



AUTOPISTAS DEL SOL S.A

**ESTUDIOS DEFINITIVOS DE LA SEGUNDA CALZADA Y DISEÑO DE LA REHABILITACIÓN
DEL CORREDOR EXISTENTE DEL TRAMO GAMBOTE-VARIANTE MAMONAL Y DE LA
VARIANTE CARTAGENA.**

**INFORME FINAL
MEMORIAS DE CÁLCULO ESTRUCTURAL PARA EL PUENTE
EN CONCRETO REFORZADO ABOCOL
ENTRE EL K0+054.335 Y K0+075.735**

VERSIÓN 2.0



TC-2068-134



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CONTROL DE MODIFICACIONES

Versión Nº	Fecha	Numeral Modificado	Descripción de la Modificación	Responsable
2.0	Mayo de 2013	N/A	Emisión Original	Ing. José del Carmen Nieto

Elaboró: Ing. Luis Fernando Santander	Revisó: Ing. Ivonne Avendaño	Aprobó:	Fecha: Mayo de 2013
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TABLA DE CONTENIDO

1. INTRODUCCIÓN	4
2. PARÁMETROS DE DISEÑO	4
3. COMBINACIONES DE CARGA	5
4. DESCRIPCIÓN DE LA ESTRUCTURA	6
5. DISEÑO SUPERESTRUCTURA	8
5.1. Viga	8
5.2. Tablero	24
5.3. Placa de acceso	27
6. DISEÑO ESTRIBO	28
6.1. Espaldar	28
6.2. Vástago	31
6.3. Conectores sísmicos	35
6.4. Tope sísmico	36
6.5. Zapata	37
6.6. Pilotes estribo	41
7. DISEÑO MURO DE CONTENCIÓN	52
7.1. Pantalla	53
7.2. Contrafuerte	56
7.3. Dado	58
7.4. Pilotes muros	60

1. INTRODUCCIÓN

Como parte de las acciones a realizar sobre la variante Mamomal-Gambote se encuentra la construcción de diferentes puentes entre los cuales está el puente vehicular Abocol, localizado en el kilómetro K26+300.

En una primera etapa otorgó el Contrato de Concesión vial a LA SOCIEDAD AUTOPISTAS DEL SOL., el Contrato de Concesión Ruta del Sol, el cual hace parte del Programa para el Desarrollo de Concesiones de Autopistas 2006 – 2014.

El siguiente informe corresponde a las memorias de cálculo que sirvieron como base para el desarrollo del diseño estructural del puente intersección Abocol, el cual fue asignado a S&A – Santander y Asociados Ltda.

2. PARÁMETROS DE DISEÑO

Carga viva de diseño:

Camión C40-95 y/o su línea de carga equivalente.

Sísmicos:

Los parámetros para los análisis y diseños sísmicos se tomaron del CCDSP-95 y de la Norma NSR10 en lo que le fue pertinente. El coeficiente de aceleración sísmica A_a se tomó de 0.25.

Normas utilizadas:

Código Colombiano de Diseño Sísmico de Puentes. 1995
Normas AASHTO 2007
Norma NSR10

Materiales:

.-Concreto de 210 k/cm^2 para pilotes.

.-Concreto de 280 k/cm^2 para estribos, riostras, tablero, placas de acceso, andenes y bordillos.

.-Concreto de 350 k/cm^2 para vigas presforzadas.

.-Refuerzo $f_y=4200 \text{ k/cm}^2$ para todos los diámetros.

.-Refuerzo tensionado Grado 270 ($f_{pu}=18900 \text{ k/cm}^2$) de baja relajación.

3. COMBINACIONES DE CARGA

TABLA 1, CASOS Y COMBINACIONES DE CARGA

CASOS DE CARGA	COMBINACIONES DE CARGA					
	GRU1	GRU7L	GRU7T	GR1	GR7L	GR7T
DEAD	1.3	1	1	1	1	1
BARAN Y BORD	1.3	1	1	1	1	1
LINEA DE CARGA	2.2	-	-	1	-	-
RELLENO	1.3	1	1	1	1	1
EMPUJE	1.7	1	1	1	1	1
SOBRECARGA	1.7	-	-	1	-	-
MONONOBE OKABE	-	1	1	-	0.71	0.71
FUERZAS INERCIALES**	-	1	1	-	0.71	0.71

**Para las fuerzas inerciales se tomo $A_a=0.25$

COMBINACIONES DE CARGA SEGÚN MODELO DE ANALISIS PARA ESTRIBOS

Load Combination Data

Load Combination Name (User-Generated): COMB2

Notes: [Modify/Show Notes...](#)

Load Combination Type: Linear Add

Options:

[Convert to User Load Combo](#) [Create Nonlinear Load Case from Load Combo](#)

Define Combination of Load Case Results:

Load Case Name	Load Case Type	Scale Factor
DEAD	Linear Static	1.
DEAD	Linear Static	1.
Pcm	Linear Static	1.
Wcm	Linear Static	1.
Empuje	Linear Static	1.
Sismo	Linear Static	0.71

[Add](#) [Modify](#) [Delete](#)

[OK](#) [Cancel](#)

Load Combination Data

Load Combination Name (User-Generated): COMB1

Notes: [Modify/Show Notes...](#)

Load Combination Type: Linear Add

Options:

[Convert to User Load Combo](#) [Create Nonlinear Load Case from Load Combo](#)

Define Combination of Load Case Results:

Load Case Name	Load Case Type	Scale Factor
DEAD	Linear Static	1.
DEAD	Linear Static	1.
Pcm	Linear Static	1.
Wcm	Linear Static	1.
Pcv	Linear Static	1.
Empuje	Linear Static	1.

[Add](#) [Modify](#) [Delete](#)

[OK](#) [Cancel](#)

COMBINACIONES 1 Y 2 PARA ESTRIBOS

Load Combination Data

Load Combination Name (User-Generated): COMB3

Notes: [Modify/Show Notes...](#)

Load Combination Type: Linear Add

Options:

[Convert to User Load Combo](#) [Create Nonlinear Load Case from Load Combo](#)

Define Combination of Load Case Results:

Load Case Name	Load Case Type	Scale Factor
DEAD	Linear Static	1.3
DEAD	Linear Static	1.3
Pcm	Linear Static	1.3
Wcm	Linear Static	1.3
Pcv	Linear Static	2.2
Empuje	Linear Static	1.7

[Add](#) [Modify](#) [Delete](#)

[OK](#) [Cancel](#)

Load Combination Data

Load Combination Name (User-Generated): COMB4

Notes: [Modify/Show Notes...](#)

Load Combination Type: Linear Add

Options:

[Convert to User Load Combo](#) [Create Nonlinear Load Case from Load Combo](#)

Define Combination of Load Case Results:

Load Case Name	Load Case Type	Scale Factor
Pcm	Linear Static	1.
Pcm	Linear Static	1.
Wcm	Linear Static	1.
DEAD	Linear Static	1.
Empuje	Linear Static	1.
Sismo	Linear Static	1.

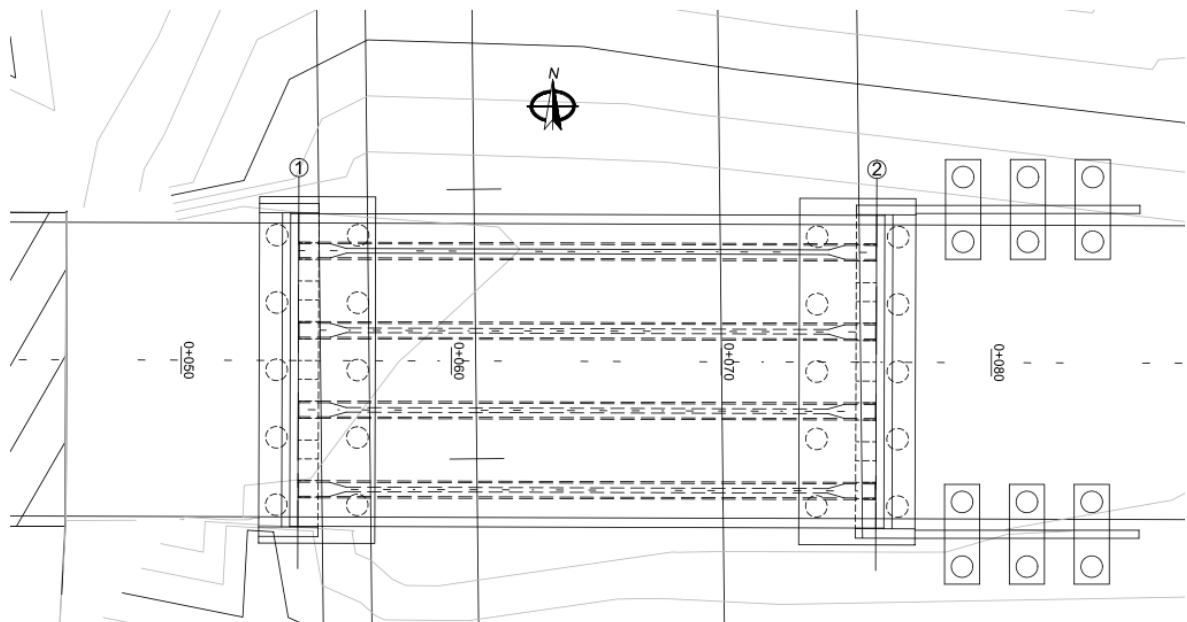
[Add](#) [Modify](#) [Delete](#)

[OK](#) [Cancel](#)

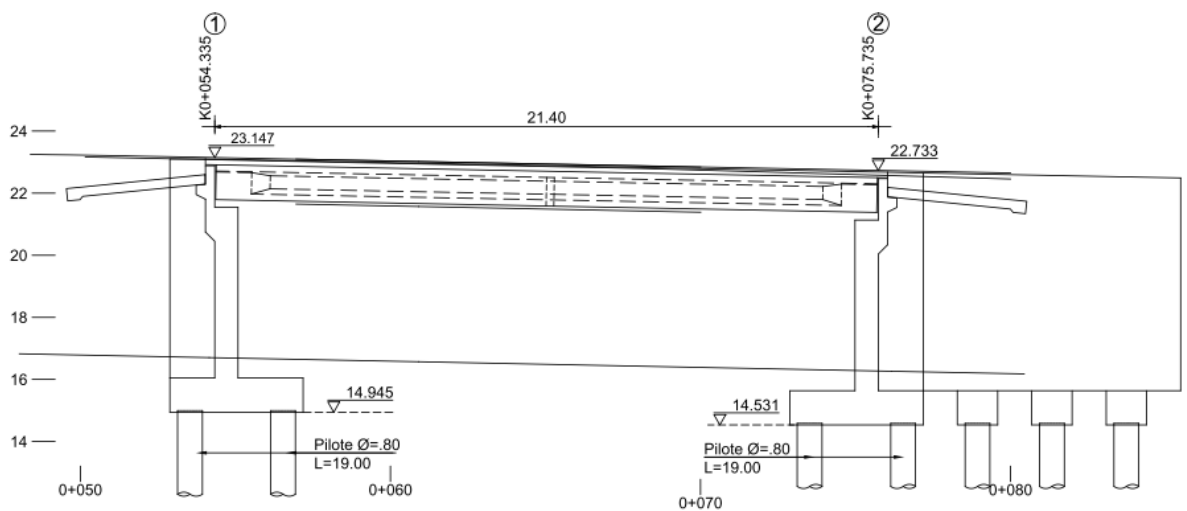
COMBINACIONES 3 Y 4 PARA ESTRIBOS

4. DESCRIPCIÓN DE LA ESTRUCTURA

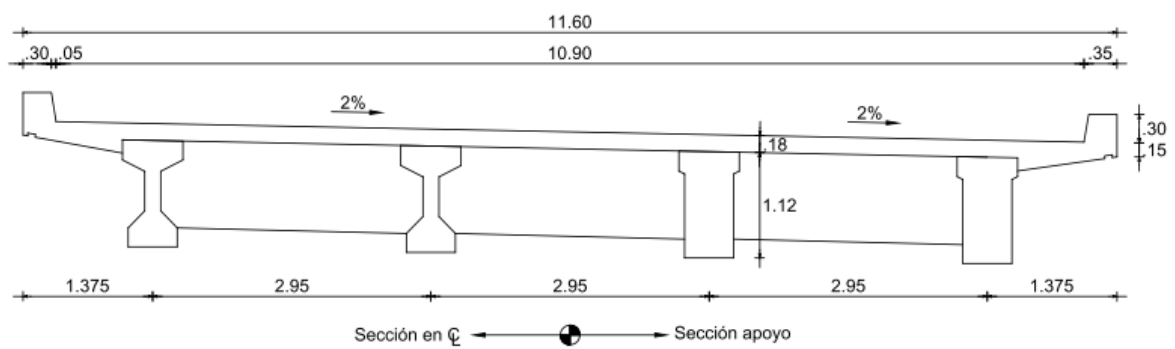
El puente Abocol es un puente bidireccional el cual tiene un lineamiento recto de una sola luz, con longitud total de 21.40 m. La superestructura está conformada por vigas preesforzadas de 21.35 m. y un tablero en concreto reforzado de ancho total de 11.60 m dentro de los cuales se incluyen dos (2) vías de circulación, dos (2) bermas de 1.8 m y dos (2) barreras de tráfico de 0.35 m cada una. La infraestructura, está constituida por estribos en concreto reforzado, los cuales transmiten las cargas a los estratos portantes por medio de pilotes de 0.8 m de diámetro y longitudes de 19.0m para todos los ejes.



PLANTA



PERFIL

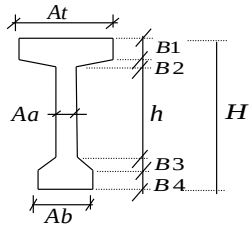


SECCIÓN TRANSVERSAL

5. DISEÑO SUPERESTRUCTURA

5.1. Viga

At= 64 cm
Aa= 18 cm
Ab= 52 cm
C1= 23 cm
C2= 17 cm
H= 112 cm
B1= 20 cm
B2= 12 cm
B3= 18 cm
B4= 20 cm
Ha= 42 cm



t= 18 cm
L= 21.3 cm
Sv= 3.05 m

b efect. 1	280	b efec. De calculo=	280
b efect. 2	533		
b efect. 3	305		

f'c viga= 350 k/cm²
f'c placa= 280 k/cm²
b efec.= 250.44
AREA FIG 1= 4198

Fig.	AREA	Y	A*Y	A*Y^2	Io
1	2016	56	112896	6322176	2107392.00
2	920	102	93840	9571680	30666.67
3	276	88	24288	2137344	2208.00
4	306	26	7956	206856	5508.00
5	680	10	6800	68000	22666.67
Σ	4198		245780	18306056	2168441.33

Fig.	AREA	Y	A*Y	A*Y^2	Io
1	4198	58.55	245780	18306056	2168441.33
2	4507.913043	121	545457.478	66000354.9	121713.652
Σ	8705.913043		791237.478	84306410.9	2290154.99

Yb=	58.55	Yt=	53.45	Ybc=	90.88506562	Ytc=	39.1149344
I=	6084833.59			I=	14684895.72	Ytc'=	21.1149344
St=	113835.06	Sb=	103930.88	Sbc=	161576.5541	Stc=	375429.384
r^2=	1449.46	kb=	27.12	r^2=	1686.772616	Stc'=	695474.372
kt=	24.76			Ktc=	18.55940362	Kbc=	43.1234934

Luz de Cálculo: 20.70 mts

Factor de reduccion por numero de carriles: 1.0

CARGAS, MOMENTOS Y ESFUERZOS DE PRIMER TENSIONAMIENTO

Peso propio viga: 1.01 T/m

$$M_{p.p} = \frac{W_{pp} * L^2}{8} = 53.96 \text{ T-m}$$

$$f_{pp}^b = -\frac{M_{pp}}{S_{bs}} = -51.92 \text{ k/cm}^2$$

$$f_{pp}^T = \frac{M_{pp}}{S_{ts}} = 47.41 \text{ k/cm}^2$$

Placa: 1.32 T/m

$$M_{pl} = \frac{W_{pl} * L^2}{8} = 70.57 \text{ T-m}$$

$$f_{pl}^b = -\frac{M_{pl}}{S_{bs}} = -67.90 \text{ k/cm}^2$$

$$f_{pl}^t = \frac{M_{pl}}{S_{ts}} = 62.00 \text{ k/cm}^2$$

$$f_{sa}^T = \frac{M_{sa}}{S_{ts}} = 0.00 \quad \text{k/cm}^2$$

Espesor de la Riostra: 0.3

Peso de la Riostra: 1.79 Ton

$$M_{rio} = \frac{W_{rio} * L}{4} = 9.28 \quad \text{T-m}$$

$$f_{rio}^b = -\frac{M_{rio}}{S_{bs}} = -8.93 \quad \text{k/cm}^2$$

$$f_{rio}^t = \frac{M_{rio}}{S_{ts}} = 8.15 \quad \text{k/cm}^2$$

PRIMER TENSIONAMIENTO:

$$f_{F1}^b = f_{p.p} + f_{p.pl} + f_{p.sob} + f_{p.rios}$$

$$f_{F1}^b = 128.75 \quad \text{k/cm}^2 \quad e_1 = y_{bs} - d_1' = 50.05$$

$$F_1 = \frac{f_{F1}^b * A_{ss}}{1 + \frac{e_1}{k_{ts}}} = 178.89 \quad \text{Ton}$$

Tensionar 2 cables; 7 torones
con tension efectiva total en el centro de la luz, de:

$$F_{1\infty} = 213.20 \quad \text{Ton}$$

$$F_{10} = 245.12 \quad \text{Ton}$$

COMPROBACION PARA PESO PROPIO:

Antes de pérdidas diferidas: (t=0)

$$f_{F0}^b = \frac{T_{10}}{A_{ss}} * (1 + \frac{e}{k_t}) = 176.43 \quad \text{k/cm}^2$$

$$f_{F0}^t = \frac{T_{10}}{A_{ss}} * (1 - \frac{e}{k_b}) = -49.38 \quad \text{k/cm}^2$$

Peso propio (t=0)

$$\sum f_0^b = 124.50 \quad \text{k/cm}^2$$

$$\sum f_o^t = -1.97 \quad \text{k/cm}^2$$

De donde:

$$f'_{ci} = f_0^b * 0.55 = 226.37 \quad \text{k/cm}^2$$

Se puede Tensionar cuando el concreto tenga una resistencia mínima de: 245.00 k/cm²

Después de pérdidas (t = ∞)

$$f_{F1}^b = \frac{f_{F0}^b}{F_{10}} * F_{1\infty} = 153.45 \quad \text{k/cm}^2$$

$$f_{F1}^t = \frac{f_{F0}^t}{F_{10}} * F_{1\infty} = -42.95 \quad \text{k/cm}^2$$

Esfuerzos antes del segundo tensionamiento: (t = ∞)

$$f^b = f_{F1}^b + f_{pp}^b + f_{pl}^b + f_{sa}^b + f_{rio}^b = 24.70 \quad \text{k/cm}^2$$

$$f^t = f_{F1}^t + f_{pp}^t + f_{pl}^t + f_{sa}^t + f_{rio}^t = 74.60 \quad \text{k/cm}^2$$

CARGAS PARA EL SEGUNDO TENSIONAMIENTO

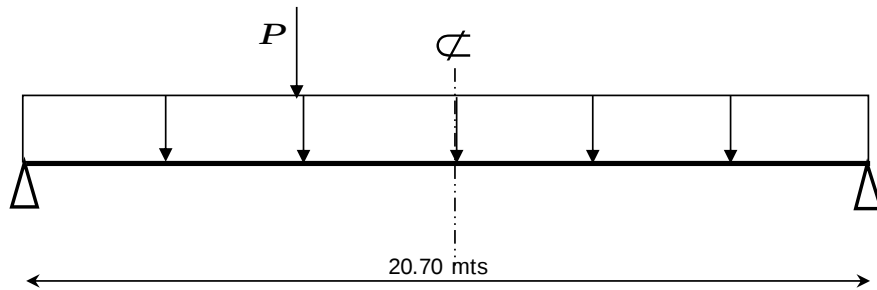
Cargas Comunes: 0.74 T/m

$$M_{cc} = \frac{W_{cc} * L^2}{8} = 39.64 \quad \text{T-m}$$

$$f_{cc}^b = -\frac{M_{cc}}{S_{bc}} = -24.53 \quad \text{k/cm}^2 \quad f_{cc}^t = \frac{M_{cc}}{S_{tc}} = 5.70 \quad \text{k/cm}^2$$

$$f^{t'} = \frac{M_{cc}}{S_{t'c}} = 10.56 \quad \text{k/cm}^2$$

CARGA VIVA



$$W = 1.50 - \frac{L-28}{200} = 1.5365 \quad P = 12$$

$$M_{cv-max} = \frac{W * L^2}{8} + \frac{P * L}{4} = 144.40 \quad \text{T-m/via}$$

$$f_{int} = \frac{S_v}{1.7} = 1.79 \quad I = \frac{16}{40 + L_c} = 0.26$$

$$M_{cv+I} = \frac{M_{cv}}{2} * f_{int} * (1 + I) * \%red = 163.68 \quad \text{T-m}$$

$$F_{cv+I}^b = -\frac{M_{cv+I}}{S_{bc}} = -101.30 \quad \text{k/cm}^2$$

$$F_{cv+I}^t = \frac{M_{cv+I}}{S_{tc}} = 23.53 \quad \text{k/cm}^2$$

SEGUNDO TENSIONAMIENTO

$$f_{F2}^b = f^b + f_{CC} + f_{CV+I} = 101.13 \text{ k/cm}^2$$

$$e_2 = y_{bc} - d_2 = 70.89 \text{ cm}$$

$$F_2 = \frac{f_{F2}^b * A_{sc}}{1 + \frac{e_2}{k_{tc}}} = 182.69 \text{ Ton}$$

Tensionar **2** cables **7 y 6 torones**
con tensión efectiva total en el centro de la luz, de: **198.58** Ton

$$f_{F2}^b = \frac{T_{efec.}}{A_{sc}} + \frac{T_{efec.} * e_2}{S_{bc}} = 109.93$$

$$f_{F2}^T = \frac{T_{efec.}}{A_{sc}} + \frac{T_{efec.} * e_2}{S_{tc}} = 2.57$$

COMPROBACION DE ESFUERZOS FINALES:

