO) = 1.00

Teniendo en cuenta el tipo de irregularidad se tiene:

$$R = \text{Øa} * \text{Øp} * \text{Ro}$$

donde : $\text{Øa} = 1.00$

$\text{Øp} = 1.00$

Porticos de Concreto $\text{Ør} = 0.75$

DMO

$\text{Ro} = 5.00$

entonces : **$\text{R}' = 3.75$**

Proyecto: Estacion Ferrocarril Los Alpes
Ubicación: Alban

Grupo de uso: III

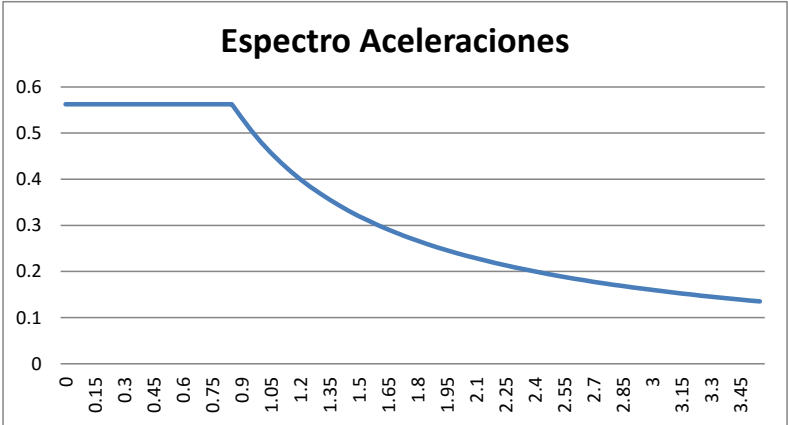
25019						
Alban	Alban	25019	0.15	0.20	Intermedia	0.16 0.06
Aa=	0.15	Fa=	1.2	Dinamico S/N		
Av=	0.20	Fv=	1.6	S		
Ad=	0.06	I=	1.25	0.4500		

Suelo tipo :	Tipo C
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T	Sa	Sr
0.1673	0.5625	0.15675

To=	0.178	Ro=	5.0
Tc=	0.85	Ωo=	3.0
TI=	3.84		
h=	4.10	Cu=	1.366
Ct=	0.047		
α=	0.9	CuTa=	0.2286 <=
Ta=	0.1673	seg	

T	Sa	Sr
0	0.5625	0.5625
0.05	0.5625	0.31718
0.1	0.5625	0.22086
0.15	0.5625	0.16941
0.2	0.5625	0.15
0.25	0.5625	0.15
0.3	0.5625	0.15
0.35	0.5625	0.15
0.4	0.5625	0.15
0.45	0.5625	0.15
0.5	0.5625	0.15
0.55	0.5625	0.15
0.6	0.5625	0.15
0.65	0.5625	0.15
0.7	0.5625	0.15
0.75	0.5625	0.15
0.8	0.5625	0.15
0.85	0.5625	0.15
0.9	0.5333	0.14222
0.95	0.5053	0.13474
1	0.48	0.128
1.05	0.4571	0.1219
1.1	0.4364	0.11636
1.15	0.4174	0.11113
1.2	0.4	0.10667
1.25	0.384	0.1024
1.3	0.3692	0.09846
1.35	0.3556	0.09481
1.4	0.3429	0.09143
1.45	0.331	0.08828
1.5	0.32	0.08533
1.55	0.3097	0.08258
1.6	0.3	0.08
1.65	0.2909	0.07758
1.7	0.2824	0.07529
1.75	0.2743	0.07314
1.8	0.2667	0.07111
1.85	0.2595	0.06919
1.9	0.2526	0.06737
1.95	0.2462	0.06564
2	0.24	0.064
2.05	0.2341	0.06244
2.1	0.2286	0.06095
2.15	0.2233	0.05953
2.2	0.2182	0.05818
2.25	0.2133	0.05689
2.3	0.2087	0.05565
2.35	0.2043	0.05447
2.4	0.2	0.05333



SISTEMA ESTRUCTURAL

Porticos de Concreto

Capacidad de disipacion de energia DMO
(TABLA A.3-3)

Ro' =

5.00

Irregularidad en planta (ϕ_p) =

1.00

(TABLA A.3-6)

Irregularidad en Altura (ϕ_a) =

1.00

(TABLA A.3-7)

Irregularidad x redund. (ϕ_r) =

0.75

(TABLA A.3-7)

Coefficiente de Capacidad de Disipación de Energía de Diseño (R') = $\phi_p \cdot \phi_a \cdot \phi_r \cdot R_o'$ (A.3.3.3)

R' = 3.75

Modificación del Coeficiente R en zonas de periodos cortos

Coefficiente de Capacidad de Disipación
de Energía de Diseño

(R) = $f_p \cdot f_a \cdot R_o$ (A.3.3.3)