Cargas muertas + F1 + F2 < 0.4 fc

$$f_{t\infty}^b = 110.10 \text{ k/cm}^2$$

$f_b < 1.6 \times \text{RAIZ}(F'c)$

$$f_{t\infty}^b = 8.80 \text{ k/cm}^2$$

$$f_{t\infty}^t = 82.87 \text{ k/cm}^2$$

Cargas totales + F1 + F2 < 0.6 fc

$$f_{t\infty}^t = 111.27 \text{ k/cm}^2$$

CALCULO DEL CORTANTE

El cortante y los flejes se calculan cada 2.0 mts

$$\frac{V_u}{\phi} = V_c + V_s$$

$$V_c \leq V_{ci}$$

$$V_c \leq V_{cw}$$

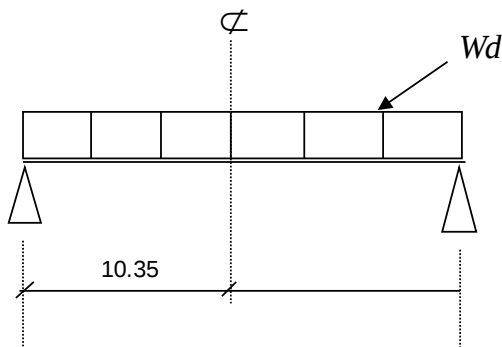
$$V_{ci} = 0.16 * \sqrt{f'_c} * b_w * d_p + V_d + \frac{V_i * M_{agr.}}{M_{max.}}$$

$$V_{cw} = \left(0.93 * \sqrt{f'_c} + 0.3 * f_{pc} \right) * b_w * d_p + V_p$$

$$M_{agr.} = \frac{I}{y_b} * \left(1.6 * \sqrt{f'_c} + f_{pe} - f_d \right)$$

CALCULO DEL V_{ci}

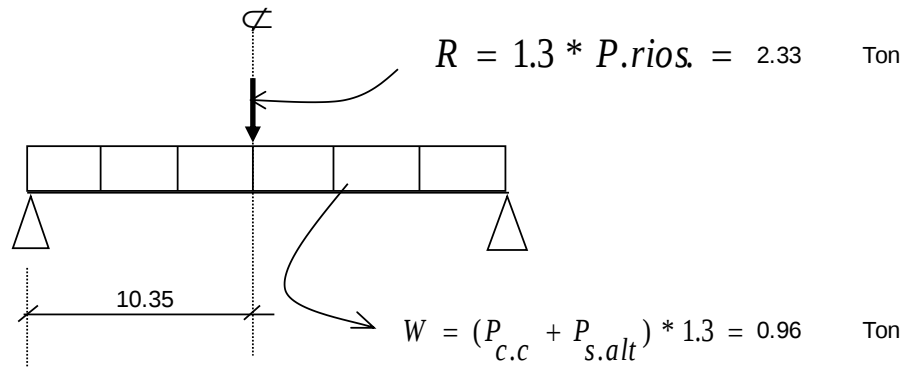
Para todas las expresiones se tomará como origen el centro de la luz.



$$V_{dz} = W_d * Z$$

$$W_d = W_{pp} + W_{pl} = 2.33 \text{ T-m}$$

$$M_d = \left(M_{p.p} + M_{p.pl} \right) - \left(W_{p.p} + W_{p.pl} + W_{s.al} \right) * \frac{Z^2}{2} = 124.54 \text{ T-m}$$



$$V_{i_{cm}} = R_a + (W * Z)$$

$$M_{max_{cm}} = (M_{p.rio} + M_{c.c}) * 1.3 = 63.59 \quad \text{T-m}$$

De tal manera que, para cualquier punto el momento será:

$$M_{max_z} = M_{max_{cm}} - \left(\frac{R}{2} * Z \right) - \left(W * \frac{Z^2}{2} \right)$$

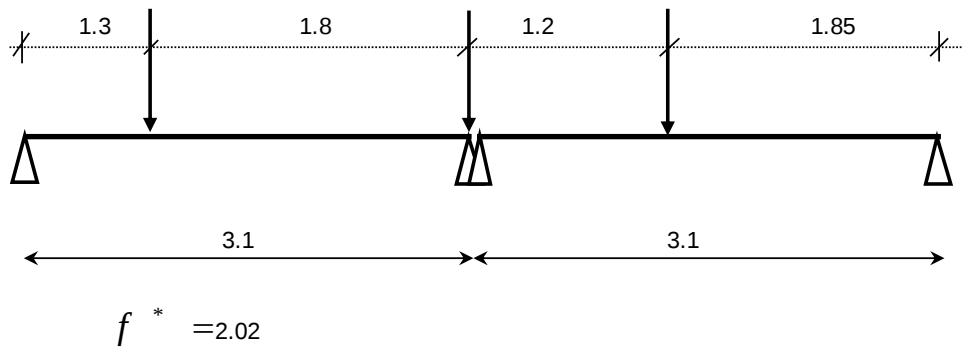
CARGA VIVA

$$M_{max} = 163.68 \quad \text{T-m}$$

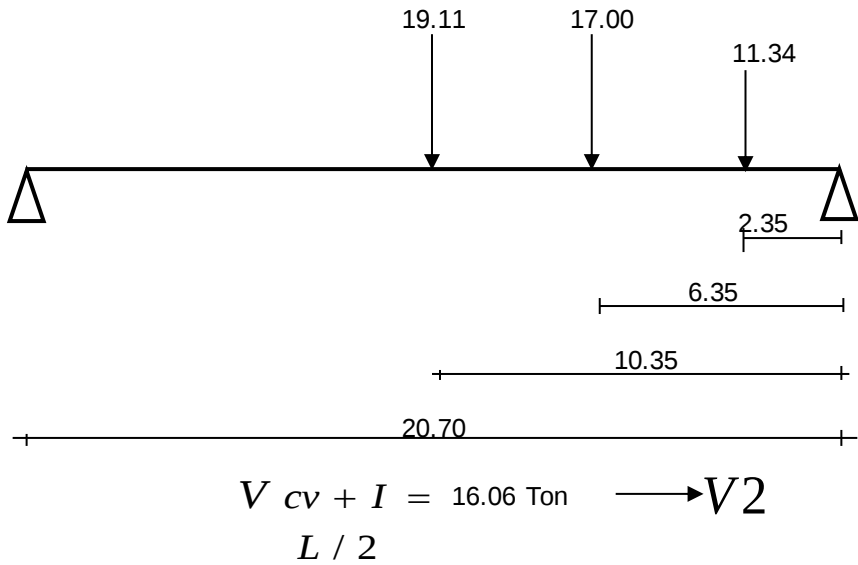
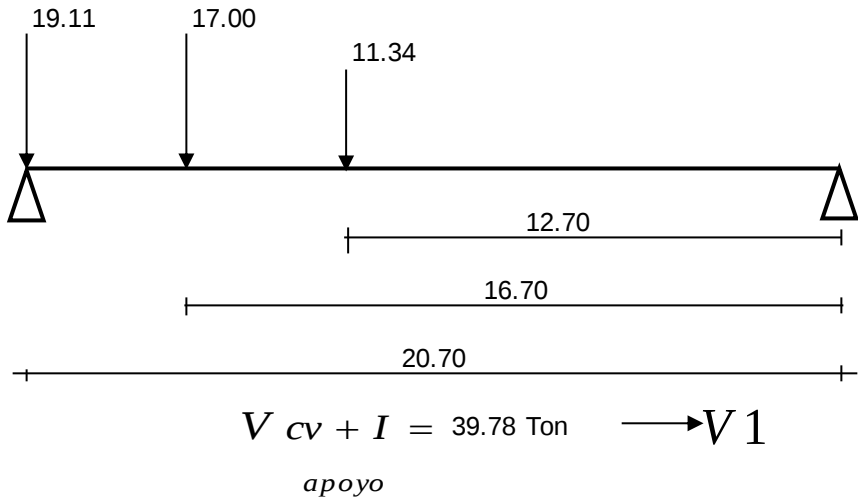
El momento de carga viva para cualquier punto es:

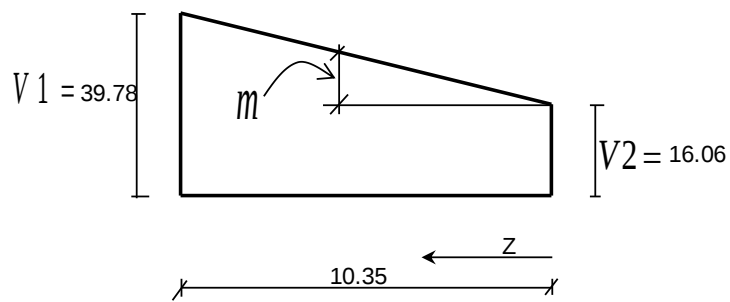
$$M_{max_z} = M_{max_{cv}} - \frac{M_{max_{cv}}}{\frac{L}{2}} * Z^2$$

CORTANTE (Alternativa de Camión)



Llanta posterior= 19.11 Ton
Llanta central= 17.00 Ton
Llanta delantera= 11.34 Ton





Por lo tanto:

$$\frac{V_1 - V_2}{L / 2} = \frac{m}{Z}$$

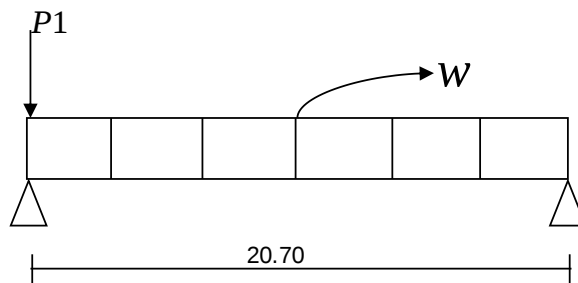
De donde:

$$m = \frac{(V_1 - V_2) * Z}{L / 2}$$

De esta forma llegamos a que: $V_Z = V_2 + N$

$$N = 2.29 * Z$$

CORTANTE (Alternativa de linea de carga)



$$w = 1.5 - \left(\frac{Lc - 24}{300} \right) = 1.511 \text{ T/m}$$

$$P = 16 \text{ Ton}$$

$$w_1 = \frac{w}{2} * f * (1 + I) = 1.70 \text{ T/m}$$

$$P_1 = \frac{P}{2} * f * (1 + I) = 20.34 \text{ T}$$

$$V_{cv} + I = 37.90 \text{ Ton}$$

apoyo

$\downarrow$

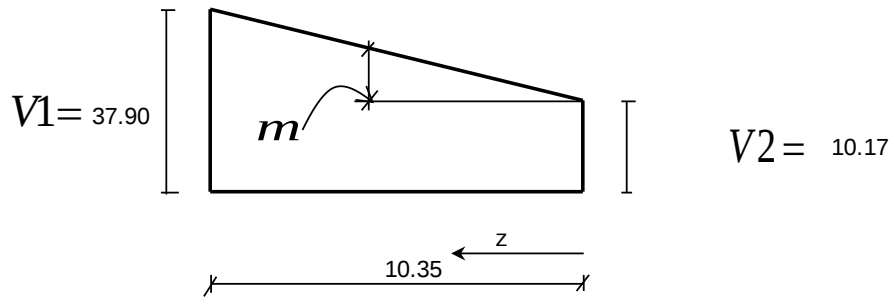
V_1

$$V_{cv} + I = 10.17 \text{ Ton}$$

c.luz

$\downarrow$

V_2



$$\frac{V_1 - V_2}{L / 2} = \frac{m}{Z} \implies m = \frac{(V_1 - V_2) * Z}{L / 2}$$

$$N = 2.68 * Z$$

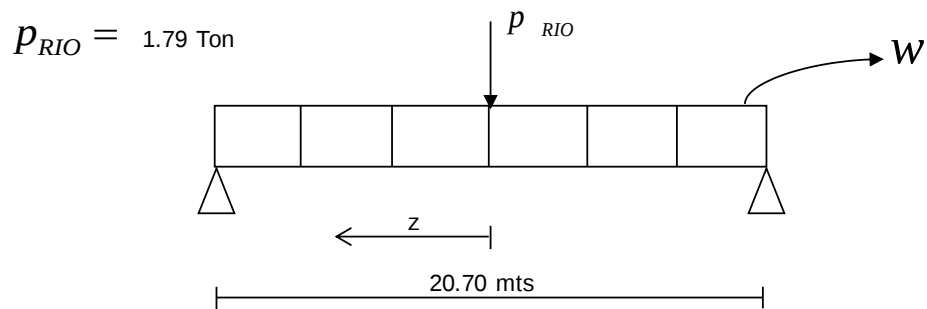
Por lo tanto: $V_Z = V_2 + N$

DISEÑO DE FLEJES

Cargas muertas:

Peso Propio:	1.01	T/m
Placa:	1.32	T/m
Sobre altura:	0	T/m
Cargas Comunes:	0.74	T/m

$$W = 3.07 \quad \text{T/m}$$



De donde: $V_Z = \frac{P_{rio.}}{2} + w * Z$

ALARGAMIENTOS

Tipo de anclaje movil-movil } movil-movil
 movil-fijo }

Area de los cables = 1.4

$\epsilon = 1925000$

Si es movil-movil

$$A = \frac{\left(\frac{F_{gato} + F_{cl}}{2} \right) * \frac{L}{2}}{\epsilon * A * \#_{tor}} = 7.61 \text{ cm}$$

Si es movil-fijo

$$A = \frac{\left[\left(\frac{F_{gato} + F_{cl}}{2} \right) + \left(\frac{F_{cl} + F_{fin}}{2} \right) \right] * \frac{L}{2}}{\epsilon * A * \#_{tor}} = 14.77 \text{ cm}$$

MOMENTO ÚLTIMO RESISTENTE

$$A_{ps} = (\#_{tor}^{1^{er} tens} + \#_{tor}^{2^{do} tens}) * A$$

$$A_{ps} = 37.80 \text{ cm}^2$$

$$d' = 14.04 \text{ cm}$$

$$dp = 115.96 \text{ cm}$$

$$\rho_p = \frac{A_{ps}}{b * d_p} = 0.00130$$

$$f_{ps} = f_{pu} \left[1 - \frac{\gamma_p}{\beta_1} * \rho_p * \frac{f_{pu}}{f'_c} \right]$$

$$f_{pu} = 18900 \quad \gamma_p = 0.4 \quad \beta_1 = 0.8$$

$$f_{ps} = 18235.8059 \text{ k/cm}^2$$

Altura bloque rectangular equivalente

$$t' = \frac{A_{ps} * f_{ps}}{0.85 * f'_c * d_p} \quad t' = 19.98 \text{ cm}$$

Trabaj como viga T

Si trabaja como viga "T"

$$\phi M_{resist.} = \phi \left[A_{ps} * f_{ps} * \left(d_p - \frac{t}{2} \right) \right]$$

$$\phi M_{resist} = 657.44 \text{ t-m}$$

$$M_{act} = \left[M_{pp} + M_{(pl+s.al)} + M_{rio} + M_{cc} \right] + M_{cv+I}$$

$$M_{act} = 337.13 \text{ t-m}$$

$$F_s = \frac{M_{u.resist}}{M_{act}} = 1.95011549$$

$$M_{u-act} = (1.3 * M_{cm}) + (2.2 * M_{cv+i})$$

$$M_{u-act} = 585.57 \text{ t-m}$$

$$M_{u-act} < M_{resist.}$$

Si trabaja como viga "T"

$$\phi M_{resist} = \phi^* \left[A_{pw}^* f_{ps}^* \left(d_p - \frac{a}{2} \right) + 0.85^* f'_c^* (b - b_w)^* h_f^* \left(d_p - \frac{h_f}{2} \right) \right]$$

$$A_{pf} = \frac{0.85 * f'_c * (b - b_w) * h_f}{f_{ps}} = 68.26 \quad \text{cm}^2$$

$$A_{pw} = A_{ps} - A_{pf} = -30.46 \text{ cm}^2$$

$$\phi M_{resist} = 668.529437$$

$$F_s = \frac{M_{u.resist}}{M_{act}} = 1.98$$

$$M_{u-act} = 585.57$$

$$M_{u-act} < M_{resist}.$$

CABL	Y cl	Yapo	Lcable	Lrecta	Tgato	£ Tor.	S. simple	S. compuesta
1	8.5	33	1052.5	300	143.8	7	Yb=	58.55 Ybc
2	8.5	83	1052.5	200	145.2	7	H=	1.12
						14		
3	20	112	945	100	143.5	7	7	7
4	20	112	825	1	124.0	6	6	
						13	13	7

COORDENADAS DE LOS CABLES

	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	10.52	gra	min	seg
1	8.5	8.5	8.5	8.5	8.9	10.2	12.4	15.4	19.3	24.1	29.7	33.0	3	43	32.3
2	8.5	8.5	8.5	9.5	12.6	17.7	24.9	34.1	45.4	58.7	74.1	82.9	9	54	50.5
d'1	8.5	8.5	8.5	9.0	10.8	14.0	18.6	24.8	32.4	41.4	51.9	57.9			
3	20.0	20.0	21.3	25.2	31.6	40.6	52.2	66.4	83.1	102.5	0.0	0.0	12	17	4.1
4	20.0	21.3	25.4	32.1	41.6	53.7	68.6	86.2	106.5	0.0	0.0	0.0	12	35	15.7
d'2	20.0	20.6	23.2	28.4	36.2	46.7	59.8	75.5	93.9	102.5	0.0	0.0			
e1	50.0	50.0	50.0	49.5	47.8	44.6	39.9	33.8	26.2	17.1	6.6	0.6			
e2	70.9	70.3	67.7	62.5	54.7	44.2	31.1	15.4	-3.0	-11.6	0.0	0.0			

d'p	14.0	14.3	15.6	18.3	23.0	29.7	38.5	49.2	62.0	48.0	26.9	30.0
dp	116.0	115.7	114.4	111.7	107.0	100.3	91.5	80.8	68.0	82.0	103.1	100.0

TENSIONAMIENTO EFECTIVO

ABSCISAS																						
Cable	Tgato	Tc	X	Tmax	Tc	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	16.8
1	143.80	129.03	1541	130.29	106.42	97.50	97.15	96.80	96.45	96.10	95.75	95.40	95.05	94.70	94.35	94.00	93.65	93.30	92.95	92.60	92.25	91.99
2	145.20	129.39	1208	130.35	106.78	102.01	101.06	100.10	99.14	98.19	97.23	96.27	95.32	94.36	93.40	92.44	91.49	90.53	89.57	88.62	87.66	86.94
Σ	289.00	258.42	2748.8	260.64	213.20	199.51	198.21	196.90	195.59	194.29	192.98	191.67	190.37	189.06	187.75	186.45	185.14	183.83	182.53	181.22	179.91	178.93
3	143.50	129.72	919	130.09	107.11	106.40	104.95	103.49	102.03	100.57	99.11	97.65	96.19	94.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	124.00	110.86	864	111.72	91.48	89.11	87.86	86.61	85.36	84.12	82.87	81.62	80.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Σ	267.50	240.57	1783.50	241.81	198.58	195.51	192.81	190.10	187.39	184.68	181.98	179.27	176.56	94.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

FUERZA VERTICAL LLEVADA POR LOS CABLES

Cable	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	16.8
Cable 1	0.00	0.00	0.00	0.00	0.83	1.66	2.49	3.30	4.11	4.91	5.71	5.74	7.28	8.05	8.82	9.58	10.33	10.89
Cable 2	0.00	0.00	0.00	2.05	4.06	6.03	7.96	9.83	11.67	13.45	15.18	15.15	18.50	-1.40	-1.27	-1.16	-1.06	-1.00
Cable 3	0.00	0.00	2.70	5.33	7.87	10.33	12.70	14.98	17.17	19.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cable 4	1.00	2.39	4.73	7.00	9.19	11.31	13.34	15.28	17.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Σ	1.00	2.39	7.44	14.38	21.96	29.33	36.48	43.39	50.08	37.62	20.89	20.89	25.78	6.65	7.55	8.42	9.27	9.89

ALARGAMIENTOS
MOVIL-FIJO

Area = 1.4 L = 33.75

€= 1925000

Alargamientos

	T gato	T cent luz	T extr.	# tor.	Long. Cable	Movil - Movil	Movil - Fijo	Alargamientos
Cable 1	143.80	134.57	127.513304	7	2105	7.765355885	15.07638505	15.076385
Cable 2	145.20	132.26	121.377494	7	2105	7.739975483	14.81540850	14.815408
					0			
Cable 3	143.50	129.72	117.860856	7	1890	6.843099794	13.04403180	13.044032
Cable 4	124.00	112.28	101.988006	6	1650	6.027504162	11.49347787	11.493478

TENSIONAMIENTO

	Longitud	F cent. Luz	Total
Cable 1	21.05	111.96	2356.80705
Cable 2	21.05	109.65	2308.185
Cable 6	18.90	107.11	2024.3241
Cable 7	16.50	92.90	1532.81969

tensionamiento total = 8222.13585

CORTANTE RESISTIDO POR EL CONCRETO

Z		0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	10.52
e1	cm	50.05	50.05	50.05	49.53	47.78	44.57	39.90	33.77	26.19	17.14	6.64	0.61
e2	cm	70.89	70.27	67.71	62.52	54.68	44.21	31.10	15.35	-3.03	-11.58	0.00	0.00
F1	Ton	213.20	199.51	198.21	196.90	195.59	194.29	192.98	191.67	190.37	189.06	187.75	186.45
F2	Ton	198.58	195.51	192.81	190.10	187.39	184.68	181.98	179.27	176.56	173.85	171.14	168.43
Vp	Ton	1.00	2.39	7.44	14.38	21.96	29.33	36.48	43.39	50.08	56.57	62.86	68.95
dp	cm	115.96	115.67	114.44	111.67	106.99	104.00	104.00	104.00	104.00	104.00	104.00	104.00
fp1	K/cm²	153.45	143.60	142.66	140.75	136.51	129.60	120.05	107.94	93.31	76.22	56.73	45.50
fp2	K/cm²	109.93	107.49	102.95	95.39	84.95	71.75	55.93	37.63	16.96	4.09	0.00	0.00
fp	K/cm²	263.38	251.09	245.61	236.14	221.46	201.35	175.99	145.57	110.28	80.32	56.73	45.50
Md	Ton-m	131.86	130.70	127.21	121.40	113.26	102.80	90.01	74.90	57.46	37.69	15.60	3.20
fd	K/cm²	126.87	125.75	122.40	116.81	108.98	98.91	86.60	72.06	55.28	36.27	15.01	3.08
M agr.	Ton-m	268.93	250.88	247.44	241.18	230.11	213.88	192.79	167.13	137.22	119.54	115.76	116.91
Vi	Ton	36.89	42.75	48.60	54.45	60.30	66.16	72.01	77.86	83.71	89.57	95.42	101.27
M max	Ton-m	472.91	467.68	454.34	432.87	403.29	365.58	319.76	265.81	203.74	133.56	55.25	-28.82
Vd	Ton	0.00	2.33	4.65	6.98	9.30	11.63	13.95	16.28	18.60	20.93	23.25	24.46
Vci	Ton	27.23	31.49	37.28	43.33	49.47	55.93	62.97	70.84	80.59	106.69	228.77	-380.76
fpc1	K/cm²	-5.92	-5.54	-5.50	-4.93	-3.08	0.26	5.05	11.26	18.85	27.81	38.10	43.81
fpc2	K/cm²	22.81	22.46	22.15	21.84	21.52	21.21	20.90	20.59	20.28	19.97	19.66	19.35
fpc	K/cm²	16.89	16.92	16.64	16.90	18.45	21.48	25.95	31.85	39.13	48.69	59.10	70.81
Vcw	Ton	47.89	49.18	53.56	59.55	66.13	73.96	83.62	93.85	104.63	115.92	127.76	139.15
Vc	Ton	27.23	31.49	37.28	43.33	49.47	55.93	62.97	70.84	80.59	91.92	104.63	118.95

ramas: 2
 ϕ que desea utilizar: 4 Diametro en cm: 1.27
 F_y= 4200

Z	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	10.52
V cm	0.90	3.96	7.03	10.09	13.16	16.22	19.29	22.35	25.42	28.48	31.55	33.14
V camión	16.06	18.35	20.64	22.93	25.23	27.52	29.81	32.10	34.39	36.69	38.98	40.17
V linea	10.17	12.85	15.53	18.21	20.89	23.57	26.25	28.93	31.61	34.29	36.97	38.36
V u	36.49	45.52	54.55	63.57	72.60	81.63	90.66	99.68	108.71	117.74	126.76	131.46
Vu/ϕ	42.93	53.55	64.17	74.79	85.41	96.03	106.65	117.27	127.89	138.51	149.14	154.66
V c	27.23	31.49	37.28	43.33	49.47	55.93	62.97	70.84	80.59	91.92	74.86	-380.76
V s	15.70245	22.06427	26.8879	31.46225	35.93886	40.09974	43.68391	46.43797	47.3084	46.59221	74.27791	535.4159
dp	115.96	115.67	114.44	111.67	106.99	104.00	104.00	104.00	104.00	104.00	104.00	104.00
S (f 1/2)	78.78344	55.92501	45.40364	37.86397	31.75794	27.66781	25.39773	23.89149	23.4519	23.81239	14.93677	2.072168
S (f 1/2)												

Wpp 1.01
 Wplaca 1.32
 Wsobre-alt 0.00
 Wriostra 1.79

COMPROBACION DE ESFUERZOS

Abscisa		0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	10.52
	cen. Luz												
Mpp	T-m	53.96	53.46	51.95	49.43	45.90	41.37	35.83	29.28	21.72	13.16	3.59	-1.79
M(pl+s.alt)	T-m	70.57	69.91	67.94	64.64	60.03	54.10	46.86	38.29	28.41	17.21	4.69	-2.34
Mriostra	T-m	9.28	8.38	7.49	6.59	5.69	4.80	3.90	3.00	2.11	1.21	0.31	-0.15
f ^b _{pp}	K/cm ²	-51.92	-51.4	-50.0	-47.6	-44.2	-39.8	-34.5	-28.2	-20.90	-12.66	-3.45	1.72
f ^t _{pp}	K/cm ²	47.41	46.96	45.64	43.42	40.32	36.34	31.47	25.72	19.08	11.56	3.15	-1.57
f ^b _{pl+sa}	K/cm ²	-67.90	-67.27	-65.37	-62.20	-57.76	-52.06	-45.08	-36.84	-27.33	-16.56	-4.51	2.25
f ^t _{pl+sa}	K/cm ²	62.00	61.42	59.68	56.79	52.74	47.53	41.16	33.64	24.96	15.12	4.12	-2.05
f ^b _{rio}	K/cm ²	-8.93	-8.06	-7.20	-6.34	-5.48	-4.61	-3.75	-2.89	-2.03	-1.16	-0.30	0.15
f ^t _{rio}	K/cm ²	8.15	7.36	6.58	5.79	5.00	4.21	3.43	2.64	1.85	1.06	0.28	-0.13
F1	T	213.20	199.51	198.21	196.90	195.59	194.29	192.98	191.67	190.37	189.06	187.75	186.45
e1	cm	50.05	50.05	50.05	49.53	47.78	44.57	39.90	33.77	26.19	17.14	6.64	0.61
F ₀	K/cm ²	245.12	231.43	230.13	228.82	227.51	226.21	224.90	223.59	222.29	220.98	219.67	218.37
F ^b _{F0}	K/cm ²	176.43	166.57	165.63	163.56	158.79	150.89	139.91	125.92	108.96	89.09	66.37	53.29
F ^t _{F0}	K/cm ²	-49.38	-46.62	-46.36	-45.06	-41.30	-34.68	-25.25	-13.07	1.82	19.36	39.51	50.85
f ^b _{F1}	K/cm ²	153.45	143.60	142.66	140.75	136.51	129.60	120.05	107.94	93.31	76.22	56.73	45.50
f ^t _{F1}	K/cm ²	-42.95	-40.19	-39.93	-38.78	-35.51	-29.79	-21.67	-11.21	1.55	16.56	33.77	43.42
f b(pp+Fo)		124.50	115.14	115.65	116.00	114.62	111.08	105.44	97.74	88.06	76.43	62.92	55.01
f t(pp+Fo)		-1.97	0.34	-0.72	-1.64	-0.97	1.66	6.22	12.65	20.90	30.92	42.66	49.28
f b(pp+pl+rio+sa+F1)		24.70	16.83	20.10	24.65	29.11	33.12	36.75	40.04	43.05	45.84	48.46	49.62
f t(pp+pl+rio+sa+F1)		74.60	75.55	71.97	67.22	62.56	58.30	54.39	50.79	47.45	44.30	41.32	39.66
M c.c	T-m	39.64	39.27	38.16	36.31	33.72	30.39	26.32	21.51	15.96	9.67	2.64	-1.31
Mcv+i	T-m	163.68	162.15	157.56	149.92	139.23	125.48	108.67	88.81	65.89	39.91	10.88	-5.42
f ^b _{cc}	K/cm ²	-24.53	-24.30	-23.61	-22.47	-20.87	-18.81	-16.29	-13.31	-9.87	-5.98	-1.63	0.81
f ^t _{cc}	K/cm ²	5.70	5.65	5.49	5.22	4.85	4.37	3.78	3.09	2.29	1.39	0.38	-0.19
f ^b _{cv+i}	K/cm ²	-101.30	-100.35	-97.52	-92.79	-86.17	-77.66	-67.26	-54.96	-40.78	-24.70	-6.74	3.36
f ^t _{cv+i}	K/cm ²	23.53	23.31	22.66	21.56	20.02	18.04	15.63	12.77	9.47	5.74	1.56	-0.78
F2	T	198.58	195.51	192.81	190.10	187.39	184.68	181.98	179.27	176.56	173.85	171.14	168.43
e2	cm	70.89	70.27	67.71	62.52	54.68	44.21	31.10	15.35	-3.03	-11.58	0.00	0.00
f ^b _{F2}	K/cm ²	109.93	107.49	102.95	95.39	84.95	71.75	55.93	37.63	16.96	4.09	0.00	0.00
f ^t _{F2}	Mpa	2.57	2.70	3.37	4.75	6.79	9.47	12.76	16.63	21.05	22.46	0.00	0.00
f ^b _(cm+F1+F2)	Mpa	110.10	100.01	99.44	97.57	93.19	86.06	76.39	64.35	50.14	43.95	46.83	50.43
f ^t _(cm+F1+F2)	Mpa	82.87	83.90	80.83	77.19	74.19	72.14	70.94	70.52	70.79	58.15	41.70	39.47
f ^b _(CM+CV+F1+F2)	Mpa	8.80	-0.34	1.92	4.78	7.02	8.41	9.13	9.39	9.36	19.25	40.09	53.78
f ^t _(CM+CV+F1+F2)	Mpa	106.41	107.22	103.48	98.75	94.21	90.18	86.56	83.29	80.26	63.89	43.26	38.69

CABL	Y cl	Yapo	Lcable	Lrecta	Tgato	N TOR.	ANGULO	ANG. (RAD.)	Gra	Min	Seg
1	8.5	33	1052.5	300	143.8	7	3.72562819	0.065024479	3	43	32.3
2	8.5	83	1052.5	200	145.2	7	9.9140178	0.173032253	9	54	50.5
SEGUNDO TENSIONAMIENTO											
3	20	112	945	100	143.5	7	12.2844775	0.214404579	12	17	4.1
4	20	112	825	1	124	6	12.5876934	0.219696695	12	35	15.7

k=	0.0025
μ=	0.25

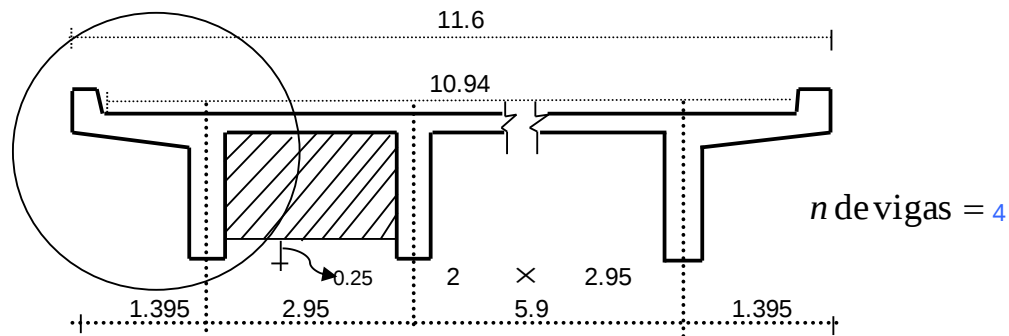
δ=	0.7
Area Torones	1.4

ε CABLE	T2	Tcl	fc	φ	β	δ=	X(M)	m (TON)	T(MAX)	perdidas	Lp	T apoyo	Text-1	T-ext-2
1	135.585417	134.57233	13731.87043	0.04256862	0.56737946	0.7	15.4108851	13.511312	130.29	22.61	5.5443	126.3123607	132.064353	127.513304
2	132.925463	132.262494	13496.17286	0.06957056	0.92386536	0.7	12.0770272	14.84528377	130.35	22.61	2.8677	122.8849058	129.473476	121.377494
3	130.041794	129.717095	18775.0898	0.07722614	1.59511474	0.7	9.19111971	13.40532546	130.09	22.61	-0.8259	114.1782189	127.005563	117.860856
4	112.28097	112.278163	18959.5007	0.07554917	1.80347962	0.7	8.64388076	12.28147392	111.72	19.38	1.4207	92.82187439	109.988893	101.988006

5.2. Tablero

DISEÑO DE LA PLACA

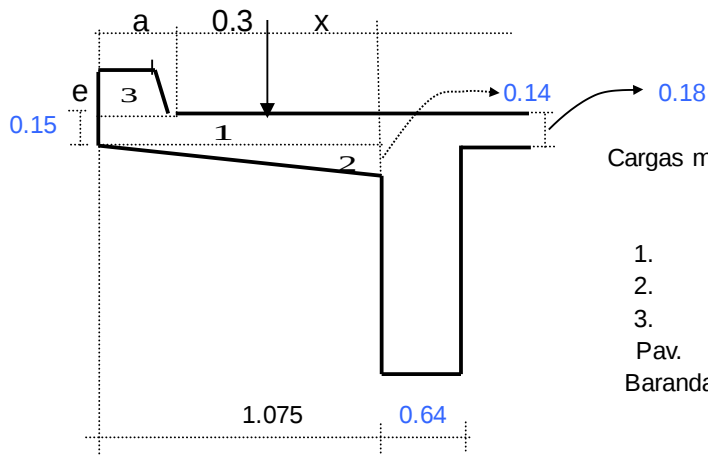
SECCION TRANSVERSAL



DISEÑO DE LA PLACA

VOLADIZO

a=(m)	0.35	$\gamma_{\text{pav}}=(t/m^3)$	2.0
x=(m)	0.425		
e=(m)	0.3		
esp. pav=(m)	0.1		
sep. Vig=(m)	2.95		



Cargas muertas:

	Carga (T)	× Brazo (m)	⇒ Mto (T-m)
1.	=	0.387	0.54
2.	=	0.181	0.36
3.	=	0.234	0.90
Pav.	=	0.145	0.36
Baranda.	=	0.085	0.08
		1.03	0.62

Cargas vivas:

$$E = 1.10 + 0.8 * \chi = 1.44$$

$$V_{cv+I} = \frac{7.5 * 1.3}{E} = 6.77 \text{ Ton}$$

$$M_{cv+I} = \frac{7.5}{E} * \chi * 1.3 = 2.88 \text{ T-m}$$

$$M_u = 1.3 * M_{cm} + 2.2 * M_{cv} = 7.14 \text{ T-m}$$

$$\begin{aligned} \text{Re cub.} &= 6 \text{ cm} & f_y &= 4200 \text{ k/cm}^2 & f'_c &= 280 \text{ k/cm}^2 \\ d &= 23 \text{ cm} & b &= 100 & \phi &= 0.9 \end{aligned}$$

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

De donde obtenemos:

$$\rho = 0.00369$$

$$A_s = \rho * b * d = 8.4839$$

Refuerzo:

Diametro #: 5 Separacion 23.34 cm

$$\begin{aligned} V_u &= 1.3 * V_{cm} + 2.2 * V_{cv} = 16.24 \text{ Ton} & v_u &= \frac{V_u * 1000}{\phi * b * d} = 8.31 \text{ k/cm}^2 \end{aligned}$$

Apoyos interiores y luces

$$W_{cm} = e_{pl} * \gamma_c + e_{pav} * \gamma_{pav} = 0.632 \text{ Ton/m}$$

Luz libre entre vigas: $S = 2.31 \text{ mt}$

$$M_{cm} = W_{cm} * \frac{l^2}{10} = 0.34 \text{ T-m}$$

$$M_{cv+I} = \frac{S + 0.6}{9.8} * Q * \beta * (1 + I) = 2.32 \text{ T-m}$$

$$M_u = 1.3 * M_{cm} + 2.2 * M_{cv+I} = 5.53 \text{ T-m}$$

Refuerzo en apoyos:

$$\begin{array}{llll} \text{Re cub.} = 5 & \text{cm} & f_y = 4200 \text{ k/cm}^2 & f'_c = 280 \text{ k/cm}^2 \\ d = 13 & \text{cm} & b = 100 \text{ cm} & \phi = 0.9 \end{array}$$

De donde obtenemos:

$$\rho = 0.009454$$

$$A_s = \rho * b * d = 12.29 \text{ cm}^2$$

Refuerzo:

Diametro #: 5 Separacion 16.11 cm

Refuerzo en las luces:

$$M_u = 5.53 \text{ T-m}$$
$$d = 13 \text{ cm} \quad d' = 5 \text{ cm}$$

Recubrimiento = 4 cm

De donde obtenemos:

$$\rho = 0.00945$$

$$A_s = \rho * b * d = 12.29 \text{ cm}^2$$

Refuerzo:

Diametro #: 5 Separacion 16.11 cm

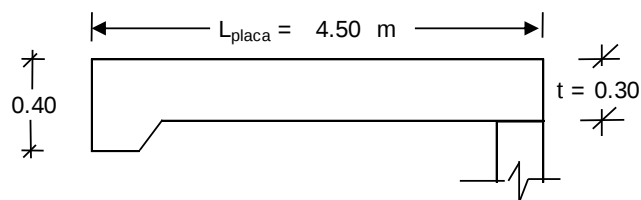
ARMADURA DE REPARTICION

$$\% = \frac{121}{\sqrt{S}} = 79.61 > 67 \%$$

$$A_{s.rep} = \frac{\%}{100} * A_s = 8.23 \text{ cm}^2$$

Diametro #: 4 Separacion 15.67 cm

5.3. Placa de acceso



SECCIÓN

DATOS GENERALES

Luz de cálculo = 4.20 m

Impacto = 20 %

Recubrimiento = 0.05 m

Materiales

Concreto : $f_c = 280 \text{ k/cm}^2$

Refuerzo : $f_y = 4200 \text{ k/cm}^2$

Relleno

Espesor = 0.35 m

Peso específico = 2.00 t/m³

Rodadura

Espesor = 0.05 m

Peso específico = 2.00 t/m³

Carga muerta

$$W_{cm} = t \text{ placa} \times \gamma_{con} + T_{rell} \times \gamma_{rell} + T_{rod} \times \gamma_{rod} = 0.30 \times 2.40 + 0.35 \times 2.00 + 0.05 \times 2.00 =$$

$$W_{cm} = 1.52 \text{ t/m}$$

$$M_{cm} = \frac{W_{cm} \times 4.20^2}{8} = 3.35 \text{ t-m/m}$$

Carga viva : Camión: C - 40- 95

$$M_{cv+i} = 1.40 \times 4.20 \times 1.20 = 7.06 \text{ t-m/m}$$

DISEÑO

$$M_u = 1.3 \times M_{cm} + 2.2 \times M_{cv+i} = 19.88 \text{ t-m/m}$$

$$\text{Sección : } b = 100 \quad d = 24$$

$$\rho = 0.0100$$

$$A_s = 23.9 \text{ cm}^2/\text{m}$$

$$\text{Colocar \# } 7 \text{ c / } 17$$

Refuerzo de repartición

$$A_{srep} = \frac{55}{\sqrt{L_c}} < 50 \% \Rightarrow A_{srep} = 27 \% = 0.27 \times 23.9 = 6.42 \text{ cm}^2/\text{m} \quad \# 4 \text{ c / } 19$$

6. DISEÑO ESTRIBO

6.1. Espaldar

SOLICITACIONES EMPUJE

$$K_a = 0.33$$

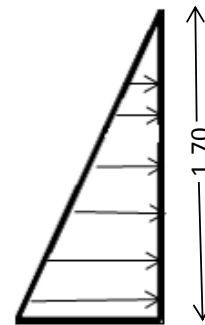
$$\gamma = 2.0$$

$$H = 1.7$$

$$E = \gamma \times K_a \times H$$

$$E = 2 \times 0.33 \times 1.7$$

$$E = 1.12$$



$$P = 1.12 \times 1.70 / 2 = 0.95$$

$$M = 0.95 \times 1.70 / 3 = 0.54$$

MONONOBE - OKABE

$$K_e = 0.03$$

$$\gamma = 2.0$$

$$H = 1.70$$

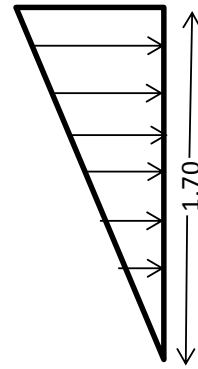
$$E = \gamma * K_e * H$$

$$E = 2 * 0.03 * 1.7$$

$$E = 0.10$$

$$P = 0.10 * 1.70 / 2 = 0.09$$

$$M = 0.09 * 2 * 1.70 / 3 = 0.10$$



SOBRECARGA

$$K_e = 0.33$$

$$\gamma = 2.0$$

$$H = 0.7$$

$$E = \gamma * K_e * H$$

$$E = 2 * 0.33 * 0.7$$

$$E = 0.46$$

$$P = 0.46 * 1.7 = 0.79$$

$$M = 0.79 * 1.70 / 2 = 0.67$$



GRU1May

$$Mu = (0.54 + 0.67) * 1.7 = 2.05 \text{ T-m}$$

GRU7

$$Mu = 0.54 + 0.10 = 0.64 \text{ T-m}$$

DISEÑO ESPALDAR

$$\begin{array}{llll} & b = & 100 & \\ H = 30 \text{ cm} & d = & 25.0 \text{ cm} & \\ & & & f_y = 4200 \text{ kg/cm}^2 \\ & & & f'_c = 280 \text{ kg/cm}^2 \\ & & & \gamma_s = 2.4 \text{ t/m}^2 \end{array}$$