$R_c = (R-1) T/T_o + 1 < R$

R= 3.75

Peso estructura = 148.91 Ton

Vs= 83.76 Ton

irregular 0.9 de la fuerza horizontal

Deriv: 0.9 x Vs= 75.38 Ton De acuerdo con el metodo de la fuerza horizontal

Diseño Vs= 20.10 Ton Factor de ajuste

Cortante Dinamico Vsx= 77.73 Ton 1.00

Vsy= 64.25 Ton 1.17

2.45	0.1959	0.05224
2.5	0.192	0.0512
2.55	0.1882	0.0502
2.6	0.1846	0.04923
2.65	0.1811	0.0483
2.7	0.1778	0.04741
2.75	0.1745	0.04655
2.8	0.1714	0.04571
2.85	0.1684	0.04491
2.9	0.1655	0.04414
2.95	0.1627	0.04339
3	0.16	0.04267
3.05	0.1574	0.04197
3.1	0.1548	0.04129
3.15	0.1524	0.04063
3.2	0.15	0.04
3.25	0.1477	0.03938
3.3	0.1455	0.03879
3.35	0.1433	0.03821
3.4	0.1412	0.03765
3.45	0.1391	0.0371
3.5	0.1371	0.03657
3.55	0.1352	0.03606

Proyecto Estacion Ferrocarril Los Alpes
Ubicación Alban

Indice de Flexibilidad
0.3281 Ok

der2 der4
0.002495 0.003281

Derivas de piso

Story	Item	Load	Point	X	Y	Z	DriftX	DriftY
STORY1	Max Drift X	DER1	1	0	8	4	0.000009	
STORY1	Max Drift Y	DER1	8	27	0	4		0.000002
STORY1	Max Drift X	DER2	2	0	0	4	0.002495	
STORY1	Max Drift Y	DER2	7	27	8	4		0.000002
STORY1	Max Drift X	DER3	2	0	0	4	0.002495	
STORY1	Max Drift Y	DER3	7	27	8	4		0.000002
STORY1	Max Drift X	DER4	1	0	8	4	0.000019	
STORY1	Max Drift Y	DER4	3	9	0	4		0.003281
STORY1	Max Drift X	DER5	3	9	0	4		0.003281
STORY1	Max Drift X	DER6	2	0	0	4	0.002493	
STORY1	Max Drift Y	DER6	7	27	8	4		0.000002
STORY1	Max Drift X	DER7	2	0	0	4	0.002493	
STORY1	Max Drift Y	DER7	7	27	8	4		0.000002
STORY1	Max Drift X	DER8	1	0	8	4	0.000017	
STORY1	Max Drift Y	DER8	3	9	0	4		0.00328
STORY1	Max Drift X	DER9	1	0	8	4	0.000017	
STORY1	Max Drift Y	DER9	3	9	0	4		0.00328

Proyecto: Estacion Ferrocarril Los Alpes
Ubicación: Alban

DESPLAZAMIENTO EN LAS ESQUINAS

Story	Point	Load	UX	UY
STORY1	1	EX	0.0102	0
STORY1	1	EY	0	0.0084
STORY1	2	EX	0.0102	0
STORY1	2	EY	0	0.0084
STORY1	7	EX	0.0102	0
STORY1	7	EY	0	0.0082
STORY1	8	EX	0.0102	0
STORY1	8	EY	0	0.0082

Estacion Ferrocarril Los Alpes
Analisis de torsion

. REVISIÓN DE LA IRREGULARIDAD TORSIONAL -

SISMO EN X

NIVEL 1

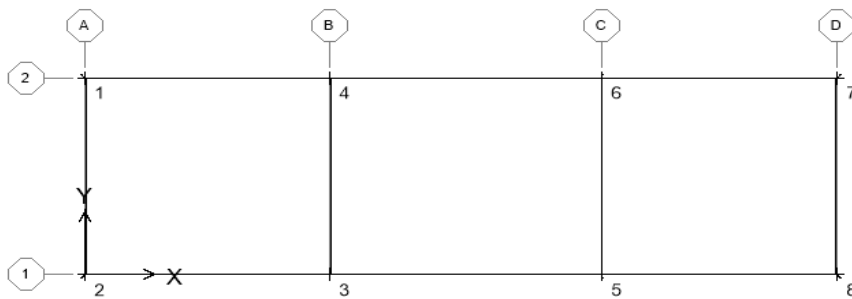
(casoEx)