Chequeo a flexión

$$M_u = 2.05 \text{ T-m}$$

Por lo tanto:

$$\rho = 0.000874$$

$$1.33\rho = 0.001162 \quad \rho = 0.001162$$

$$\begin{array}{lll} M_{cr} = & 5.96 & \text{T-m} \\ b = & 100 & \text{cm} \end{array}$$

$$\rho_{cr} = 0.002577$$

Por lo tanto

$$A_s = 2.91 \text{ cm}^2/\text{m}$$

6.2. Vástago

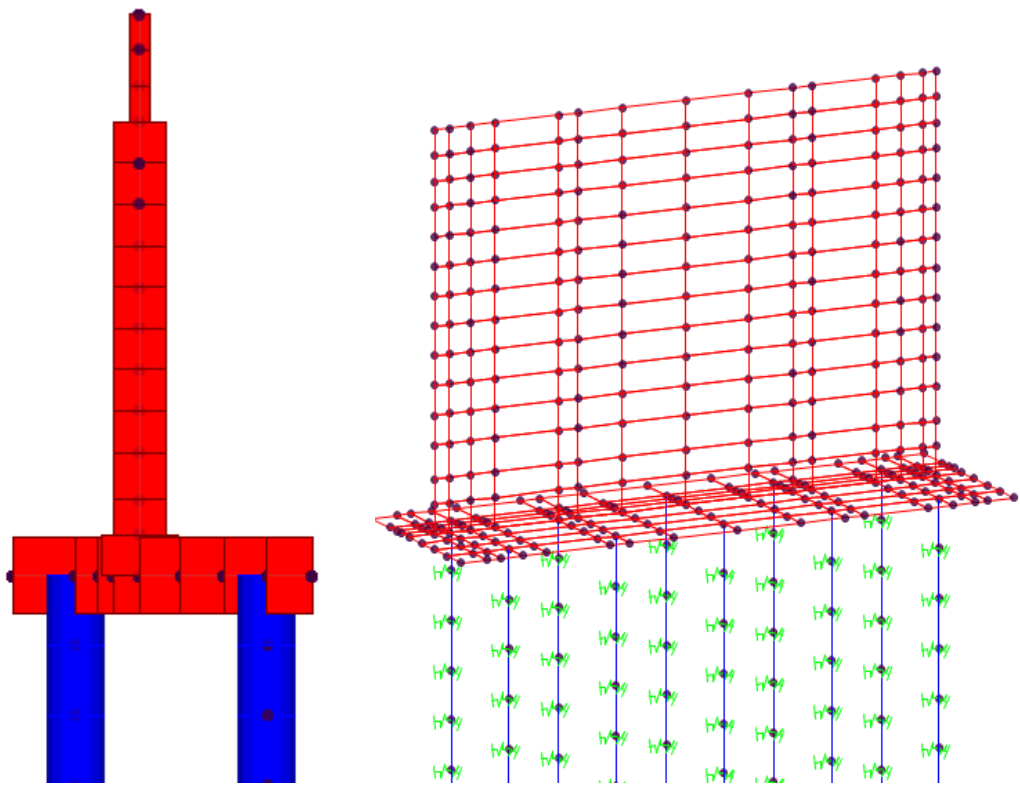


TABLA 2 MODELO ESTRIBO

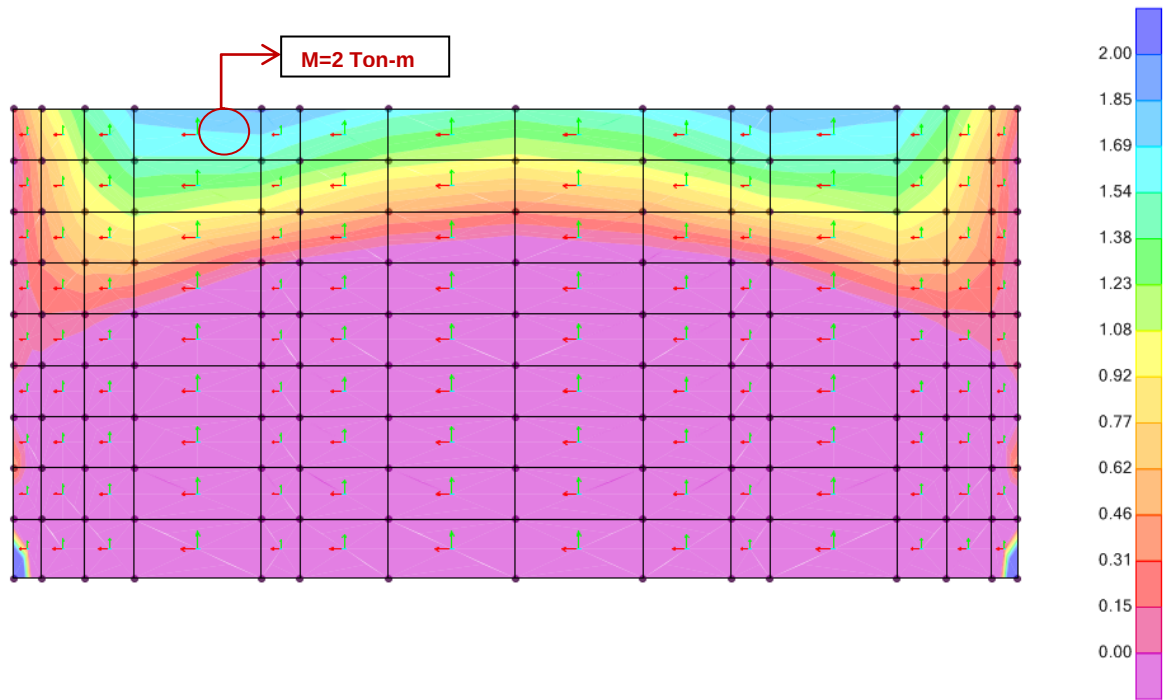


TABLA 3 DIAGRAMA DE MOMENTOS M1-1 MAX

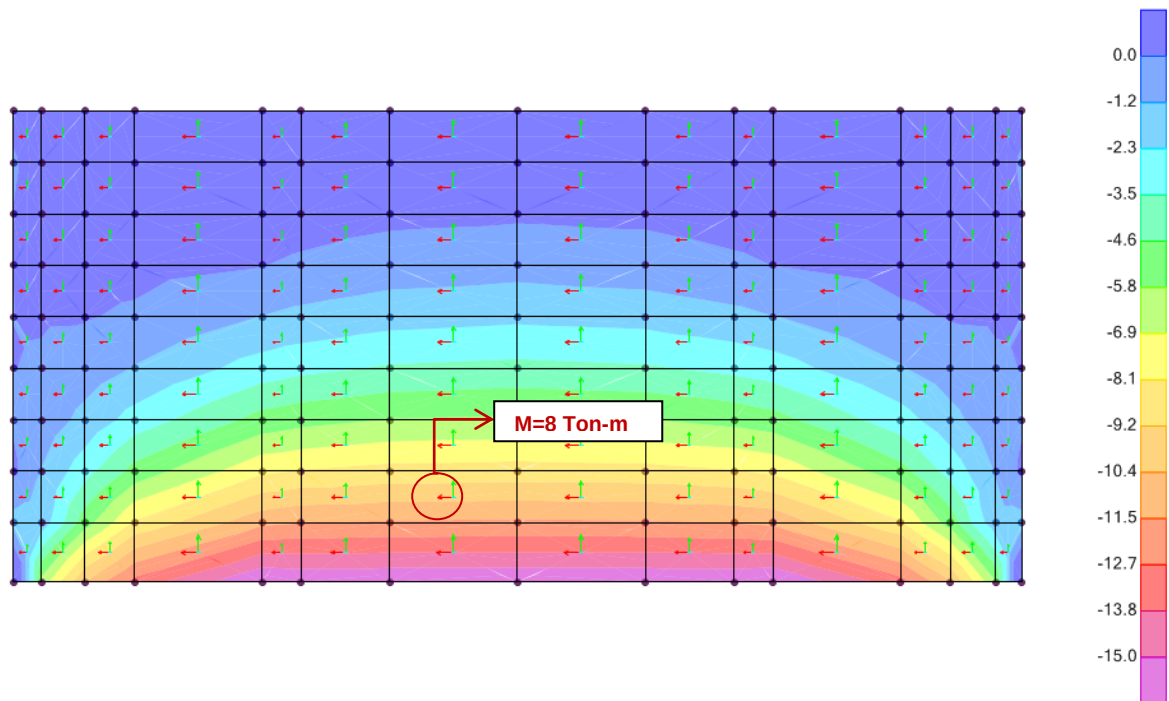


TABLA 4 DIAGRAMA DE MOMENTOS M1-1 MIN

DISEÑO FLEXIÓN

b=	100	cm	f_y=	4200	kg/cm ²
H=	75	cm	f'_c=	280	kg/cm ²
d'=	7.0	cm	φ=	0.9	

Mu =	8	Ton-m	Magr=	37.27	Ton-m
ρ =	0.00045956		ρ agr =	0.0021742	
As=	3.13	cm ²	As agr=	14.78	cm ²
1,33ρ =	0.00061122				
As 1,33=	4.16	cm ²	As Diseño=	4.16	cm ²

#Barra	Área (cm ²)	Ref Cada (m)
4	1.27	0.306

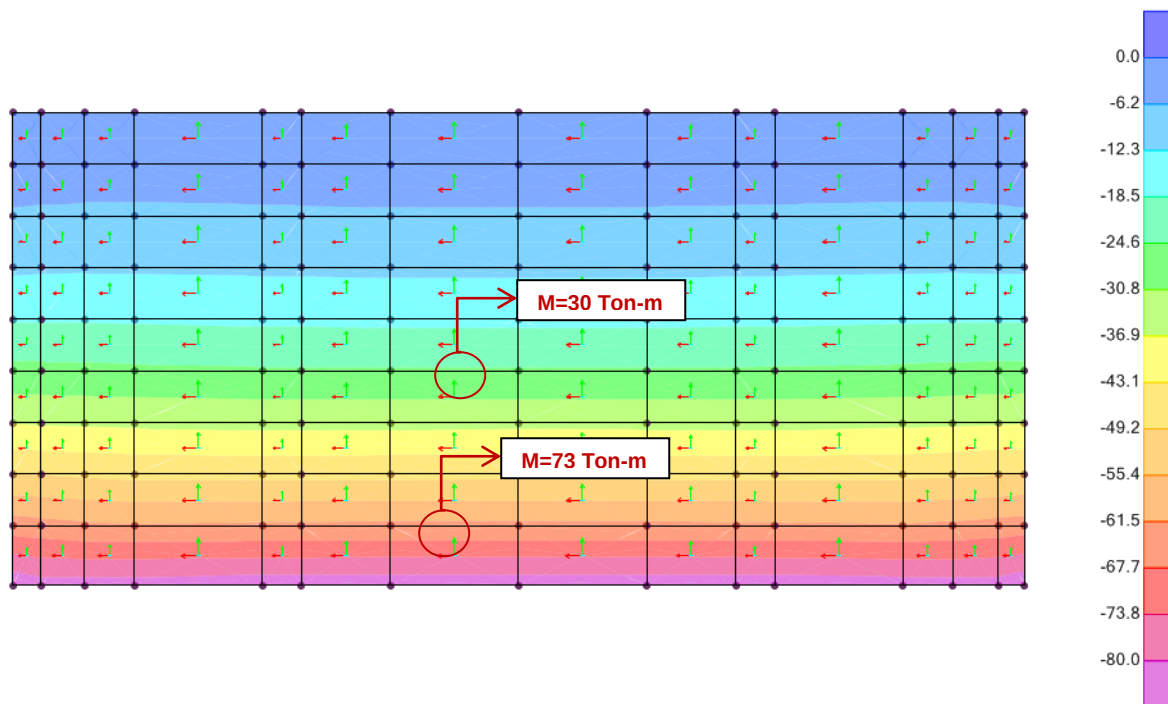


TABLA 5 DIAGRAMA DE MOMENTOS M2-2 MIN

DISEÑO FLEXIÓN

b=	100	cm	fy=	4200	kg/cm ²
H=	75	cm	f'c=	280	kg/cm ²
d'=	7.0	cm	φ=	0.9	

Mu =	73	Ton-m	Magr=	37.27	Ton-m
ρ =	0.00434293		ρ agr =	0.0021742	
As=	29.53	cm ²	As agr=	14.78	cm ²
1,33ρ =	0.00577609				
As 1,33=	39.28	cm ²	As Diseño=	29.53	cm ²

#Barra	Área (cm ²)	Ref Cada (m)
7	3.87	0.131

DISEÑO FLEXIÓN

b= 100 cm	f_y= 4200 kg/cm ²
H= 75 cm	f'_c= 280 kg/cm ²
d'= 7.0 cm	φ= 0.9

Mu = 30 Ton-m	Magr= 37.27 Ton-m
----------------------	--------------------------

ρ = 0.00174318	ρ agr = 0.0021742
-----------------------	--------------------------

As= 11.85 cm ²	As agr= 14.78 cm ²
----------------------------------	--------------------------------------

1,33ρ = 0.00231844

As 1,33= 15.77 cm ²	As Diseño= 14.78 cm ²
---------------------------------------	---

#Barra	Área (cm²)	Ref Cada (m)
7	3.87	0.262

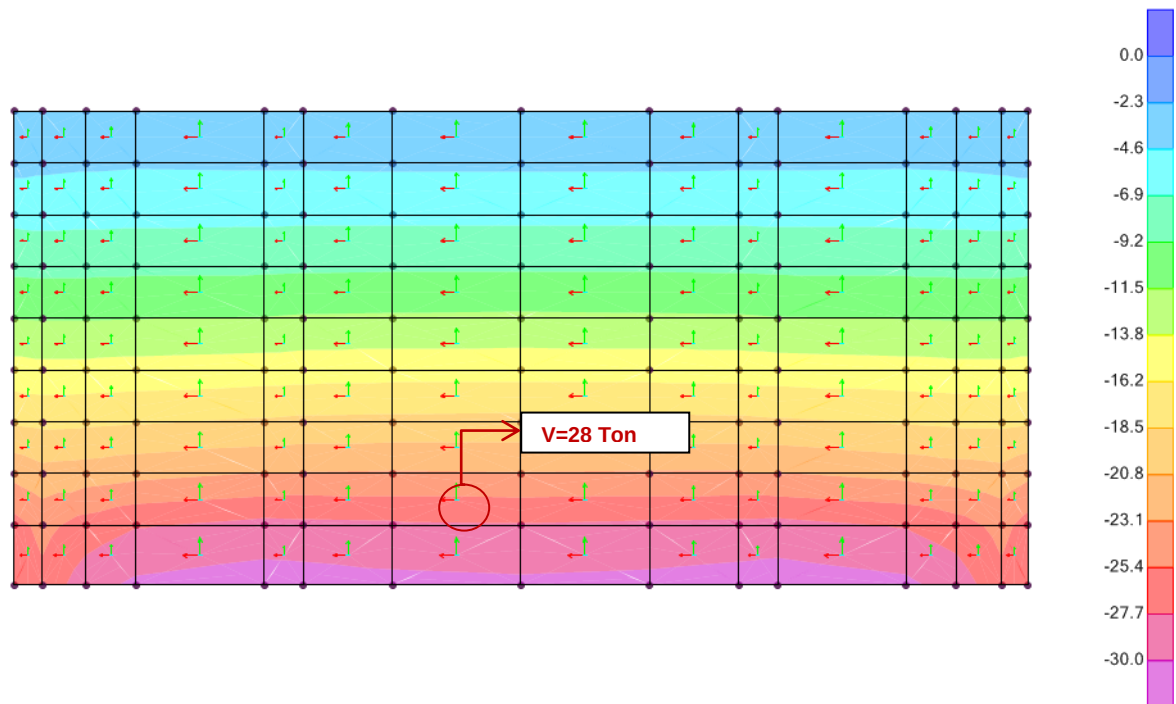


TABLA 6 DIAGRAMA DE CORTANTE V2-3 MIN

DISEÑO CORTANTE

b=	100	cm	fy=	4200	kg/cm ²
H=	75	cm	f'c=	280	kg/cm ²
d'=	7.0	cm	φ=	0.85	
#ramas	1	-			
#Barra	4				
Vu =	28	Ton	φ vc=	11.24	kg/cm ²
vu =	4.118	kg/cm ²			
S=	-6.369	cm			No necesita Refuerzo a cortante

6.3. Conectores sísmicos

DISEÑO DE CONECTORES

P= 340.0 T **No Conec= 3**

$A_a = 0.10$

Peso x apoyo= $340/2 = 170$ T

$P_{XCONECTOR} = 56.67$ T

$P_{XCHORIZ} = 56.67 * 0.1 =$ 5.7 T

Item	Vu	As	Ø
Ejes	T	cm ²	
1/3	5.7	2.0	2 Ø 1

As (cm²) = Vu / R / .85 / 4.2

R = 0.8 - para conectores

Vu = cortante tomado por el conector

6.4. Tope sísmico

TOPES SISMICOS ESTRIBO

Datos generales : $C_m \text{ sup} = 0 \text{ t}$ $C_v+i \text{ sup} = 0 \text{ t}$ $P_u = 18.0 \text{ t}$

Materiales: Concreto: $f_c = 280 \text{ k/cm}^2$ Refuerzo: $f_y = 4200 \text{ k/cm}^2$

Sección : Bapoyo = 75.0 cm $h = 111 \text{ cm}$ $d = 106 \text{ cm}$ $a = \text{dist. aplicar carga} = 36$

$\text{Rec} = 5 \text{ cm}$ $b \text{ max} = 75 \text{ cm}$

$B_{\text{flexión}} = \text{Bapoyo} + 5(a + \text{rec}) = 280 > S_v \Rightarrow b = 75$ $B_{\text{corte}} = \text{Bapoyo} + 4a = 219 \text{ cm}$

$V_u \leq 0.85 \times 0.2 \times f_c \times A_c = 1105 \text{ t} \Rightarrow \text{Sección apta}$

Determinación del refuerzo A_v para corte por fricción $A_v = V_u / \phi / f_y / \mu = 3.6 \text{ cm}^2$

$\mu = 1.4$ concreto vaciado monolíticamente $\phi = 0.85$

Determinación del refuerzo A_n para tracción directa

$N_u > 0.20 V_u = 3.6 \text{ t}$ $N_u \leq \phi A_n f_y$ $A_n = N_u / \phi / f_y = 1.0 \text{ cm}^2$

Determinación del refuerzo A_f para flexión

$M_u = V_u \times a + N_u \times (h - d) = 6.7 \text{ t-m}$ $\rho = 0.00029$ $A_f = 2.3 \text{ cm}^2$

Determinación del refuerzo principal - A_{sp}

$A_{sp1} = A_f + A_n = 3.3 \text{ cm}^2$ $A_{sp2} = 2/3 A_v + A_n = 3.4 \text{ cm}^2$ $A_{sp} = 3.4 \text{ cm}^2$
3 $\phi 1/2"$

Determinación de cuantía mínima - $A_{smín}$ $= 0.04 f_c / f_y \times b \times d$ $A_{mín} = 21.2 \text{ cm}^2$
17 $\phi 1/2"$

Determinación del refuerzo secundario - A_h $> 0.5 \times (A_{sp} - A_n) =$ $A_h = 10.1 \text{ cm}^2$

6.5. Zapata

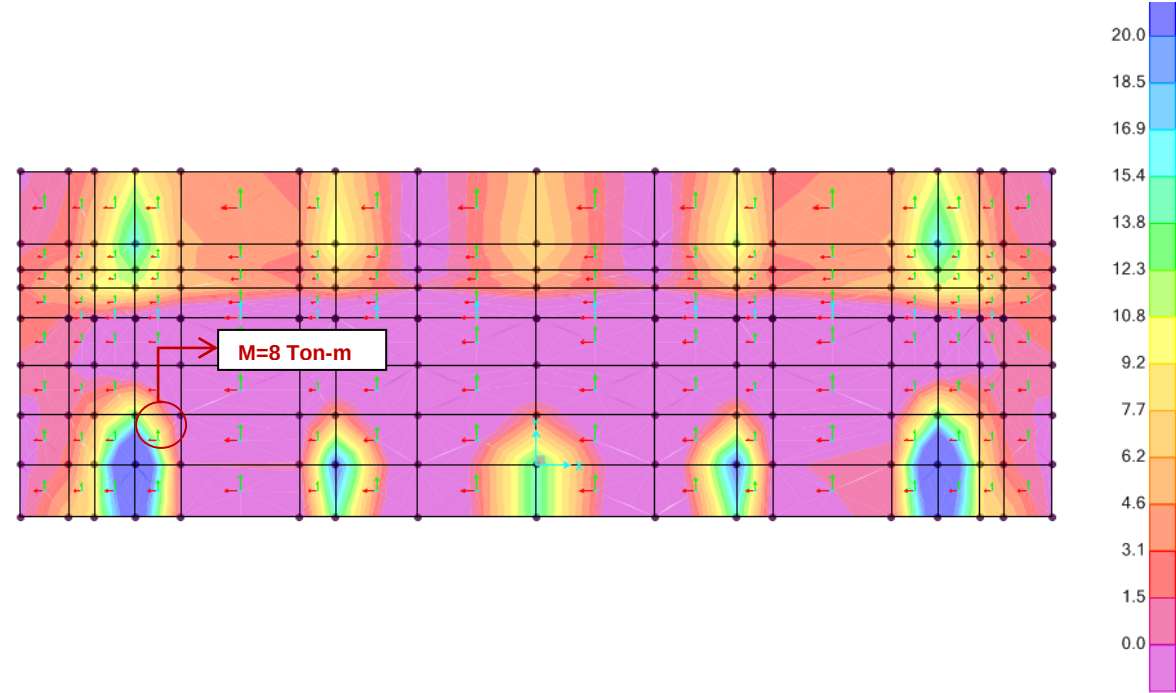


TABLA 7 DIAGRAMA DE MOMENTOS M1-1 MAX

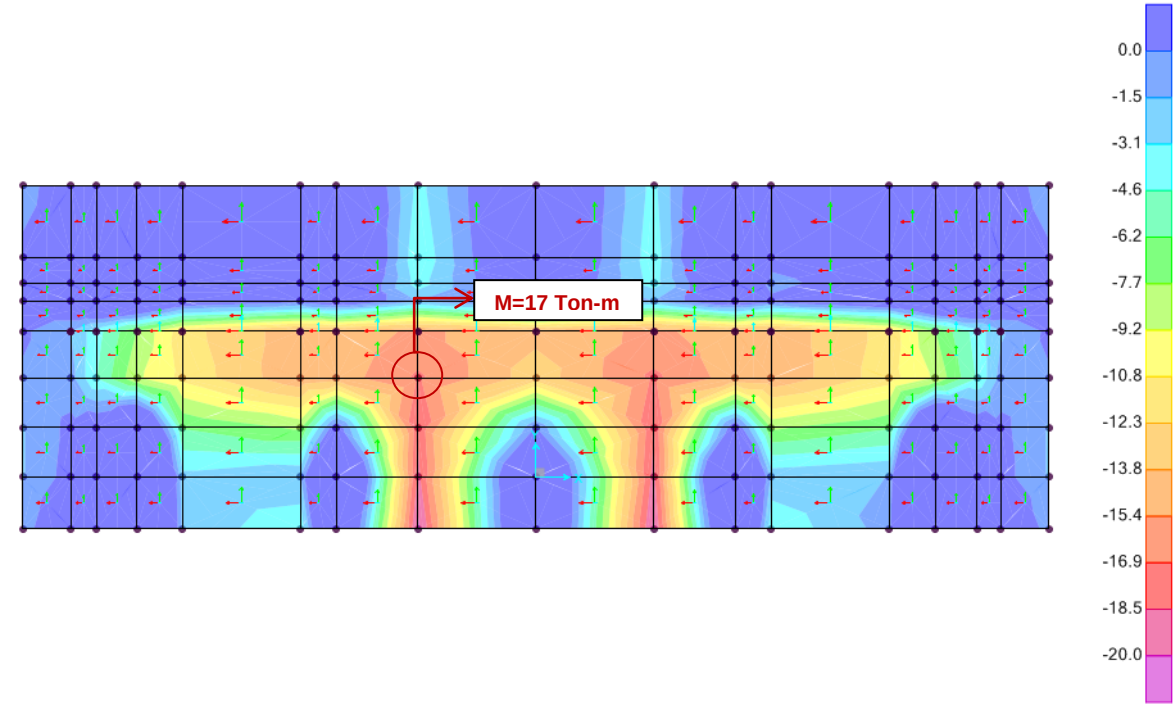


TABLA 8 DIAGRAMA DE MOMENTOS M1-1 MIN

DISEÑO FLEXIÓN

b=	100	cm	f_y=	4200	kg/cm ²
H=	110	cm	f'_c=	280	kg/cm ²
d'=	7.0	cm	φ=	0.9	

Mu = 17 Ton-m	Magr= 80.18 Ton-m
-----------------------------	----------------------------

ρ = 0.00042552	ρ agr = 0.0020359
-----------------------	--------------------------