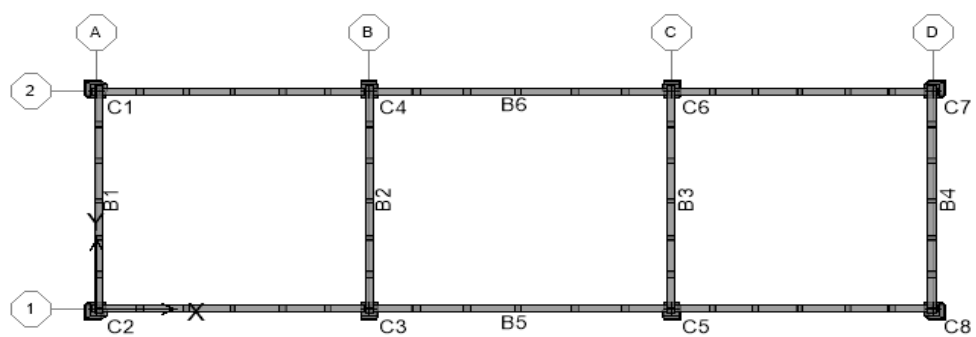
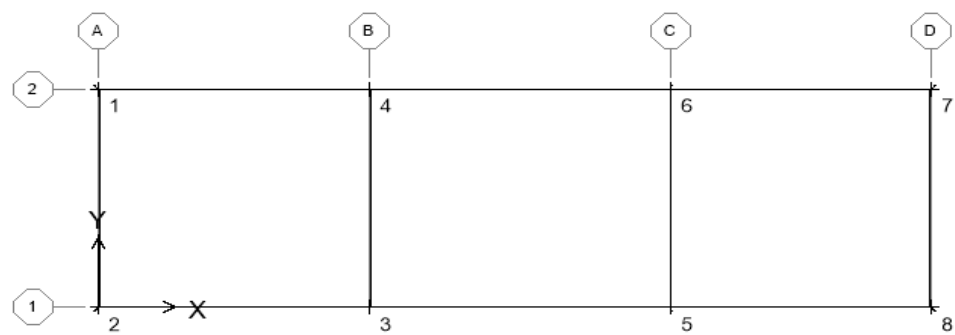
EJE DE 1	1	2			Φ_p
PISO 1	DERIVA DE ANÁLISIS $\Delta 1$ (cm)	DERIVA DE ANÁLISIS $\Delta 2$ (cm)	$1.2^* (\Delta 1 + \Delta 2)$ 2	BSERVACIÓN	
PISO	1.02	1.02	1.22	IRREGULAR	1.0

SISMO EN Y

(casoEy)

EJE DE A	1	7			Φ_p
PISO 1	DERIVA DE ANÁLISIS $\Delta 1$ (cm)	DERIVA DE ANÁLISIS $\Delta 2$ (cm)	$1.2^* (\Delta 1 + \Delta 2)$ 2	BSERVACIÓN	
PISO	0.84	0.82	1.16	REGULAR	1.0





Estacion Ferrocarril Los Alpes
Alban

DISEÑO DE VIGAS AEREAS

f'c= 21
fy= 420

MPA
MPA

3000 psi
60000 psi

Story	BayID	SecID	StnLoc	Status	AsTopCorr	AsMinTop	AsTop	AsBotCom	AsMinBot	AsBot	VCombo	VRebar	TLngCombo	TLngRe	TTTrnCombo	TTTrnReba	ErrMsg	WarnMsg
STORY1	B1	VIGA25X50	25	No Message	COMB10	3.182	3.182	COMB10	1.571	1.571	COMB10	0.02	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	73.4	No Message	COMB10	2.402	2.402	COMB18	1.471	1.471	COMB10	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	122	No Message	COMB10	1.699	1.699	COMB18	1.486	1.486	COMB10	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	170	No Message	COMB18	1.126	1.126	COMB10	1.504	1.504	COMB10	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	219	No Message	COMB10	0.78	0.78	COMB10	1.484	1.484	COMB10	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	267	No Message	COMB10	0.78	0.78	COMB10	1.398	1.398	COMB10	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	315	No Message	COMB10	0.78	0.78	COMB10	1.243	1.243	COMB10	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	364	No Message	COMB10	0.78	0.78	COMB1	1.026	1.026	COMB10	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	412	No Message	COMB10	0.78	0.78	COMB1	1.026	1.026	COMB10	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	461	No Message	COMB10	0.78	0.78	COMB10	1.243	1.243	COMB10	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	509	No Message	COMB10	0.78	0.78	COMB10	1.398	1.398	COMB10	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	557	No Message	COMB10	0.78	0.78	COMB10	1.484	1.484	COMB10	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	606	No Message	COMB18	1.126	1.126	COMB10	1.504	1.504	COMB10	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	654	No Message	COMB10	1.699	1.699	COMB18	1.486	1.486	COMB10	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	703	No Message	COMB10	2.402	2.402	COMB18	1.471	1.471	COMB10	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B1	VIGA25X50	751	No Message	COMB10	3.182	3.182	COMB10	1.571	1.571	COMB10	0.02	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	25	No Message	COMB18	3.766	3.766	COMB18	2.695	2.695	COMB10	0.023	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	73	No Message	COMB10	3.536	3.536	COMB18	2.588	2.588	COMB10	0.022	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	122	No Message	COMB10	2.647	2.647	COMB18	2.43	2.43	COMB10	0.021	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	170	No Message	COMB18	1.893	1.893	COMB10	2.275	2.275	COMB10	0.02	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	219	No Message	COMB18	1.228	1.228	COMB10	2.084	2.084	COMB10	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	267	No Message	COMB10	1.097	1.097	COMB10	1.824	1.824	COMB10	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	315	No Message	COMB10	1.097	1.097	COMB10	1.498	1.498	COMB10	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	364	No Message	COMB10	1.097	1.097	COMB10	1.107	1.107	COMB10	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	412	No Message	COMB10	1.097	1.097	COMB10	1.107	1.107	COMB10	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	461	No Message	COMB10	1.097	1.097	COMB10	1.498	1.498	COMB10	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	509	No Message	COMB10	1.097	1.097	COMB10	1.824	1.824	COMB10	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	557	No Message	COMB18	1.228	1.228	COMB10	2.084	2.084	COMB10	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	606	No Message	COMB18	1.893	1.893	COMB10	2.275	2.275	COMB10	0.02	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	654	No Message	COMB10	2.647	2.647	COMB18	2.43	2.43	COMB10	0.021	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	703	No Message	COMB10	3.536	3.536	COMB18	2.588	2.588	COMB10	0.022	COMB18	0	COMB18	0	No Message	No Message
STORY1	B2	VIGA25X50	751	No Message	COMB18	3.766	3.766	COMB18	2.695	2.695	COMB10	0.023	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	25	No Message	COMB18	3.766	3.766	COMB18	2.558	2.558	COMB10	0.023	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	73	No Message	COMB10	3.415	3.415	COMB18	2.469	2.469	COMB10	0.022	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	122	No Message	COMB10	2.546	2.546	COMB18	2.329	2.329	COMB10	0.021	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	170	No Message	COMB18	1.811	1.811	COMB10	2.193	2.193	COMB10	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	219	No Message	COMB18	1.166	1.166	COMB10	2.02	2.02	COMB10	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	267	No Message	COMB10	1.063	1.063	COMB10	1.779	1.779	COMB10	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	315	No Message	COMB10	1.063	1.063	COMB10	1.471	1.471	COMB10	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	364	No Message	COMB10	1.063	1.063	COMB10	1.098	1.098	COMB10	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	412	No Message	COMB10	1.063	1.063	COMB10	1.098	1.098	COMB10	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	461	No Message	COMB10	1.063	1.063	COMB10	1.471	1.471	COMB10	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	509	No Message	COMB10	1.063	1.063	COMB10	1.779	1.779	COMB10	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	557	No Message	COMB18	1.166	1.166	COMB10	2.02	2.02	COMB10	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	606	No Message	COMB18	1.811	1.811	COMB10	2.193	2.193	COMB10	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	654.2	No Message	COMB10	2.546	2.546	COMB18	2.329	2.329	COMB10	0.021	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	702.6	No Message	COMB10	3.415	3.415	COMB18	2.469	2.469	COMB10	0.022	COMB18	0	COMB18	0	No Message	No Message
STORY1	B3	VIGA25X50	751	No Message	COMB18	3.766	3.766	COMB18	2.558	2.558	COMB10	0.023	COMB18	0	COMB18	0	No Message	No Message

STORY1	B4	VIGA25X50	25	No Message	COMB10	3.11	3.11	COMB10	1.536	1.536	COMB10	0.02	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	73	No Message	COMB10	2.341	2.341	COMB18	1.411	1.411	COMB10	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	122	No Message	COMB10	1.648	1.648	COMB18	1.435	1.435	COMB10	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	170	No Message	COMB18	1.084	1.084	COMB10	1.462	1.462	COMB10	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	219	No Message	COMB10	0.763	0.763	COMB10	1.452	1.452	COMB10	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	267	No Message	COMB10	0.763	0.763	COMB10	1.374	1.374	COMB10	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	315	No Message	COMB10	0.763	0.763	COMB10	1.23	1.23	COMB10	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	364	No Message	COMB10	0.763	0.763	COMB1	1.026	1.026	COMB10	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	412	No Message	COMB10	0.763	0.763	COMB1	1.026	1.026	COMB10	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	461	No Message	COMB10	0.763	0.763	COMB10	1.23	1.23	COMB10	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	509	No Message	COMB10	0.763	0.763	COMB10	1.374	1.374	COMB10	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	557	No Message	COMB10	0.763	0.763	COMB10	1.452	1.452	COMB10	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	606	No Message	COMB18	1.084	1.084	COMB10	1.462	1.462	COMB10	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	654	No Message	COMB10	1.648	1.648	COMB18	1.435	1.435	COMB10	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	703	No Message	COMB10	2.341	2.341	COMB18	1.411	1.411	COMB10	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B4	VIGA25X50	751	No Message	COMB10	3.11	3.11	COMB10	1.536	1.536	COMB10	0.02	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	25	No Message	COMB6	3.091	3.091	COMB6	1.526	1.526	COMB18	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	75	No Message	COMB6	2.335	2.335	COMB14	1.211	1.211	COMB18	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	124	No Message	COMB6	1.659	1.659	COMB14	1.321	1.321	COMB18	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	174	No Message	COMB14	1.105	1.105	COMB6	1.423	1.423	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	223	No Message	COMB6	0.759	0.759	COMB6	1.503	1.503	COMB18	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	273	No Message	COMB6	0.759	0.759	COMB6	1.512	1.512	COMB18	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	323	No Message	COMB6	0.759	0.759	COMB6	1.451	1.451	COMB18	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	372	No Message	COMB6	0.759	0.759	COMB6	1.318	1.318	COMB18	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	422	No Message	COMB6	0.759	0.759	COMB1	1.141	1.141	COMB18	0.01	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	471	No Message	COMB6	0.759	0.759	COMB1	1.082	1.082	COMB18	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	521	No Message	COMB6	0.759	0.759	COMB6	1.112	1.112	COMB18	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	570.471	No Message	COMB6	0.759	0.759	COMB6	1.143	1.143	COMB18	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	620.059	No Message	COMB6	0.759	0.759	COMB6	1.103	1.103	COMB18	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	670	No Message	COMB14	0.946	0.946	COMB6	0.993	0.993	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	719	No Message	COMB6	1.566	1.566	COMB14	0.905	0.905	COMB18	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	769	No Message	COMB6	2.272	2.272	COMB14	0.772	0.772	COMB18	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	818	No Message	COMB6	3.059	3.059	COMB6	0.759	0.759	COMB18	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	868	No Message	COMB6	3.766	3.766	COMB6	0.759	0.759	COMB18	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	868	No Message	COMB6	3.766	3.766	COMB6	0.759	0.759	COMB18	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	916	No Message	COMB6	2.969	2.969	COMB6	0.759	0.759	COMB18	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	965	No Message	COMB6	2.229	2.229	COMB6	0.759	0.759	COMB18	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,013	No Message	COMB6	1.565	1.565	COMB6	0.759	0.759	COMB18	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,061	No Message	COMB6	0.975	0.975	COMB14	0.862	0.862	COMB18	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,109	No Message	COMB6	0.759	0.759	COMB6	1.061	1.061	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,158	No Message	COMB6	0.759	0.759	COMB6	1.211	1.211	COMB18	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,206	No Message	COMB6	0.759	0.759	COMB6	1.293	1.293	COMB18	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,254	No Message	COMB6	0.759	0.759	COMB6	1.309	1.309	COMB18	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,302	No Message	COMB6	0.759	0.759	COMB1	1.287	1.287	COMB18	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,351	No Message	COMB6	0.759	0.759	COMB1	1.327	1.327	COMB18	0.01	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,399	No Message	COMB6	0.759	0.759	COMB1	1.29	1.29	COMB18	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,447	No Message	COMB6	0.759	0.759	COMB6	1.308	1.308	COMB18	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1495.25	No Message	COMB6	0.759	0.759	COMB6	1.295	1.295	COMB18	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1543.5	No Message	COMB6	0.759	0.759	COMB6	1.215	1.215	COMB18	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1591.75	No Message	COMB6	0.759	0.759	COMB6	1.068	1.068	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,640	No Message	COMB6	0.954	0.954	COMB14	0.867	0.867	COMB18	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,688	No Message	COMB6	1.542	1.542	COMB6	0.759	0.759	COMB18	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,737	No Message	COMB6	2.203	2.203	COMB6	0.759	0.759	COMB18	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,785	No Message	COMB6	2.94	2.94	COMB6	0.759	0.759	COMB18	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,833	No Message	COMB6	3.756	3.756	COMB6	0.759	0.759	COMB18	0.019	COMB18	0	COMB18	0	No Message	No Message