As= 4.38 cm ²	As agr= 20.97 cm ²
-------------------------------------	--

1,33ρ = 0.00056594

As 1,33= 5.83 cm ²	As Diseño= 5.83 cm ²
--	---

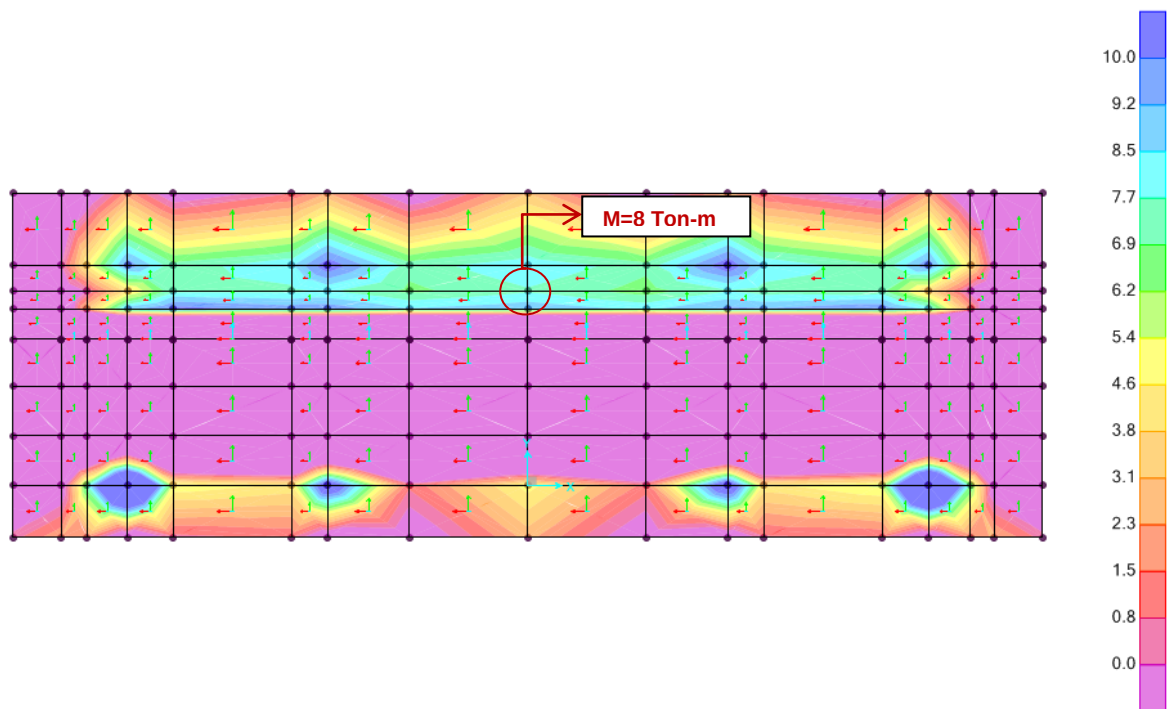


TABLA 9 DIAGRAMA DE MOMENTOS M2-2 MAX

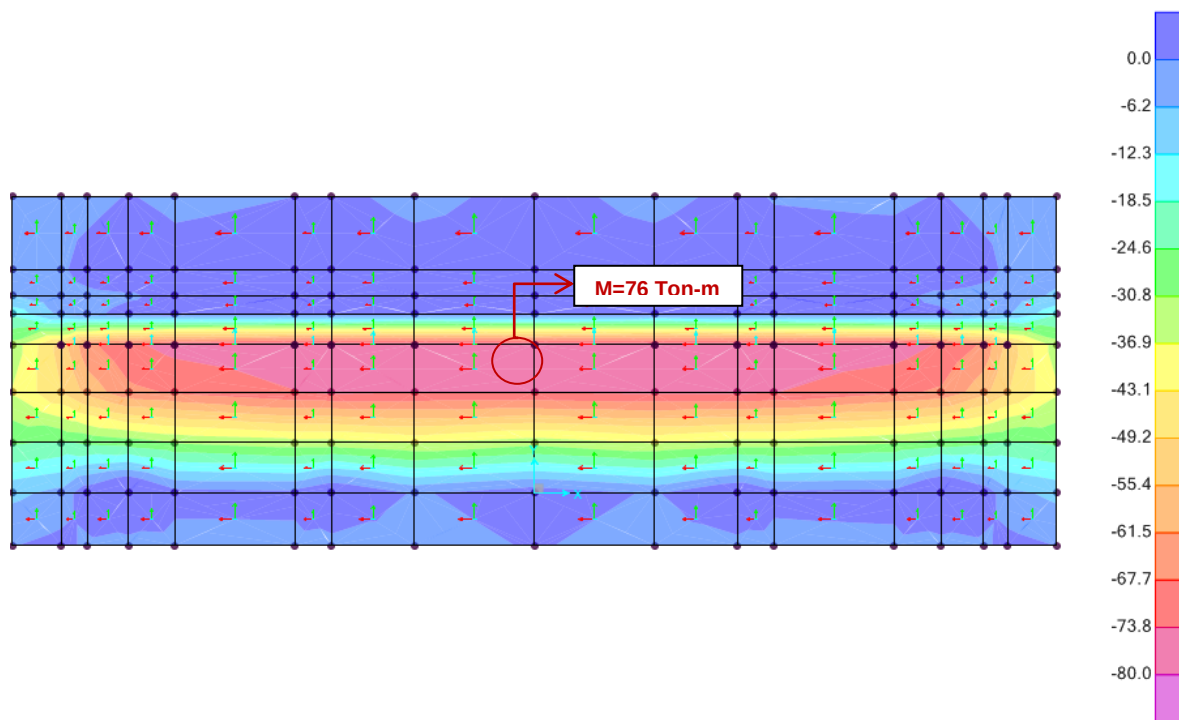


TABLA 10 DIAGRAMA DE MOMENTOS M2-2 MIN

DISEÑO FLEXIÓN

b=	100	cm	f_y=	4200	kg/cm ²
H=	110	cm	f'_c=	280	kg/cm ²
d'=	7.0	cm	φ=	0.9	

Mu =	76	Ton-m	Magr=	80.18	Ton-m
ρ =	0.00192796		ρ agr =	0.0020359	
As=	19.86	cm ²	As agr=	20.97	cm ²
1,33ρ =	0.00256419				
As 1,33=	26.41	cm ²	As Diseño=	20.97	cm ²

#Barra	Área (cm²)	Ref Cada (m)
7	3.87	0.185

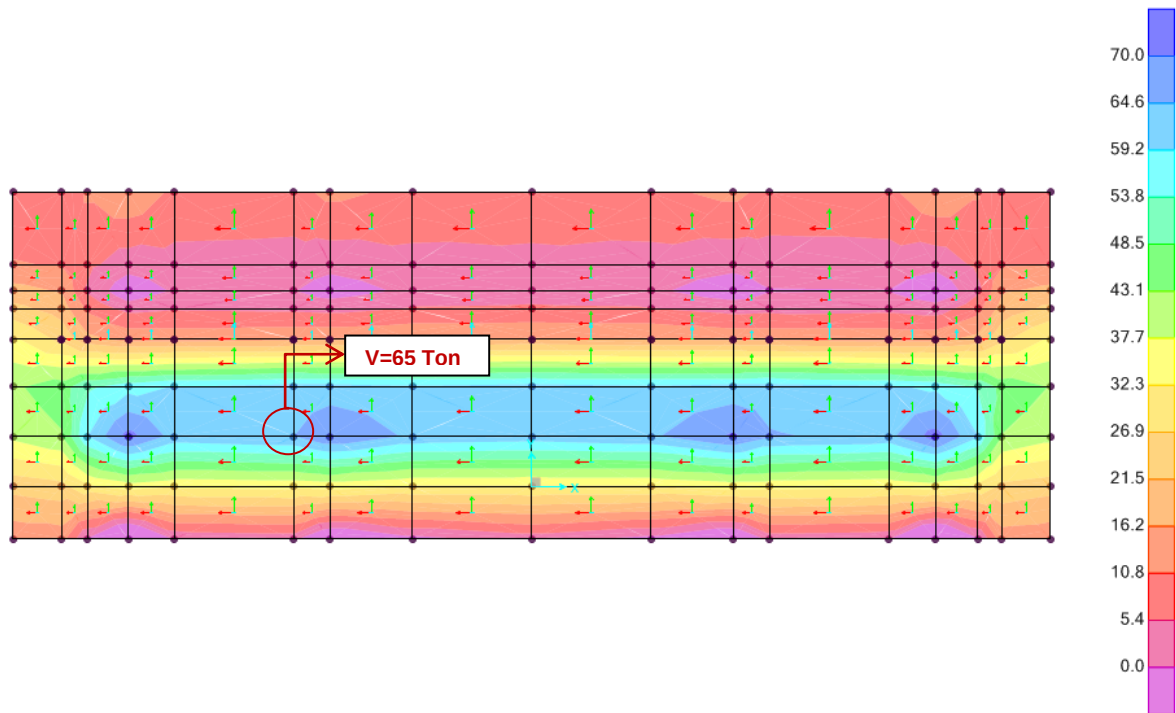


TABLA 11 DIAGRAMA DE CORTANTE V2-3 MAX

DISEÑO CORTANTE

b=	100	cm	fy=	4200	kg/cm ²
H=	110	cm	f'c=	280	kg/cm ²
d'=	7.0	cm	φ=	0.85	
#ramas	1	-			
#Barra	4				
Vu =	65	Ton	φ vc=	11.24	kg/cm ²
vu =	6.311	kg/cm ²			
S=	-9.205	cm	No necesita Refuerzo a cortante		

6.6. Pilotes estribo

A partir del modelo realizado, se verificaron las cargas y solicitaciones en los pilotes. Se dispondrán zapatas rectangulares con 10 pilotes de 0.80 m de diámetro y 19m de profundidad en ambos ejes. A continuación se presenta el diseño correspondiente a este elemento.

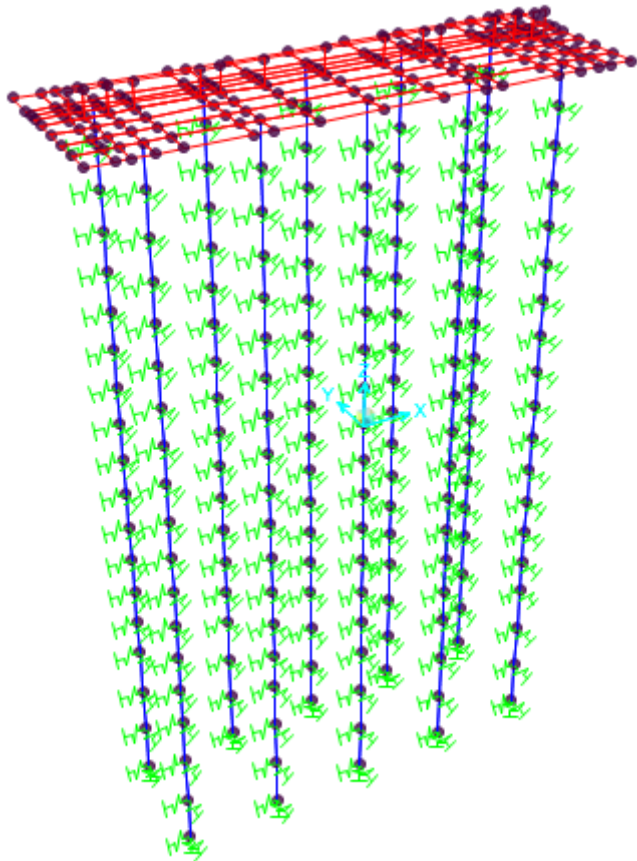


TABLA 12 MODELO PILOTES

Capacidad Portante

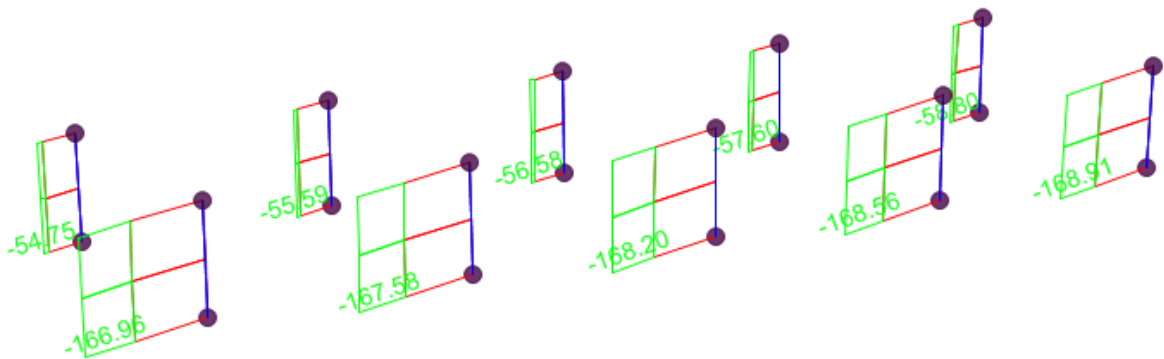


ILUSTRACIÓN 1 FUERZA AXIAL POR CARGA DE DISEÑO EN PILOTES

Estribo Eje 1 y 2				
Características del depósito				
Profundidad (m)	Diámetro (m)	γ_t (Ton/m ³)	Capacidad Portante	Total
			(Ton)	(Ton)
19	0.80	2.0	169	169

TABLA 13 VALORES CAPACIDAD PORTANTE PILOTES

Diseño flexión

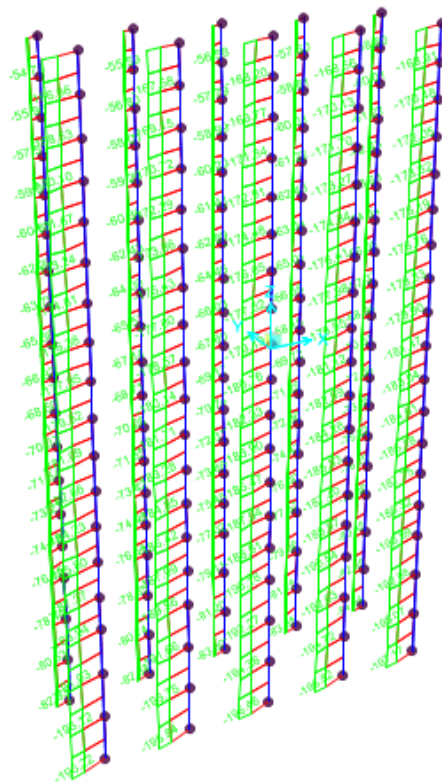


ILUSTRACIÓN 2 DIAGRAMA DE CARGA AXIAL (TON)

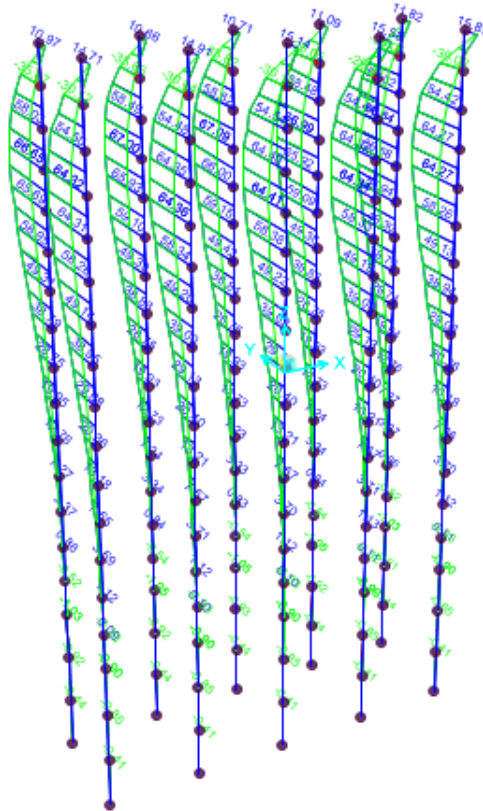


ILUSTRACIÓN 3 DIAGRAMA DE MOMENTOS 2-2 (T-M)

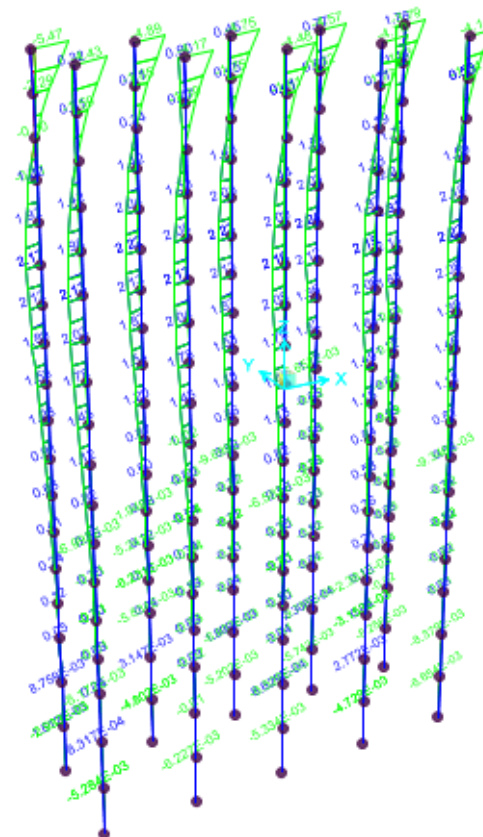


ILUSTRACIÓN 4 DIAGRAMA DE MOMENTOS 3- (T-M)

Con el fin de generar los diagramas de interacción por resistencia y por evento extremo se utilizaron los valores consignados en el Anexo 1.

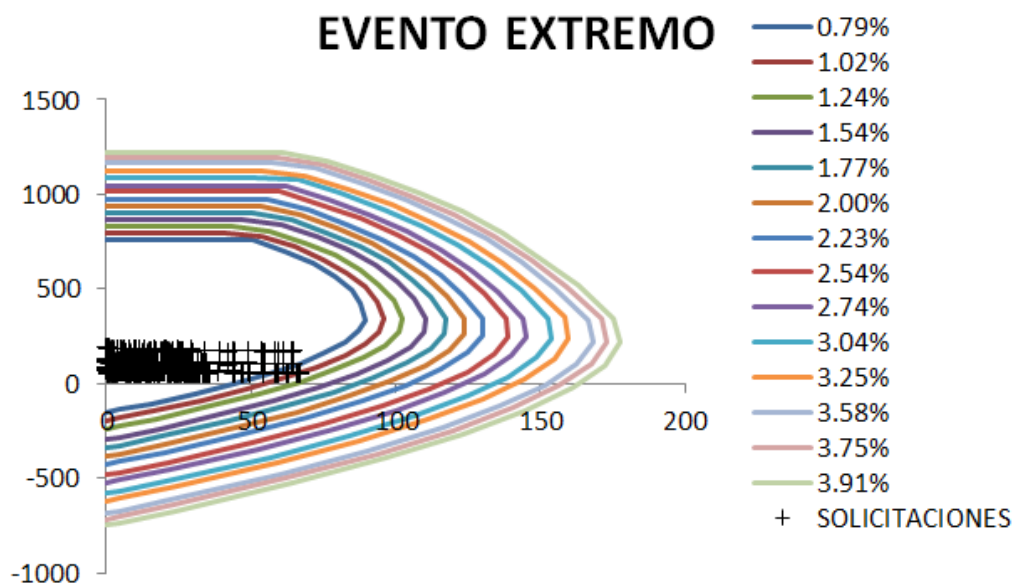


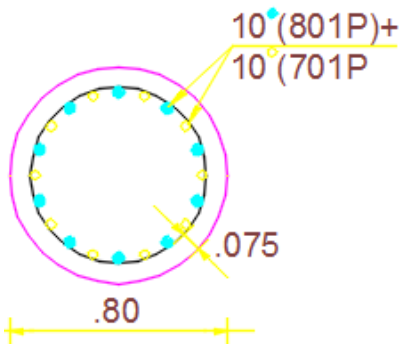
ILUSTRACIÓN 5 DIAGRAMA DE INTERACCIÓN AXIAL Y MOMENTO DE DISEÑO

A partir de las solicitaciones últimas de resistencia y evento extremo en los pilotes establecemos la cuantía de acero necesaria con las solicitaciones más desfavorables, la cual es del 1.24%. Esta cantidad de acero debe sumistrarse de tal manera que cumpla con el As requerido.

Cantidad de Refuerzo Requerida			
Ø	Area	%	AS (cm²)
0.8	0.50	1.24	62.33

Se colocan 10 varillas de 1" y 10 varillas de 7/8" de manera que cumple con el As requerido:

$$10 \times 5.10 \text{ cm}^2 + 10 \times 3.87 \text{ cm}^2 = 89.70 \text{ cm}^2$$



Verificación a cortante en pilotes

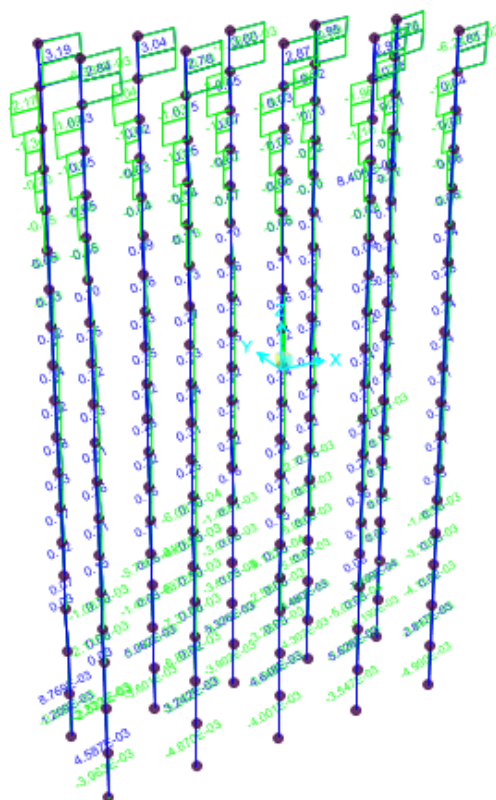


ILUSTRACIÓN 6 DIAGRAMA DE CORTANTE 2-2 (TON)

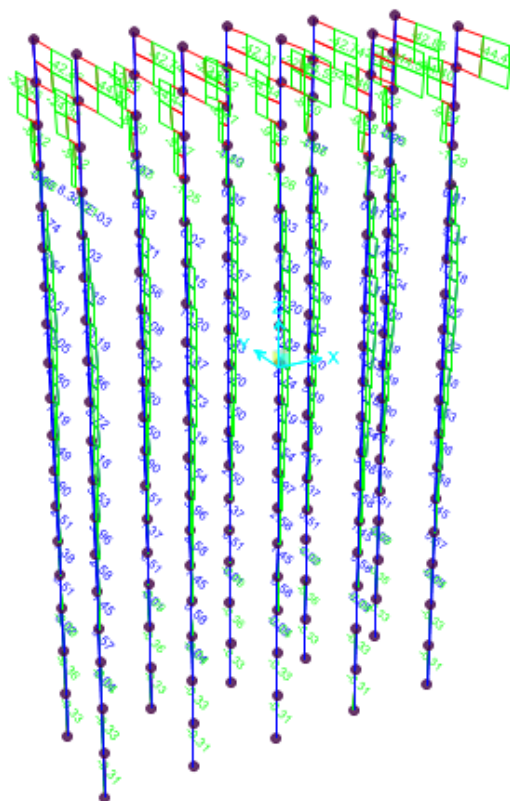


ILUSTRACIÓN 7 DIAGRAMA DE CORTANTE 3-3 (TON)

$$vu = \frac{V_u}{b_v d_v}$$

Donde

b_v = ancho efectivo. Para secciones circulares se puede tomar como el diámetro de la sección.

$$f'_c = 21 \text{ Mpa}$$

$$\phi = 0.9 \text{ -}$$

CORTANTE DEL CONCRETO

$$vc = 0.083 \beta \sqrt{f'_c}, \text{ donde } \beta \text{ es } 2.0.$$

$$vc = 0.76$$

$$\phi vc = 0.68$$

CORTANTE DEL PILOTE

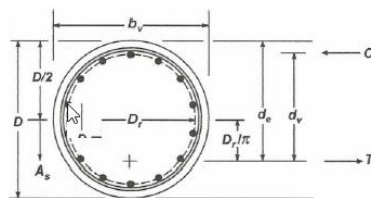


Figura C5.8.2.9-2-1 — Ilustración de los términos d_v , b_v , y d_e para Secciones Circulares

$$b_v \text{ (m)} = 0.7$$

$$\text{Barra fleje} = 4$$

$$\begin{aligned} \text{Número de} \\ \text{paquetes barras} \\ \text{a flexión} &= 1 \end{aligned}$$

$$\text{Barra 1er paquete} = 8$$

$$\text{Barra 2er paquete}$$

$$\text{Barra 3er paquete}$$

$$Rl \text{ (m)} = 0.075$$

$$Vu \text{ (Ton)} = 44.53$$

$$Vu \text{ (N)} = 436690$$

$$vu = \frac{V_u}{b_v d_v} \longrightarrow vu = 0.4445 \longrightarrow vu - \phi vc = -0.24$$

No necesita Refuerzo

Donde;

$$\#ramas = 1 \text{ -}$$

$$\#Barra = 4$$

$$d_e = \frac{D}{2} + \frac{D_r}{\pi}$$

D = diámetro del miembro circular (mm)
 D_r = diámetro del círculo que pasa a través de los centros del refuerzo longitudinal (mm)

$$S = - \text{ mm}$$

$$de = \frac{700}{2} + \frac{3799}{\pi}$$

$$de = 1559.3 \text{ mm}$$

$$d_v = 0.9 d_e$$

$$dv = 1403.3 \text{ mm}$$

El refuerzo a cortante en esta zona de mayor sollicitación se encuentra espaciado cada 75 mm con lo cual resiste el cortante último.