STORY1	B5	VIGA25X50	1,833	No Message	COMB6	3.766	3.766	COMB6	0.759	0.759	COMB18	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,881	No Message	COMB6	3.021	3.021	COMB6	0.759	0.759	COMB18	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,928	No Message	COMB6	2.269	2.269	COMB14	0.846	0.846	COMB18	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	1,976	No Message	COMB6	1.591	1.591	COMB14	0.947	0.947	COMB18	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2,023	No Message	COMB14	0.989	0.989	COMB6	1.002	1.002	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2,071	No Message	COMB6	0.759	0.759	COMB6	1.083	1.083	COMB18	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2,119	No Message	COMB6	0.759	0.759	COMB6	1.099	1.099	COMB18	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2,166	No Message	COMB6	0.759	0.759	COMB6	1.05	1.05	COMB18	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2,214	No Message	COMB6	0.759	0.759	COMB1	0.989	0.989	COMB18	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2,261	No Message	COMB6	0.759	0.759	COMB1	1.047	1.047	COMB18	0.01	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2,309	No Message	COMB6	0.759	0.759	COMB6	1.249	1.249	COMB18	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2,356	No Message	COMB6	0.759	0.759	COMB6	1.397	1.397	COMB18	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2,404	No Message	COMB6	0.759	0.759	COMB6	1.481	1.481	COMB18	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2,452	No Message	COMB6	0.759	0.759	COMB6	1.499	1.499	COMB18	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2,499	No Message	COMB14	1.139	1.139	COMB6	1.452	1.452	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2546.82	No Message	COMB6	1.667	1.667	COMB14	1.381	1.381	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2594.41	No Message	COMB6	2.31	2.31	COMB14	1.305	1.305	COMB18	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B5	VIGA25X50	2,642	No Message	COMB6	3.028	3.028	COMB6	1.495	1.495	COMB18	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	25	No Message	COMB6	3.091	3.091	COMB6	1.526	1.526	COMB18	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	75	No Message	COMB6	2.335	2.335	COMB14	1.211	1.211	COMB18	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	124	No Message	COMB6	1.659	1.659	COMB14	1.321	1.321	COMB18	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	174	No Message	COMB14	1.105	1.105	COMB6	1.423	1.423	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	223	No Message	COMB6	0.759	0.759	COMB6	1.503	1.503	COMB18	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	273	No Message	COMB6	0.759	0.759	COMB6	1.512	1.512	COMB18	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	323	No Message	COMB6	0.759	0.759	COMB6	1.451	1.451	COMB18	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	372	No Message	COMB6	0.759	0.759	COMB6	1.318	1.318	COMB18	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	422	No Message	COMB6	0.759	0.759	COMB1	1.141	1.141	COMB18	0.01	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	471	No Message	COMB6	0.759	0.759	COMB1	1.082	1.082	COMB18	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	521	No Message	COMB6	0.759	0.759	COMB6	1.112	1.112	COMB18	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	570	No Message	COMB6	0.759	0.759	COMB6	1.143	1.143	COMB18	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	620	No Message	COMB6	0.759	0.759	COMB6	1.103	1.103	COMB18	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	670	No Message	COMB14	0.946	0.946	COMB6	0.993	0.993	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	719	No Message	COMB6	1.566	1.566	COMB14	0.905	0.905	COMB18	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	769	No Message	COMB6	2.272	2.272	COMB14	0.772	0.772	COMB18	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	818	No Message	COMB6	3.059	3.059	COMB6	0.759	0.759	COMB18	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	868	No Message	COMB6	3.766	3.766	COMB6	0.759	0.759	COMB18	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	868	No Message	COMB6	3.766	3.766	COMB6	0.759	0.759	COMB18	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	916	No Message	COMB6	2.969	2.969	COMB6	0.759	0.759	COMB18	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	965	No Message	COMB6	2.229	2.229	COMB6	0.759	0.759	COMB18	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,013	No Message	COMB6	1.565	1.565	COMB6	0.759	0.759	COMB18	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,061	No Message	COMB6	0.975	0.975	COMB14	0.862	0.862	COMB18	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,109	No Message	COMB6	0.759	0.759	COMB6	1.061	1.061	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,158	No Message	COMB6	0.759	0.759	COMB6	1.211	1.211	COMB18	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,206	No Message	COMB6	0.759	0.759	COMB6	1.293	1.293	COMB18	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,254	No Message	COMB6	0.759	0.759	COMB6	1.309	1.309	COMB18	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,302	No Message	COMB6	0.759	0.759	COMB1	1.287	1.287	COMB18	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,351	No Message	COMB6	0.759	0.759	COMB1	1.327	1.327	COMB18	0.01	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,399	No Message	COMB6	0.759	0.759	COMB1	1.29	1.29	COMB18	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,447	No Message	COMB6	0.759	0.759	COMB6	1.308	1.308	COMB18	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,495	No Message	COMB6	0.759	0.759	COMB6	1.295	1.295	COMB18	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1543.5	No Message	COMB6	0.759	0.759	COMB6	1.215	1.215	COMB18	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1591.75	No Message	COMB6	0.759	0.759	COMB6	1.068	1.068	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1640	No Message	COMB6	0.954	0.954	COMB14	0.867	0.867	COMB18	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,688	No Message	COMB6	1.542	1.542	COMB6	0.759	0.759	COMB18	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1736.5	No Message	COMB6	2.203	2.203	COMB6	0.759	0.759	COMB18	0.018	COMB18	0	COMB18	0	No Message	No Message

STORY1	B6	VIGA25X50	1784.75	No Message	COMB6	2.94	2.94	COMB6	0.759	0.759	COMB18	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1833	No Message	COMB6	3.756	3.756	COMB6	0.759	0.759	COMB18	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1,833	No Message	COMB6	3.766	3.766	COMB6	0.759	0.759	COMB18	0.019	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1880.59	No Message	COMB6	3.021	3.021	COMB6	0.759	0.759	COMB18	0.018	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1928.18	No Message	COMB6	2.269	2.269	COMB14	0.846	0.846	COMB18	0.017	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	1975.77	No Message	COMB6	1.591	1.591	COMB14	0.947	0.947	COMB18	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,023	No Message	COMB14	0.989	0.989	COMB6	1.002	1.002	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,071	No Message	COMB6	0.759	0.759	COMB6	1.083	1.083	COMB18	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,119	No Message	COMB6	0.759	0.759	COMB6	1.099	1.099	COMB18	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,166	No Message	COMB6	0.759	0.759	COMB6	1.05	1.05	COMB18	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,214	No Message	COMB6	0.759	0.759	COMB1	0.989	0.989	COMB18	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,261	No Message	COMB6	0.759	0.759	COMB1	1.047	1.047	COMB18	0.01	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,309	No Message	COMB6	0.759	0.759	COMB6	1.249	1.249	COMB18	0.011	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,356	No Message	COMB6	0.759	0.759	COMB6	1.397	1.397	COMB18	0.012	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,404	No Message	COMB6	0.759	0.759	COMB6	1.481	1.481	COMB18	0.013	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,452	No Message	COMB6	0.759	0.759	COMB6	1.499	1.499	COMB18	0.014	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,499	No Message	COMB14	1.139	1.139	COMB6	1.452	1.452	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,547	No Message	COMB6	1.667	1.667	COMB14	1.381	1.381	COMB18	0.015	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,594	No Message	COMB6	2.31	2.31	COMB14	1.305	1.305	COMB18	0.016	COMB18	0	COMB18	0	No Message	No Message
STORY1	B6	VIGA25X50	2,642	No Message	COMB6	3.028	3.028	COMB6	1.495	1.495	COMB18	0.017	COMB18	0	COMB18	0	No Message	No Message