A continuación se presentan la comparación entre el máximo cortante último de ambas direcciones de los pilotes y el cortante admisible:

CUANTIA VOLUMETRICA

Materiales: $f_c = 210 \text{ k/cm}^2$ $f_y = 4200 \text{ k/cm}^2$

Sección : $\varnothing = 0.80 \text{ m}$ **Recubrimiento libre =** 0.07 m

$\varnothing \text{ nucleo} = 0.66 \text{ m}$

$A_g = \text{area bruta de la sección} = \pi \times 80^2 / 4 = 5027 \text{ cm}^2$

$A_c = \text{area núcleo de la sección} = \pi \times 66^2 / 4 = 3421 \text{ cm}^2$

Espaciamiento libre de estribos - a máx = 7.5 cm

Cuantías : $\rho_1 = .45 \times (A_g / A_c - 1) \times f_c / f_y = 0.0106$ $\rho \text{ diseño} = 0.0106$
 $\rho_2 = .12 \times f_c / f_y = 0.0060$

$\varnothing \text{ varilla } (1/8 \text{ "}) = 4$ **S vertical estribos** $\text{teórica} = 8.8 \text{ cm}$
 $\text{definitiva} = 7.0$

$A_{var \text{ requerida}} = \rho_{\text{diseño}} \times \Phi_{\text{núcleo}} \times S_{ver} / 4 = 1.2194 \text{ cm}^2$

$\rho \text{ colocada} = 4 \times A_{varcol} / S_{verest} / \varnothing \text{ núcleo} = 0.011$ **V . B**

ANEXO 1: Solicitaciones máximas para pilotes estribos

TABLE: Element Forces - Frames										
Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	T	M2	M3
Text	m	Text	Text	Text	Tonf	Tonf	Tonf	Tonf-m	Tonf-m	Tonf-m
1	0	gr1	Combination		-48.7497	-0.1649	-14.0255	-1.711E-16	14.92505	-0.31911
1	0.5	gr1	Combination		-49.3536	-0.1649	-14.0255	-1.711E-16	21.9378	-0.23664
1	1	gr1	Combination		-49.9575	-0.1649	-14.0255	-1.711E-16	28.95056	-0.15417
1	0	gr1u	Combination		-54.3667	-0.261	-22.957	-2.899E-16	35.07338	-0.56344
1	0.5	gr1u	Combination		-55.1518	-0.261	-22.957	-2.899E-16	46.55187	-0.43295
1	1	gr1u	Combination		-55.9368	-0.261	-22.957	-2.899E-16	58.03035	-0.30246
1	0	gr7L	Combination		-53.9342	-0.584	-12.0746	-2.107E-16	10.32771	-0.71053
1	0.5	gr7L	Combination		-54.5381	-0.584	-12.0746	-2.107E-16	16.36503	-0.41853
1	1	gr7L	Combination		-55.142	-0.584	-12.0746	-2.107E-16	22.40234	-0.12652
1	0	GRU7L	Combination		-54.7479	-0.7545	-11.6218	-2.266E-16	9.57885	-0.87556
1	0.5	GRU7L	Combination		-55.3518	-0.7545	-11.6218	-2.266E-16	15.38973	-0.4983
1	1	GRU7L	Combination		-55.9557	-0.7545	-11.6218	-2.266E-16	21.20062	-0.12103
1	0	GR7T	Combination		-49.831	-1.5917	-12.7335	-3.296E-16	11.8662	-1.71802
1	0.5	GR7T	Combination		-50.4349	-1.5917	-12.7335	-3.296E-16	18.23293	-0.92215
1	1	GR7T	Combination		-51.0388	-1.5917	-12.7335	-3.296E-16	24.59967	-0.12629
1	0	GRU7T	Combination		-49.0012	-2.1659	-12.5445	-3.931E-16	11.73358	-2.28661
1	0.5	GRU7T	Combination		-49.6051	-2.1659	-12.5445	-3.931E-16	18.00584	-1.20366
1	1	GRU7T	Combination		-50.209	-2.1659	-12.5445	-3.931E-16	24.2781	-0.1207
1	0	ENV	Combination	Max	-48.7497	-0.1649	-11.6218	-1.711E-16	35.07338	-0.31911
1	0.5	ENV	Combination	Max	-49.3536	-0.1649	-11.6218	-1.711E-16	46.55187	-0.23664
1	1	ENV	Combination	Max	-49.9575	-0.1649	-11.6218	-1.711E-16	58.03035	-0.1207
1	0	ENV	Combination	Min	-54.7479	-2.1659	-22.957	-3.931E-16	9.57885	-2.28661
1	0.5	ENV	Combination	Min	-55.3518	-2.1659	-22.957	-3.931E-16	15.38973	-1.20366
1	1	ENV	Combination	Min	-55.9557	-2.1659	-22.957	-3.931E-16	21.20062	-0.30246
44	0	gr1	Combination		-53.9213	0.1451	3.0857	4.434E-17	35.15266	0.36465
44	0.5	gr1	Combination		-54.5252	0.1451	3.0857	4.434E-17	33.60982	0.29208
44	1	gr1	Combination		-55.1291	0.1451	3.0857	4.434E-17	32.06699	0.21951
44	0	gr1u	Combination		-61.0896	0.2099	6.7386	7.42E-17	65.6767	0.50878
44	0.5	gr1u	Combination		-61.8747	0.2099	6.7386	7.42E-17	62.30738	0.40385
44	1	gr1u	Combination		-62.6597	0.2099	6.7386	7.42E-17	58.93806	0.29892
44	0	gr7L	Combination		-60.8736	0.0944	2.237	-2.23E-18	28.3668	0.75917
44	0.5	gr7L	Combination		-61.4775	0.0944	2.237	-2.23E-18	27.24829	0.71195
44	1	gr7L	Combination		-62.0813	0.0944	2.237	-2.23E-18	26.12979	0.66473
44	0	GRU7L	Combination		-62.3954	0.0753	2.0872	-1.811E-17	27.04031	0.91899
44	0.5	GRU7L	Combination		-62.9993	0.0753	2.0872	-1.811E-17	25.99672	0.88134
44	1	GRU7L	Combination		-63.6032	0.0753	2.0872	-1.811E-17	24.95313	0.84369
44	0	GR7T	Combination		-60.8953	-0.0105	2.4692	-1.211E-16	30.73377	1.70104
44	0.5	GR7T	Combination		-61.4992	-0.0105	2.4692	-1.211E-16	29.49916	1.70628
44	1	GR7T	Combination		-62.103	-0.0105	2.4692	-1.211E-16	28.26456	1.71151
44	0	GRU7T	Combination		-62.4258	-0.0716	2.4124	-1.846E-16	30.3554	2.23814

44	0.5	GRU7T	Combination		-63.0297	-0.0716	2.4124	-1.846E-16	29.1492	2.27396
44	1	GRU7T	Combination		-63.6336	-0.0716	2.4124	-1.846E-16	27.943	2.30977
44	0	ENV	Combination	Max	-53.9213	0.2099	6.7386	7.42E-17	65.6767	2.23814
44	0.5	ENV	Combination	Max	-54.5252	0.2099	6.7386	7.42E-17	62.30738	2.27396
44	1	ENV	Combination	Max	-55.1291	0.2099	6.7386	7.42E-17	58.93806	2.30977
44	0	ENV	Combination	Min	-62.4258	-0.0716	2.0872	-1.846E-16	27.04031	0.36465
44	0.5	ENV	Combination	Min	-63.0297	-0.0716	2.0872	-1.846E-16	25.99672	0.29208
44	1	ENV	Combination	Min	-63.6336	-0.0716	2.0872	-1.846E-16	24.95313	0.21951
63	0	gr1	Combination		-118.4769	0.0069	3.1002	-2.776E-16	7.7139	0.00552
63	0.5	gr1	Combination		-119.0808	0.0069	3.1002	-2.776E-16	6.16381	0.00208
63	1	gr1	Combination		-119.6847	0.0069	3.1002	-2.776E-16	4.61371	-0.00136
63	0	gr1u	Combination		-181.0869	0.0075	5.5281	-4.663E-16	13.1802	0.0005
63	0.5	gr1u	Combination		-181.872	0.0075	5.5281	-4.663E-16	10.41614	-0.00325
63	1	gr1u	Combination		-182.657	0.0075	5.5281	-4.663E-16	7.65209	-0.00699
63	0	gr7L	Combination		-111.5314	0.0615	2.5632	-3.033E-16	6.52883	0.18076
63	0.5	gr7L	Combination		-112.1353	0.0615	2.5632	-3.033E-16	5.24724	0.15
63	1	gr7L	Combination		-112.7392	0.0615	2.5632	-3.033E-16	3.96566	0.11924
63	0	GRU7L	Combination		-110.0124	0.0833	2.4521	-3.192E-16	6.271	0.25046
63	0.5	GRU7L	Combination		-110.6163	0.0833	2.4521	-3.192E-16	5.04493	0.20879
63	1	GRU7L	Combination		-111.2202	0.0833	2.4521	-3.192E-16	3.81886	0.16713
63	0	GR7T	Combination		-111.5267	0.1881	2.7435	-4.222E-16	6.9236	0.58416
63	0.5	GR7T	Combination		-112.1305	0.1881	2.7435	-4.222E-16	5.55184	0.49013
63	1	GR7T	Combination		-112.7344	0.1881	2.7435	-4.222E-16	4.18009	0.3961
63	0	GRU7T	Combination		-110.0058	0.2605	2.7047	-4.857E-16	6.8239	0.81544
63	0.5	GRU7T	Combination		-110.6097	0.2605	2.7047	-4.857E-16	5.47154	0.68517
63	1	GRU7T	Combination		-111.2136	0.2605	2.7047	-4.857E-16	4.11919	0.5549
63	0	ENV	Combination	Max	-110.0058	0.2605	5.5281	-2.776E-16	13.1802	0.81544
63	0.5	ENV	Combination	Max	-110.6097	0.2605	5.5281	-2.776E-16	10.41614	0.68517
63	1	ENV	Combination	Max	-111.2136	0.2605	5.5281	-2.776E-16	7.65209	0.5549
63	0	ENV	Combination	Min	-181.0869	0.0069	2.4521	-4.857E-16	6.271	0.0005
63	0.5	ENV	Combination	Min	-181.872	0.0069	2.4521	-4.857E-16	5.04493	-0.00325
63	1	ENV	Combination	Min	-182.657	0.0069	2.4521	-4.857E-16	3.81886	-0.00699
83	0	gr1	Combination		-49.3175	-0.0055	-25.1053	-3.476E-18	-15.36372	0.34283
83	0.5	gr1	Combination		-48.7136	-0.0055	-25.1053	-3.476E-18	-2.81107	0.34559
83	1	gr1	Combination		-48.1097	-0.0055	-25.1053	-3.476E-18	9.74158	0.34836
83	0	gr1u	Combination		-55.0358	-0.0072	-42.7141	-4.525E-18	-35.82235	0.44565
83	0.5	gr1u	Combination		-54.2508	-0.0072	-42.7141	-4.525E-18	-14.46531	0.44924
83	1	gr1u	Combination		-53.4657	-0.0072	-42.7141	-4.525E-18	6.89173	0.45283
83	0	gr7L	Combination		-55.406	0.6391	-21.2845	-3.476E-18	-10.64571	-0.10535
83	0.5	gr7L	Combination		-54.8021	0.6391	-21.2845	-3.476E-18	-0.00348	-0.42489
83	1	gr7L	Combination		-54.1983	0.6391	-21.2845	-3.476E-18	10.63876	-0.74443
83	0	GRU7L	Combination		-56.5774	0.8973	-20.4559	-3.476E-18	-9.85892	-0.28487
83	0.5	GRU7L	Combination		-55.9735	0.8973	-20.4559	-3.476E-18	0.36901	-0.73351
83	1	GRU7L	Combination		-55.3696	0.8973	-20.4559	-3.476E-18	10.59694	-1.18215
83	0	GR7T	Combination		-53.359	2.1432	-22.7325	-3.476E-18	-12.02068	-1.1511

83	0.5	GR7T	Combination		-52.7551	2.1432	-22.7325	-3.476E-18	-0.65442	-2.22268
83	1	GR7T	Combination		-52.1512	2.1432	-22.7325	-3.476E-18	10.71183	-3.29426
83	0	GRU7T	Combination		-53.7104	3.0038	-22.4839	-3.476E-18	-11.78464	-1.7495
83	0.5	GRU7T	Combination		-53.1065	3.0038	-22.4839	-3.476E-18	-0.54268	-3.25143
83	1	GRU7T	Combination		-52.5026	3.0038	-22.4839	-3.476E-18	10.69929	-4.75335
83	0	ENV	Combination	Max	-49.3175	3.0038	-20.4559	-3.476E-18	-9.85892	0.44565
83	0.5	ENV	Combination	Max	-48.7136	3.0038	-20.4559	-3.476E-18	0.36901	0.44924
83	1	ENV	Combination	Max	-48.1097	3.0038	-20.4559	-3.476E-18	10.71183	0.45283
83	0	ENV	Combination	Min	-56.5774	-0.0072	-42.7141	-4.525E-18	-35.82235	-1.7495
83	0.5	ENV	Combination	Min	-55.9735	-0.0072	-42.7141	-4.525E-18	-14.46531	-3.25143
83	1	ENV	Combination	Min	-55.3696	-0.0072	-42.7141	-4.525E-18	6.89173	-4.75335
107	0	gr1	Combination		-48.7497	0.2207	-25.1895	-2.188E-16	-14.92505	-0.31911
107	0.5	gr1	Combination		-48.1459	0.2207	-25.1895	-2.188E-16	-2.33031	-0.42944
107	1	gr1	Combination		-47.542	0.2207	-25.1895	-2.188E-16	10.26443	-0.53977
107	0	gr1u	Combination		-54.3667	0.3402	-42.8566	-3.686E-16	-35.07338	-0.56344
107	0.5	gr1u	Combination		-53.5817	0.3402	-42.8566	-3.686E-16	-13.64509	-0.73353
107	1	gr1u	Combination		-52.7966	0.3402	-42.8566	-3.686E-16	7.78321	-0.90362
107	0	gr7L	Combination		-53.9342	0.8453	-21.3005	-2.445E-16	-10.32771	-0.71053
107	0.5	gr7L	Combination		-53.3303	0.8453	-21.3005	-2.445E-16	0.32253	-1.1332
107	1	gr7L	Combination		-52.7264	0.8453	-21.3005	-2.445E-16	10.97277	-1.55587
107	0	GRU7L	Combination		-54.7479	1.0987	-20.4464	-2.604E-16	-9.57885	-0.87556
107	0.5	GRU7L	Combination		-54.144	1.0987	-20.4464	-2.604E-16	0.64434	-1.42489
107	1	GRU7L	Combination		-53.5401	1.0987	-20.4464	-2.604E-16	10.86753	-1.97422
107	0	GR7T	Combination		-49.831	2.3374	-22.6117	-3.635E-16	-11.8662	-1.71802
107	0.5	GR7T	Combination		-49.2272	2.3374	-22.6117	-3.635E-16	-0.56035	-2.88671
107	1	GR7T	Combination		-48.6233	2.3374	-22.6117	-3.635E-16	10.7455	-4.05541
107	0	GRU7T	Combination		-49.0012	3.1883	-22.2828	-4.27E-16	-11.73358	-2.28661
107	0.5	GRU7T	Combination		-48.3973	3.1883	-22.2828	-4.27E-16	-0.59218	-3.88079
107	1	GRU7T	Combination		-47.7934	3.1883	-22.2828	-4.27E-16	10.54923	-5.47496
107	0	ENV	Combination	Max	-48.7497	3.1883	-20.4464	-2.188E-16	-9.57885	-0.31911
107	0.5	ENV	Combination	Max	-48.1459	3.1883	-20.4464	-2.188E-16	0.64434	-0.42944
107	1	ENV	Combination	Max	-47.542	3.1883	-20.4464	-2.188E-16	10.97277	-0.53977
107	0	ENV	Combination	Min	-54.7479	0.2207	-42.8566	-4.27E-16	-35.07338	-2.28661
107	0.5	ENV	Combination	Min	-54.144	0.2207	-42.8566	-4.27E-16	-13.64509	-3.88079
107	1	ENV	Combination	Min	-53.5401	0.2207	-42.8566	-4.27E-16	7.78321	-5.47496
155	0	gr1	Combination		-108.8015	0.0863	-26.2177	3.469E-18	-11.78578	0.11144
155	0.5	gr1	Combination		-108.1976	0.0863	-26.2177	3.469E-18	1.32309	0.06828
155	1	gr1	Combination		-107.5937	0.0863	-26.2177	3.469E-18	14.43196	0.02513
155	0	gr1u	Combination		-168.5562	0.1467	-44.5286	4.51E-18	-29.98347	0.05671
155	0.5	gr1u	Combination		-167.7712	0.1467	-44.5286	4.51E-18	-7.71914	-0.01663
155	1	gr1u	Combination		-166.9861	0.1467	-44.5286	4.51E-18	14.54518	-0.08997
155	0	gr7L	Combination		-103.1521	0.6892	-22.3649	3.469E-18	-7.23219	-0.27241
155	0.5	gr7L	Combination		-102.5482	0.6892	-22.3649	3.469E-18	3.95024	-0.617
155	1	gr7L	Combination		-101.9443	0.6892	-22.3649	3.469E-18	15.13268	-0.9616
155	0	GRU7L	Combination		-102.1553	0.9327	-21.5388	3.469E-18	-6.46095	-0.43124

155	0.5	GRU7L	Combination		-101.5514	0.9327	-21.5388	3.469E-18	4.30846	-0.89757
155	1	GRU7L	Combination		-100.9475	0.9327	-21.5388	3.469E-18	15.07788	-1.3639
155	0	GR7T	Combination		-106.2076	2.118	-23.9137	3.469E-18	-8.41909	-1.22624
155	0.5	GR7T	Combination		-105.6038	2.118	-23.9137	3.469E-18	3.53777	-2.28524
155	1	GR7T	Combination		-104.9999	2.118	-23.9137	3.469E-18	15.49462	-3.34424
155	0	GRU7T	Combination		-106.4348	2.9338	-23.7081	3.469E-18	-8.12328	-1.76715
155	0.5	GRU7T	Combination		-105.8309	2.9338	-23.7081	3.469E-18	3.73076	-3.23404
155	1	GRU7T	Combination		-105.227	2.9338	-23.7081	3.469E-18	15.58481	-4.70094
155	0	ENV	Combination	Max	-102.1553	2.9338	-21.5388	4.51E-18	-6.46095	0.11144
155	0.5	ENV	Combination	Max	-101.5514	2.9338	-21.5388	4.51E-18	4.30846	0.06828
155	1	ENV	Combination	Max	-100.9475	2.9338	-21.5388	4.51E-18	15.58481	0.02513
155	0	ENV	Combination	Min	-168.5562	0.0863	-44.5286	3.469E-18	-29.98347	-1.76715
155	0.5	ENV	Combination	Min	-167.7712	0.0863	-44.5286	3.469E-18	-7.71914	-3.23404
155	1	ENV	Combination	Min	-166.9861	0.0863	-44.5286	3.469E-18	14.43196	-4.70094