Proyecto Estacion Ferrocarril Los Alpes
Ubicación Alban

DISEÑO DE COLUMNAS

f'c= 21 MPA
fy= 420 MPA

Story	ColLine	SecID	StnLoc	DesignOpt	PMMCombo	AsMin	As
STORY1	C1	COLUMNAS50X50	0	Check	COMB10	25.	26.839
STORY1	C1	COLUMNAS50X50	180	Check	COMB6	25.	26.839
STORY1	C1	COLUMNAS50X50	360	Check	COMB10	25.	26.839
STORY1	C2	COLUMNAS50X50	0	Check	COMB10	25.	26.839
STORY1	C2	COLUMNAS50X50	180	Check	COMB6	25.	26.839
STORY1	C2	COLUMNAS50X50	360	Check	COMB10	25.	26.839
STORY1	C3	COLUMNAS50X50	0	Check	COMB18	25.	26.839
STORY1	C3	COLUMNAS50X50	180	Check	COMB10	25.	26.839
STORY1	C3	COLUMNAS50X50	360	Check	COMB10	25.	26.839
STORY1	C4	COLUMNAS50X50	0	Check	COMB18	25.	26.839
STORY1	C4	COLUMNAS50X50	180	Check	COMB10	25.	26.839
STORY1	C4	COLUMNAS50X50	360	Check	COMB10	25.	26.839
STORY1	C5	COLUMNAS50X50	0	Check	COMB10	25.	26.839
STORY1	C5	COLUMNAS50X50	180	Check	COMB10	25.	26.839
STORY1	C5	COLUMNAS50X50	360	Check	COMB10	25.	26.839
STORY1	C6	COLUMNAS50X50	0	Check	COMB10	25.	26.839
STORY1	C6	COLUMNAS50X50	180	Check	COMB10	25.	26.839
STORY1	C6	COLUMNAS50X50	360	Check	COMB10	25.	26.839
STORY1	C7	COLUMNAS50X50	0	Check	COMB6	25.	26.839
STORY1	C7	COLUMNAS50X50	180	Check	COMB6	25.	26.839
STORY1	C7	COLUMNAS50X50	360	Check	COMB10	25.	26.839
STORY1	C8	COLUMNAS50X50	0	Check	COMB6	25.	26.839
STORY1	C8	COLUMNAS50X50	180	Check	COMB6	25.	26.839
STORY1	C8	COLUMNAS50X50	360	Check	COMB10	25.	26.839

Estacion Ferrocarril Los Alpes

Alban

Reacciones con envolvente de CIMENTACION

		Story	Point	Load	FX	FY	FZ
A'7	C1	BASE	1	/CIM N	528.39	-475.13	14152.12
A7	C2	BASE	2	/CIM N	528.39	475.13	14,152
C9'	C3	BASE	3	/CIM N	68.33	475.13	26074.54
A5	C4	BASE	4	/CIM N	68.33	-475.13	26074.54
B5	C5	BASE	5	/CIM N	-110.31	475.13	25,656
B'5	C6	BASE	6	/CIM N	-110.31	-475.13	25656.03
A4	C7	BASE	7	/CIM N	-484.81	-475.13	13735.05
B4	C8	BASE	8	/CIM N	-484.81	475.13	13735.05

Proyecto Estacion Ferrocarril Los Alpes
Localizacion Alban
Analisis de cimentación

Estudio de suelos
qa= 21100 Kg/m²

Analisis de cimentación
Kg/m² fy= 4211 Kg/m²
4.211 Ton/cm²

Utilizamos la envolvente de diseño Max 18707.32
Contenid Analisis de cimentación 0.211 Ton/cm²

			DIMENSIONES				0.211 Ton/cm²																	
Joint		U3	Columna		Cimiento		d												# barras					
Text		Kgf	x	y	x	y	Calc	asum	σ neta	M	Mu	K	ρ	Ast	Nº 4	1 cada	Ast	Nº 4	1 cada					
			cm	cm	cm	cm	cms	cms	kg/m²	kg x m²	t-m	t/cm		cm²										
1	C1	14152.12	50	50	100	100	8.31	18.0	14752	461.0	0.46	0.00142	0.00180	4.50	4	28.7	4.5	4	28.7					
2	C2	14,152	50	50	100	100	8.31	18.0	14752	461.0	0.46	0.00142	0.00180	4.50	4	28.7	4.5	4	28.7					
9	C3	26074.54	50	50	120	120	13.10	18.0	18707	1375.0	1.37	0.00354	0.00180	5.40	5	26.5	5.4	5	26.5					
11	C4	26074.54	50	50	120	120	13.10	18.0	18707	1375.0	1.37	0.00354	0.00180	5.40	5	26.5	5.4	5	26.5					
12	C5	25,656	50	50	120	120	13.00	18.0	18417	1353.6	1.35	0.00348	0.00180	5.40	5	26.5	5.4	5	26.5					
13	C6	25656.03	50	50	120	120	13.00	18.0	18417	1353.6	1.35	0.00348	0.00180	5.40	5	26.5	5.4	5	26.5					
17	C7	13735.05	50	50	100	100	8.19	18.0	14335	448.0	0.45	0.00138	0.00180	4.50	4	28.7	4.5	4	28.7					
20	C8	13735.05	50	50	100	100	8.19	18.0	14335	448.0	0.45	0.00138	0.00180	4.50	4	28.7	4.5	4	28.7					

														cortante								
Vu(d/2)		Vu(d/2)		Vu(d/2)		Vu(d)																
Ton		Kg/cm²		Ton		Kg/cm²				Vu		σf(d)		V(d/2)		Vu		ωf(d/2)				
										t		t		kg/cm²		t		t		kg/cm²		
C1	6.74	16.85	rev		1.76	0.70	Ok <6.54	7	1.004	1.707	0.95	1.93	3.28	2.68	ok							
C2	6.74	16.85	rev		1.76	0.70	Ok <6.54	7	1.006	1.710	0.95	1.93	3.28	2.68	ok							
C3	15.55	23.92	rev		6.49	2.16	Ok <6.54	17	3.707	6.302	2.92	4.44	7.55	6.17	ok							
C4	15.55	23.92	rev		6.49	2.16	Ok <6.54	17	3.711	6.309	2.92	4.45	7.56	6.18	ok							
C5	15.30	23.54	rev		6.39	2.13	Ok <6.54	17	3.657	6.217	2.88	4.38	7.45	6.09	ok							
C6	15.30	23.54	rev		6.39	2.13	Ok <6.54	17	3.660	6.222	2.88	4.38	7.45	6.09	ok							
C7	6.55	16.38	rev		1.71	0.68	Ok <6.54	7	0.972	1.652	0.92	1.87	3.17	2.59	ok							
C8	6.55	16.38	rev		1.71	0.68	Ok <6.54	7	0.963	1.636	0.91	1.85	3.14	2.57	ok							

Proyecto : Estacion Ferrocarril Los Alpes
 Localidad: Alban
 Contiene : Analisis elementos no estructurales

$$a_x = 0.410$$

MUROS

$$a_x = \frac{C_v x V_s}{m_x g} = 1.480$$

$$F_p = \frac{a_x}{R_p} a_p M_p g$$

Muro de mampostería reforzada de altura total

$$\begin{aligned} a_x &= 1.48 \\ a_p &= 1.00 \text{ (Tabla A-9-2)} \\ R_p &= 1.50 \end{aligned}$$

Peso del muro

$F_y =$	4211 Kg/cm ²	$f'_m =$	1750 Kg/cm ²	
$A_s =$	0.71 cm ²	$b =$	12 cm	
$h =$	4 m	$P =$	2.32 Ton	
$\gamma =$	1.8 ton/m ²	$W_u =$	0.16 Ton/m	
$e =$	0.15 m	$M_u =$	11.8 Ton-cm	
$L =$	3.50 m	$\phi M_n =$	14.3 Ton-cm	Ok
Dovelas	6 --1/c 0.7m			

$$= 17.8 \text{ Ton-cm}$$

$$\begin{aligned} V_u &= 0.19 \text{ ton} \\ &= 2.13 \text{ ton} \\ \phi V_n &= 1.28 \text{ ton} \end{aligned}$$

Muro de mamposteria reforzada de altura parcial

a _x =	1.48
a _p =	2.50 (Tabla A-9-2)
R _p =	1.50

Peso del muro

F _y =	4211 Kg/cm ²	f' _m =	1750 Kg/cm ²	
A _s =	0.71 cm ²	b =	12 cm	
h=	1.2 m	P =	1.13 Ton	
γ=	1.8 ton/m ²	W _u =	0.16 Ton/m	
e=	0.15 m	M _u =	11.3 Ton-cm	
L=	3.50 m	øM _n =	14.3 Ton-cm	Ok
Dovelas	6 --1/c 0.7m			

$$M_n = A_s F_y \left[d - 0.59 \frac{A_s}{2b} \frac{F_y}{f_m} \right] = 17.8 \text{ Ton-cm}$$

$$V_n = 0.53 \sqrt{f'_m} b h$$

V _u =	0.09 ton
=	2.13 ton
øV _n =	1.28 ton

Dinteles hasta 2.7 m

a _p	1.00	w _u =	0.336 ton/m	
R _p	1.50	M _u =	30.22 ton-cm	
L=	2.7 m	øM _n =	32.2056 ton-cm	ok
b	15	V _u =	453.6 K	
h	15	V _n =	1249 Kg	ok