7. DISEÑO MURO DE CONTENCIÓN

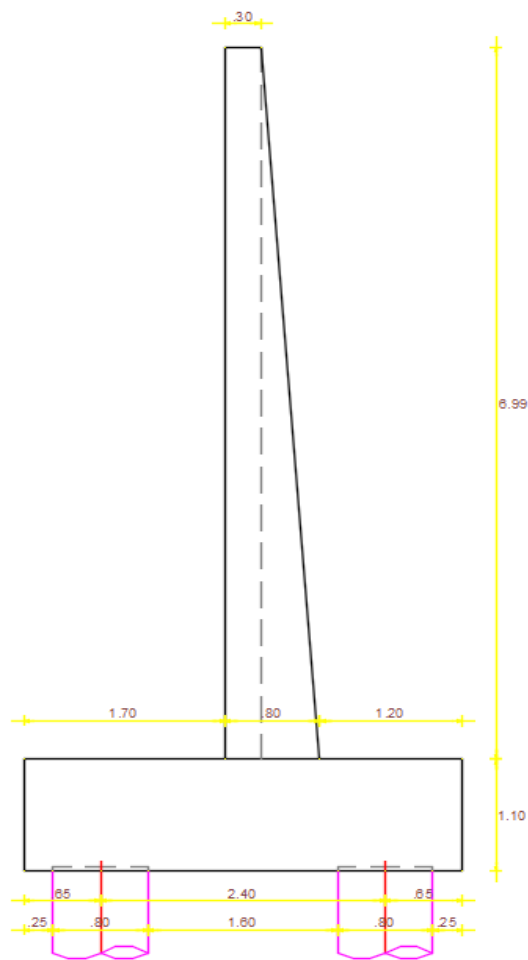
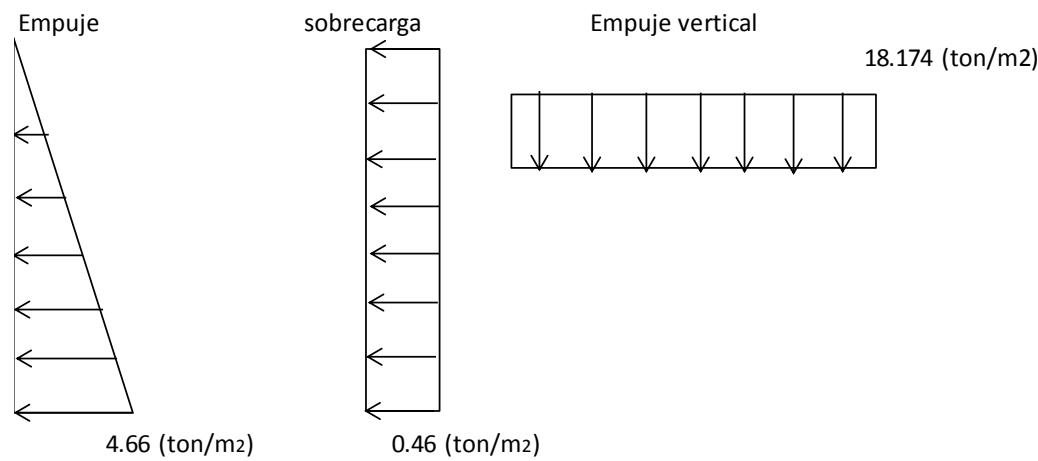


ILUSTRACIÓN 8 MURO DE CONTENCIÓN

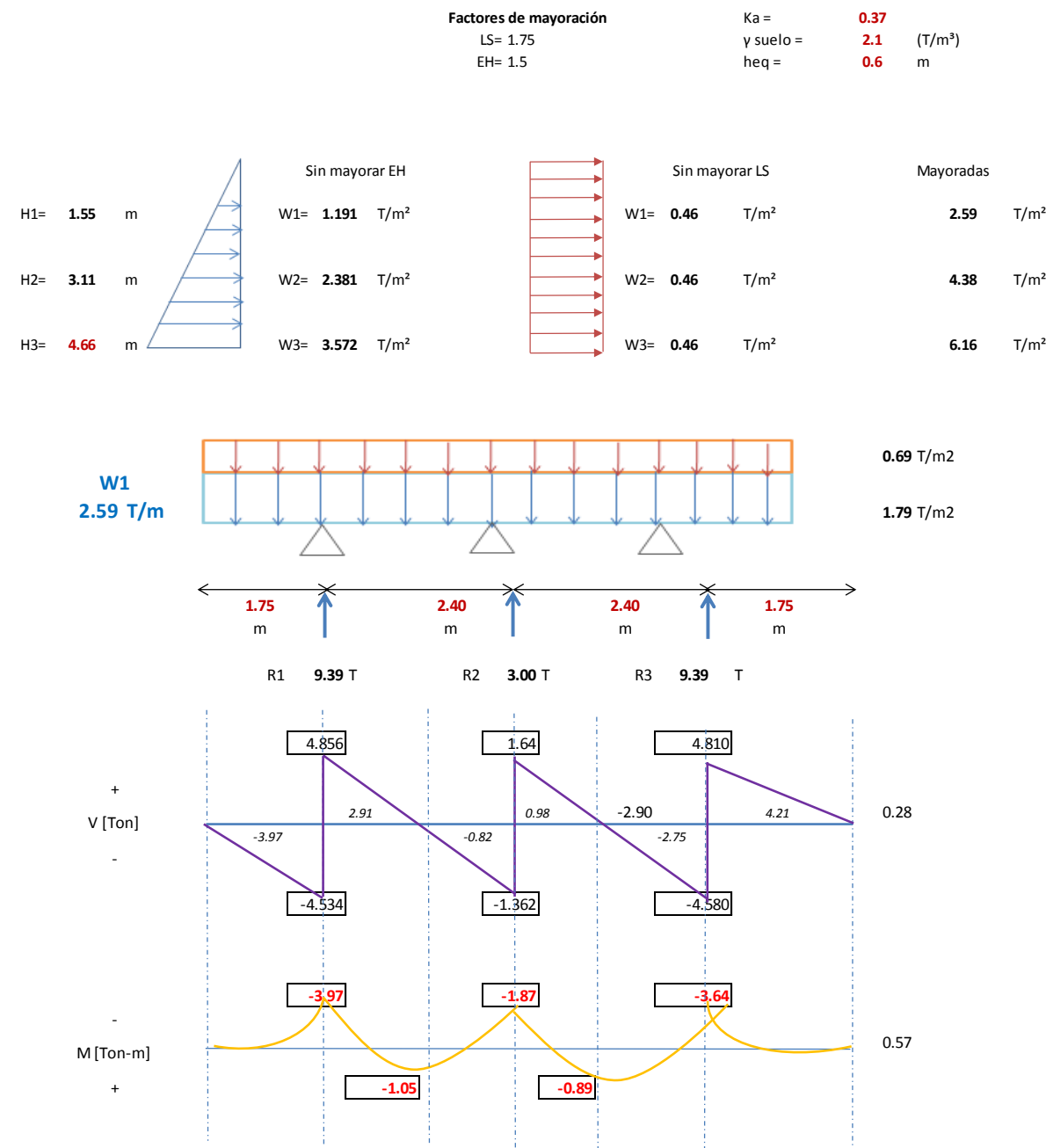


7.1. Pantalla

Para el diseño del refuerzo horizontal de la pantalla del muro, se toman valores de empujes en tres franjas horizontales del elemento para el diseño a flexión conforme a la magnitud de los mismos,

Empuje horizontal $E_H = K_a \gamma H$, donde K_a es el coeficiente de presión activa, γ el peso específico del material granular del relleno y H la altura de la pantalla en cada una de las franjas de diseño (inferior, intermedia y superior).

Como se requiere analizar la flexión horizontal de la pantalla, el valor de empuje se toma como carga distribuida sobre una viga horizontal continua.



M max= 3.97 Ton-m

DISEÑO FLEXIÓN PARTE SUPERIOR DE LA PANTALLA

b=	100	cm	f _y =	4200	kg/cm ²
H=	30	cm	f _c =	280	kg/cm ²
d'=	7.0	cm	φ=	0.9	

Mu = 3.97 Ton-m **Magr= 5.96** Ton-m

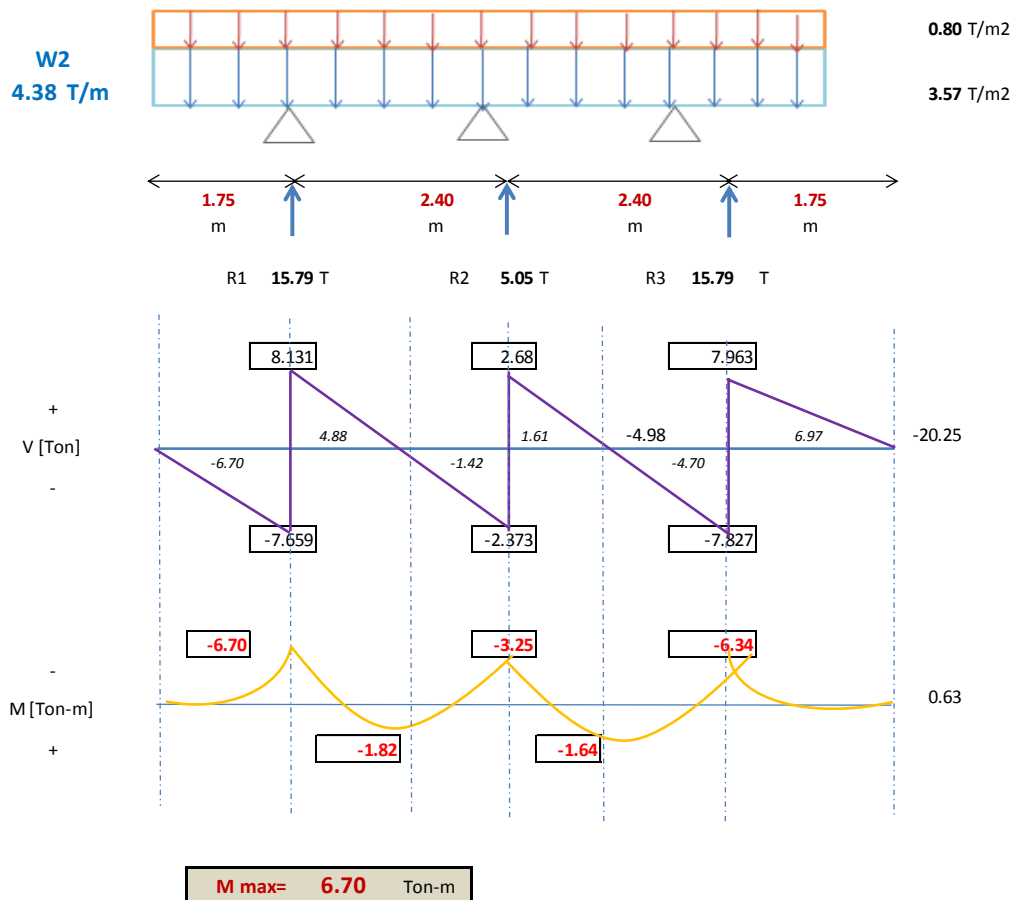
$\rho = 0.00201994$ $\rho_{agr} = 0.00306533$

As= 4.65 cm² **As agr= 7.05** cm²

$1,33\rho = 0.00268652$

As 1,33= 6.18 cm² **As Diseño= 6.18** cm²

#Barra	Área (cm ²)	Ref Cada (m)
5	1.99	0.322



DISEÑO FLEXIÓN PARTE INTERMEDIA DE LA PANTALLA

b= 100 cm **fy=** 4200 kg/cm²
H= 30 cm **f'c=** 280 kg/cm²
d'= 7.0 cm **φ=** 0.9

Mu = 6.70 Ton-m **Magr=** 5.96 Ton-m

ρ = 0.00345701 **ρ agr =** 0.00306533

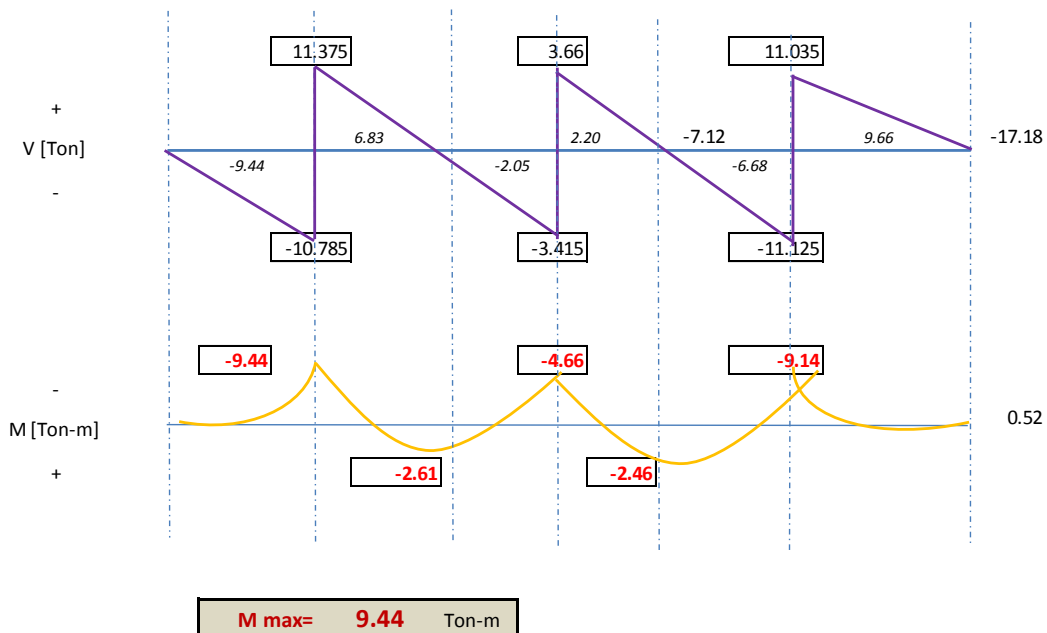
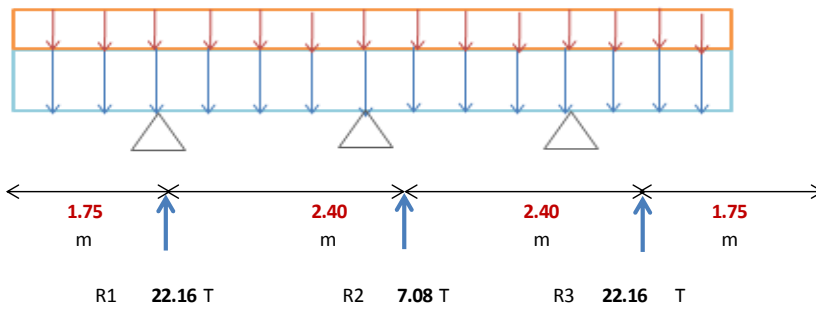
As= 7.95 cm² **As agr=** 7.05 cm²

1,33ρ = 0.00459782

As 1,33= 10.57 cm² **As Diseño=** 7.95 cm²

#Barra **Área (cm²)** **Ref Cada (m)**
 5 1.99 0.250

W3
6.16 T/m



DISEÑO FLEXIÓN PARTE INFERIOR DE LA PANTALLA

b=	100	cm	f _y =	4200	kg/cm ²
H=	30	cm	f' _c =	280	kg/cm ²
d'=	7.0	cm	φ=	0.9	

Mu = 9.44 Ton-m **Magr**= 5.96 Ton-m

ρ = 0.00493399 **ρ agr** = 0.00306533

As= 11.35 cm² **As agr**= 7.05 cm²

1,33ρ = 0.0065622

As 1,33= 15.09 cm² **As Diseño**= 11.35 cm²

#Barra	Área (cm ²)	Ref Cada (m)
5	1.99	0.175

7.2. Contrafuerte

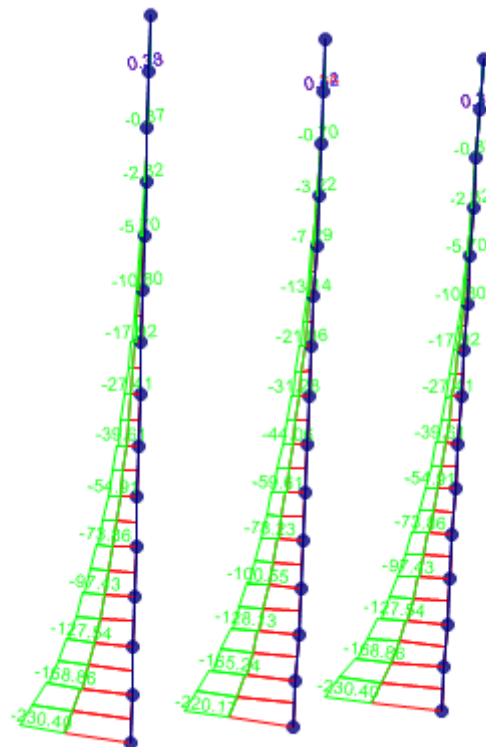


ILUSTRACIÓN 9 DIAGRAMA DE MOMENTOS CONTRAFUERTE

DISEÑO FLEXIÓN

b= 70 cm	f_y= 4200 kg/cm ²
H= 110 cm	f'c= 280 kg/cm ²
d'= 7.0 cm	φ= 0.9

Mu = 230.50 Ton-m **Magr=** 56.13 Ton-m

ρ = 0.008912 **ρ agr =** 0.00203594

As= 64.26 cm² **As agr=** 14.68 cm²

1,33ρ = 0.01185296

As 1,33= 85.46 cm² **As Diseño=** 64.26 cm²

#Barra	Área (cm²)	Cantidad Ref
8	5.1	12.60

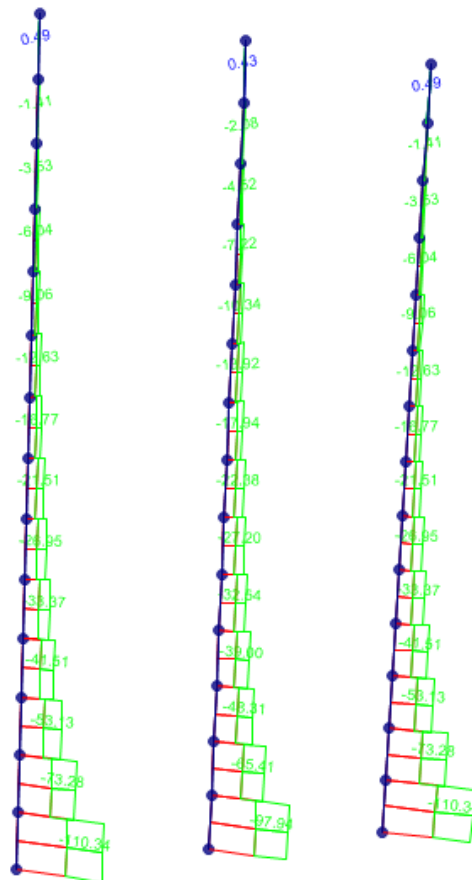


ILUSTRACIÓN 10 DIAGRAMA DE CORTANTE CONTRAFUERTE

b=	70	cm	fy=	4200	kg/cm ²
H=	110	cm	f'c=	280	kg/cm ²
d'=	7.0	cm	φ=	0.9	

#ramas	2	-
#Barra	4	

Vu =	111	Ton	φ vc=	7.98	kg/cm ²
vu =	15.395	kg/cm ²			

S=	18.501	cm	Necesita Refuerzo a cortante
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7.3. Dado

Diseño a flexión

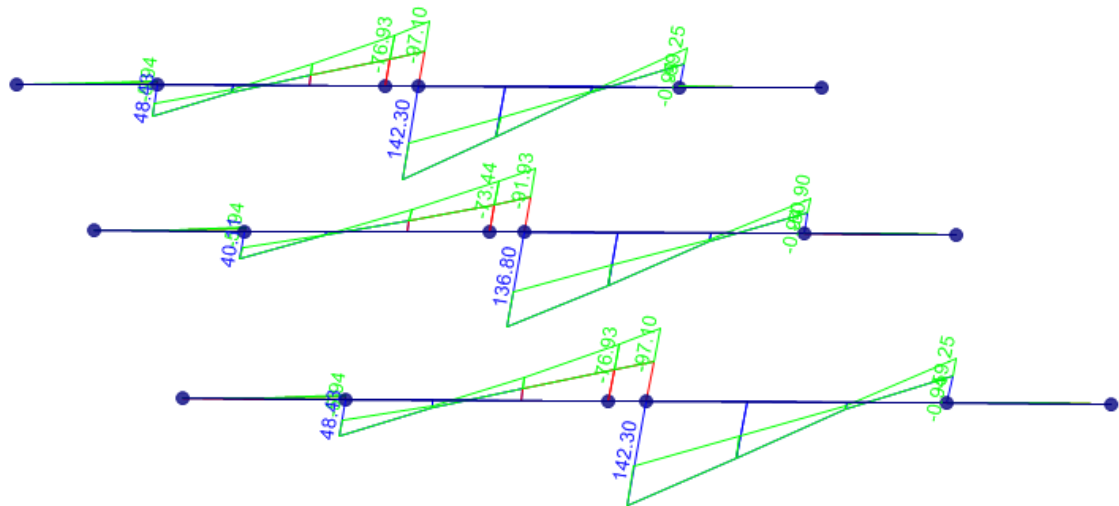


ILUSTRACIÓN 11 DIAGRAMA DE MOMENTOS DADO

- Refuerzo superior

DISEÑO FLEXIÓN

b=	130	cm	fy=	4200	kg/cm ²
H=	110	cm	f'c=	280	kg/cm ²
d'=	7.0	cm	φ=	0.9	

Mu = 97.10 Ton-m **Magr= 104.23** Ton-m

$\rho = 0.00189422$ $\rho_{agr} = 0.00203594$

As= 25.36 cm² **As agr= 27.26** cm²

$1,33\rho = 0.00251931$

As 1,33= 33.73 cm² **As Diseño= 27.26** cm²

#Barra	Área (cm ²)	Cantidad Ref
6	2.84	9.60

- **Refuerzo inferior**

DISEÑO FLEXIÓN

b= 130	cm	fy= 4200	kg/cm ²
H= 110	cm	f'c= 280	kg/cm ²
d'= 7.0	cm	φ= 0.9	

Mu = 142.30 Ton-m **Magr= 104.23** Ton-m

$\rho = 0.00279869$ $\rho_{agr} = 0.00203594$

As= 37.47 cm² **As agr= 27.26** cm²

$1,33\rho = 0.00372226$

As 1,33= 49.84 cm² **As Diseño= 37.47** cm²

#Barra	Área (cm ²)	Cantidad Ref
8	5.1	7.35

Cortante

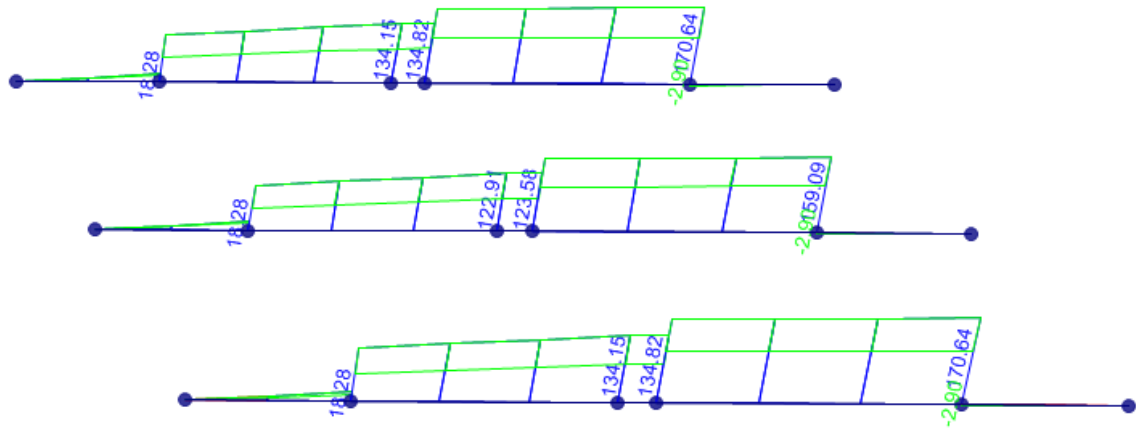


ILUSTRACIÓN 12 DIAGRAMA DE CORTANTE DADO

b=	130	cm	f_y=	4200	kg/cm ²
H=	110	cm	f_c=	280	kg/cm ²
d'=	7.0	cm	φ=	0.9	

-

$$Vu = 170.64 \text{ Ton} \quad \phi \text{ } vc = 7.98 \text{ kg/cm}^2$$

$$vu = 12.744 \text{ kg/cm}^2$$

$$S = 24.301 \text{ cm} \quad \text{Necesita Refuerzo a cortante}$$

7.4. Pilotes muros

Los dados del muro están compuestos por 3 pilotes cada uno de 0.8 m de diámetro y 19 m metros de longitud. A continuación se muestran los módulos de reacción horizontal y vertical utilizados según la información recibida en el informe geotécnico.

MODULOS DE REACCIÓN DE SUBRASANTE HORIZONTAL

Prof		L	Diametro	K (Ton/m)
0	0	1	0.8	0
1	0	1	0.8	0
2	0	1	0.8	0
3	1720	1	0.8	1376
4	1720	1	0.8	1376
5	6650	1	0.8	5320
6	6650	1	0.8	5320
7	6650	1	0.8	5320
8	6650	1	0.8	5320
9	18660	1	0.8	14928
10	18660	1	0.8	14928
11	18660	1	0.8	14928
12	18660	1	0.8	14928
13	18660	1	0.8	14928
14	18660	1	0.8	14928
15	18660	1	0.8	14928
16	18660	1	0.8	14928
17	18660	1	0.8	14928
18	18660	1	0.8	14928
19	18660	1	0.8	14928

TABLA 14 MODULOS DE REACCION HORIZONTAL

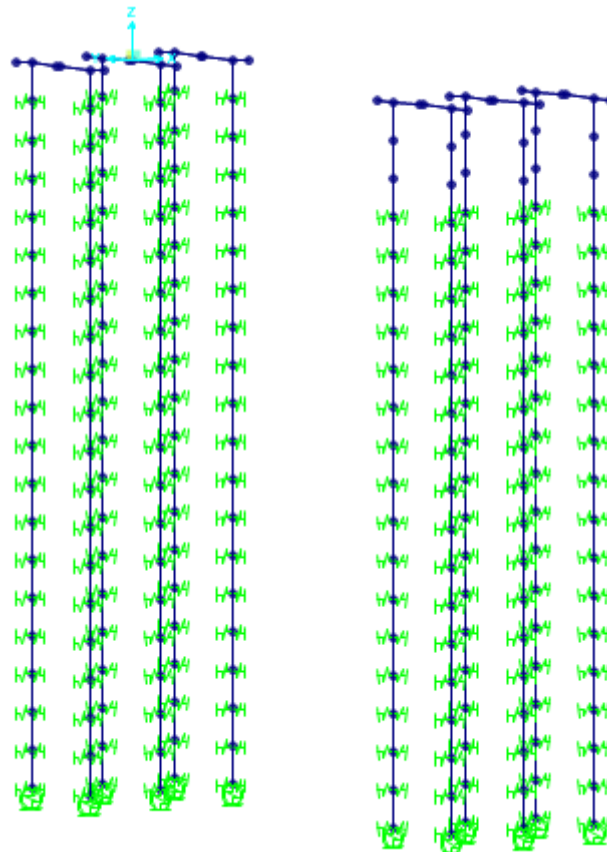


ILUSTRACIÓN 13 MODELO PILOTES EN AMBOS COSTADOS

- Capacidad portante

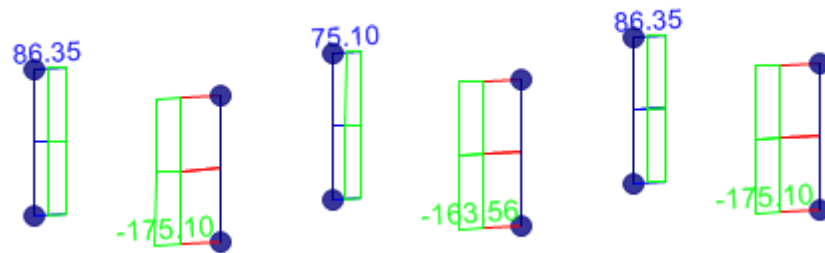


ILUSTRACIÓN 14 FUERZA AXIAL POR CARGA DE DISEÑO EN PILOTES

Muros			
Características del depósito			Capacidad Portante (Ton)
Profundidad (m)	Diámetro (m)	γ_t (Ton/m ³)	
19.0	0.80	2.0	173.54

TABLA 15 VALORES CAPACIDAD PORTANTE POR SERVICIO PILOTES

Diseño flexión

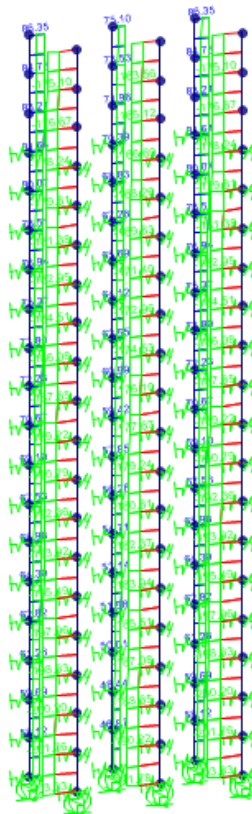


ILUSTRACIÓN 15 DIAGRAMA DE CARGA AXIAL (TON)

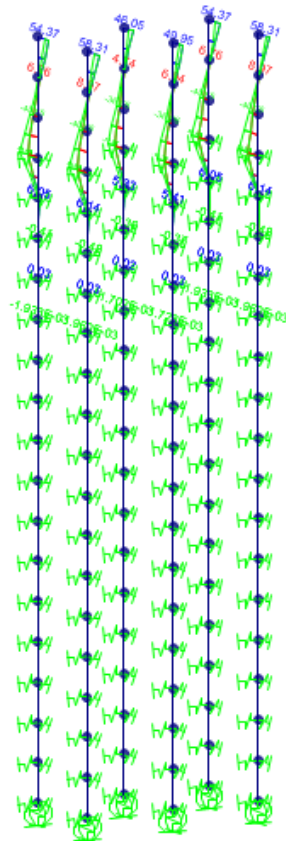


ILUSTRACIÓN 16 DIAGRAMA DE MOMENTOS 2-2 (T-M)

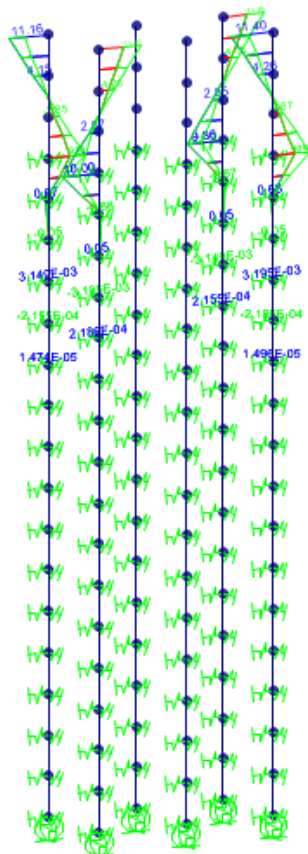


ILUSTRACIÓN 17 DIAGRAMA DE MOMENTOS 3-3 (T-M)

Con el fin de generar los diagramas de interacción por resistencia y por evento extremo se utilizaron los valores consignados en el Anexo 2.

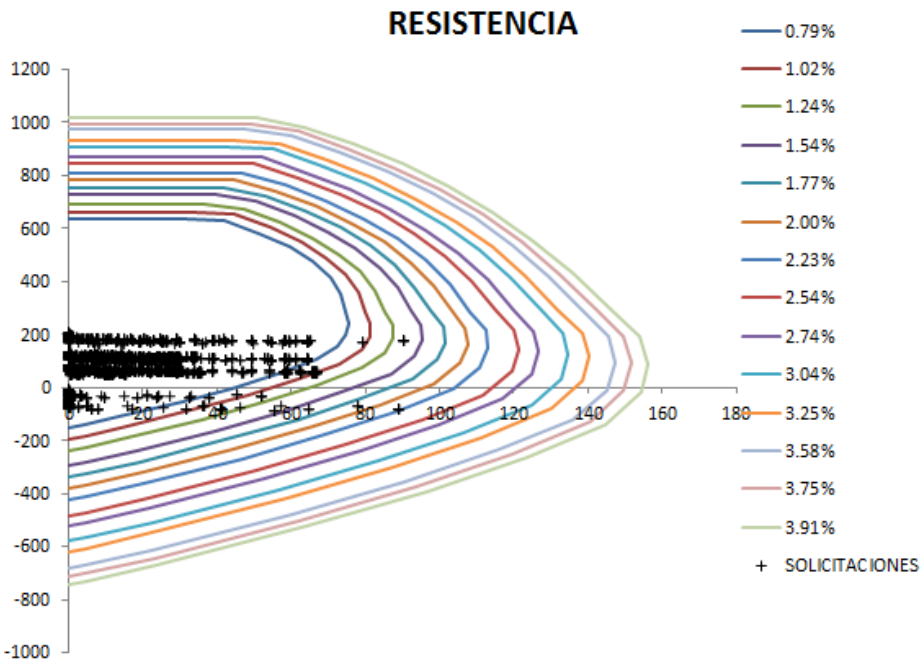


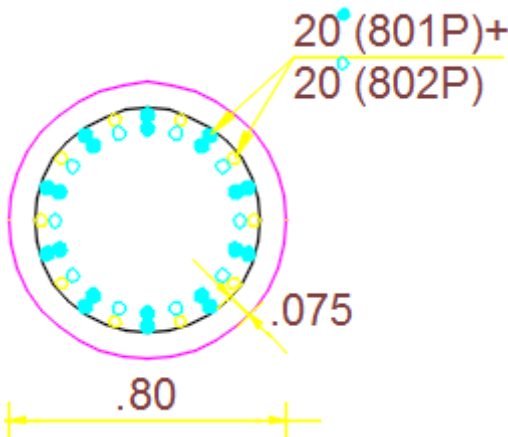
ILUSTRACIÓN 18 DIAGRAMA DE INTERACCIÓN AXIAL Y MOMENTO DE DISEÑO

A partir de las solicitaciones últimas de resistencia y evento extremo en los pilotes establecemos la cuantía de acero necesaria con las solicitaciones más desfavorables, la cual es del 2.23%. Esta cantidad de acero debe sumistrarse de tal manera que cumpla con el As requerido.

Cantidad de Refuerzo Requerida			
Ø	Area	%	AS (cm²)
0.8	0.50	2.23	112.09

Se colocan 20 varillas de 1” dispuestas en dos filas de manera que cumple con el As requerido:

$$40 \times 5.10 \text{ cm}^2 = 204.4 \text{ cm}^2$$



Verificación a cortante en pilotes

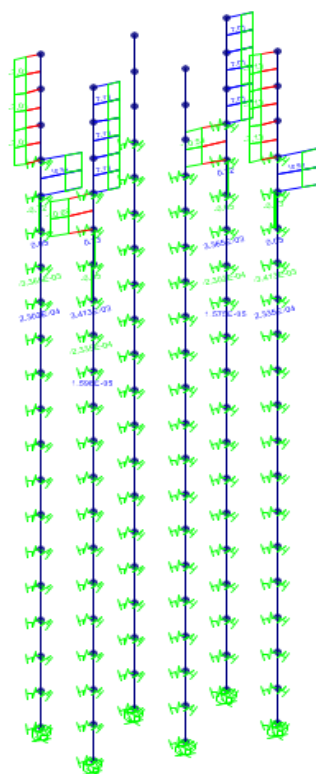


ILUSTRACIÓN 19 DIAGRAMA DE CORTANTE 2-2 (TON)

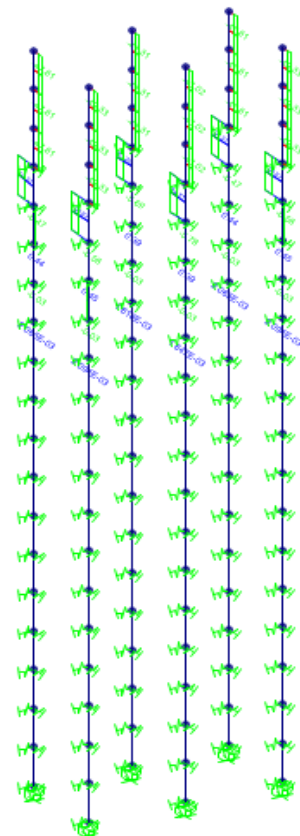


ILUSTRACIÓN 20 DIAGRAMA DE CORTANTE 3-3 (TON)

$$vu = \frac{V_u}{b_v d_v}$$

Donde

b_v = ancho efectivo. Para secciones circulares se puede tomar como el diámetro de la sección.

$$f'_c = 21 \text{ Mpa}$$

$$\phi = 0.9$$

CORTANTE DEL CONCRETO

$$v_c = 0.083 \beta \sqrt{f'_c}, \text{ donde } \beta \text{ es } 2.0.$$

$$v_c = 0.76$$

$$\phi v_c = 0.68$$

CORTANTE DEL PILOTE

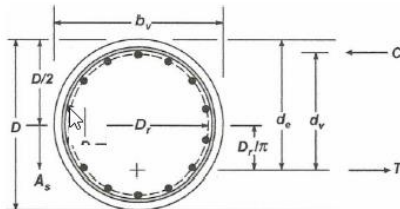


Figura C5.8.2.9-2-1 — Ilustración de los términos d_v , b_v , y d_e para Secciones Circulares

$$b_v \text{ (m)} = 0.7$$

$$\text{Barra fleje} = 4$$

$$\text{Número de paquetes barras a flexión} = 1$$

$$\text{Barra 1er paquete} = 8$$

$$\text{Barra 2er paquete}$$

$$\text{Barra 3er paquete}$$

$$R_l \text{ (m)} = 0.075$$

$$V_u \text{ (Ton)} = 95.83$$

$$V_u \text{ (N)} = 939771$$

$$vu = \frac{V_u}{b_v d_v} \longrightarrow vu = 0.9567 \longrightarrow vu - \phi v_c = 0.27$$

Necesita Refuerzo

Donde;

$$\# \text{ramas} = 1$$

$$\# \text{Barra} = 4$$

$$d_e = \frac{D}{2} + \frac{D_r}{\pi}$$

D = diámetro del miembro circular (mm)
 D_r = diámetro del círculo que pasa a través de los centros del refuerzo longitudinal (mm)

$$S = 252.099 \text{ mm}$$

$$d_e = \frac{700}{2} + \frac{3799}{\pi}$$

$$d_e = 1559.3 \text{ mm}$$

$$d_v = 0.9 d_e$$

$$d_v = 1403.3 \text{ mm}$$

El refuerzo a cortante en esta zona de mayor sollicitación se encuentra espaciado cada 75 mm con lo cual resiste el cortante último.

A continuación se presentan la comparación entre el máximo cortante último de ambas direcciones de los pilotes y el cortante admisible:

CUANTIA VOLUMETRICA

Materiales: $f_c = 210 \text{ k/cm}^2$ $f_y = 4200 \text{ k/cm}^2$

Sección : $\varnothing = 0.80 \text{ m}$ **Recubrimiento libre =** 0.07 m

$\varnothing \text{ nucleo} = 0.66 \text{ m}$

$A_g = \text{area bruta de la sección} = \pi \times 80^2 / 4 = 5027 \text{ cm}^2$

$A_c = \text{area núcleo de la sección} = \pi \times 66^2 / 4 = 3421 \text{ cm}^2$

Espaciamiento libre de estribos - a máx = 7.5 cm

Cuantías : $\rho_1 = .45 \times (A_g / A_c - 1) \times f_c / f_y = 0.0106$ $\rho \text{ diseño} = 0.0106$
 $\rho_2 = .12 \times f_c / f_y = 0.0060$

$\varnothing \text{ varilla } (1/8 \text{ "}) = 4$ **S vertical estribos** $\text{teórica} = 8.8 \text{ cm}$
 $\text{definitiva} = 7.0$

$A_{var \text{ requerida}} = \rho_{\text{diseño}} \times \Phi_{\text{núcleo}} \times S_{ver} / 4 = 1.2194 \text{ cm}^2$

$\rho \text{ colocada} = 4 \times A_{varcol} / S_{verest} / \varnothing \text{ núcleo} = 0.011$ **V . B**

ANEXO 2: Solicitaciones máximas para pilotes muros

TABLE: Element Forces - Frames										
Frame	Station	OutputCase	CaseType	P	V2	V3	T	M2	M3	FrameElem
Text	m	Text	Text	Tonf	Tonf	Tonf	Tonf-m	Tonf-m	Tonf-m	Text
223	0	Grupo 1	Combination	-130.2569	-1.987E-17	-1.765E-16	0	0	0	223-1
223	0.5	Grupo 1	Combination	-129.6537	-1.987E-17	-1.765E-16	0	8.825E-17	9.933E-18	223-1
223	1	Grupo 1	Combination	-129.0505	-1.987E-17	-1.765E-16	0	1.765E-16	1.987E-17	223-1
223	0	Gru1 Ult1.7	Combination	-203.3331	-3.37E-17	-3.022E-16	0	0	0	223-1
223	0.5	Gru1 Ult1.7	Combination	-202.549	-3.37E-17	-3.022E-16	0	1.511E-16	1.685E-17	223-1
223	1	Gru1 Ult1.7	Combination	-201.7648	-3.37E-17	-3.022E-16	0	3.022E-16	3.37E-17	223-1
224	0	Grupo 1	Combination	-129.0505	3.114E-16	2.766E-15	0	1.765E-16	1.987E-17	224-1
224	0.5	Grupo 1	Combination	-128.4473	3.114E-16	2.766E-15	0	-1.207E-15	-1.358E-16	224-1
224	1	Grupo 1	Combination	-127.8441	3.114E-16	2.766E-15	0	-2.59E-15	-2.915E-16	224-1
224	0	Gru1 Ult1.7	Combination	-201.7648	5.282E-16	4.736E-15	0	3.022E-16	3.37E-17	224-1
224	0.5	Gru1 Ult1.7	Combination	-200.9807	5.282E-16	4.736E-15	0	-2.066E-15	-2.304E-16	224-1
224	1	Gru1 Ult1.7	Combination	-200.1965	5.282E-16	4.736E-15	0	-4.434E-15	-4.945E-16	224-1
225	0	Grupo 1	Combination	-127.8441	-4.549E-15	-4.041E-14	2.216E-16	-2.59E-15	-2.915E-16	225-1
225	0.5	Grupo 1	Combination	-127.2409	-4.549E-15	-4.041E-14	2.216E-16	1.762E-14	1.983E-15	225-1
225	1	Grupo 1	Combination	-126.6378	-4.549E-15	-4.041E-14	2.216E-16	3.782E-14	4.257E-15	225-1
225	0	Gru1 Ult1.7	Combination	-200.1965	-7.716E-15	-6.919E-14	3.769E-16	-4.434E-15	-4.945E-16	225-1
225	0.5	Gru1 Ult1.7	Combination	-199.4124	-7.716E-15	-6.919E-14	3.769E-16	3.016E-14	3.364E-15	225-1
225	1	Gru1 Ult1.7	Combination	-198.6283	-7.716E-15	-6.919E-14	3.769E-16	6.475E-14	7.222E-15	225-1
226	0	Grupo 1	Combination	-126.6378	6.643E-14	5.902E-13	1.776E-15	3.782E-14	4.257E-15	226-1
226	0.5	Grupo 1	Combination	-126.0346	6.643E-14	5.902E-13	1.776E-15	-2.573E-13	-2.896E-14	226-1
226	1	Grupo 1	Combination	-125.4314	6.643E-14	5.902E-13	1.776E-15	-5.524E-13	-6.218E-14	226-1
226	0	Gru1 Ult1.7	Combination	-198.6283	1.127E-13	1.01E-12	3.02E-15	6.475E-14	7.222E-15	226-1
226	0.5	Gru1 Ult1.7	Combination	-197.8441	1.127E-13	1.01E-12	3.02E-15	-4.405E-13	-4.912E-14	226-1
226	1	Gru1 Ult1.7	Combination	-197.06	1.127E-13	1.01E-12	3.02E-15	-9.457E-13	-1.055E-13	226-1
227	0	Grupo 1	Combination	-125.4314	-9.702E-13	-8.62E-12	1.776E-15	-5.524E-13	-6.218E-14	227-1
227	0.5	Grupo 1	Combination	-124.8282	-9.702E-13	-8.62E-12	1.776E-15	3.758E-12	4.229E-13	227-1
227	1	Grupo 1	Combination	-124.225	-9.702E-13	-8.62E-12	1.776E-15	8.068E-12	9.08E-13	227-1
227	0	Gru1 Ult1.7	Combination	-197.06	-1.646E-12	-1.476E-11	3.02E-15	-9.457E-13	-1.055E-13	227-1
227	0.5	Gru1 Ult1.7	Combination	-196.2758	-1.646E-12	-1.476E-11	3.02E-15	6.433E-12	7.174E-13	227-1
227	1	Gru1 Ult1.7	Combination	-195.4917	-1.646E-12	-1.476E-11	3.02E-15	1.381E-11	1.54E-12	227-1
228	0	Grupo 1	Combination	-124.225	1.417E-11	1.259E-10	4.437E-16	8.068E-12	9.08E-13	228-1
228	0.5	Grupo 1	Combination	-123.6218	1.417E-11	1.259E-10	4.437E-16	-5.488E-11	-6.177E-12	228-1
228	1	Grupo 1	Combination	-123.0186	1.417E-11	1.259E-10	4.437E-16	-1.178E-10	-1.326E-11	228-1
228	0	Gru1 Ult1.7	Combination	-195.4917	2.404E-11	2.155E-10	7.544E-16	1.381E-11	1.54E-12	228-1
228	0.5	Gru1 Ult1.7	Combination	-194.7075	2.404E-11	2.155E-10	7.544E-16	-9.395E-11	-1.048E-11	228-1
228	1	Gru1 Ult1.7	Combination	-193.9234	2.404E-11	2.155E-10	7.544E-16	-2.017E-10	-2.25E-11	228-1
229	0	Grupo 1	Combination	-123.0186	-2.069E-10	-1.839E-09	-4.437E-16	-1.178E-10	-1.326E-11	229-1
229	0.5	Grupo 1	Combination	-122.4155	-2.069E-10	-1.839E-09	-4.437E-16	8.015E-10	9.021E-11	229-1
229	1	Grupo 1	Combination	-121.8123	-2.069E-10	-1.839E-09	-4.437E-16	1.721E-09	1.937E-10	229-1

229	0	Gru1 Ult1.7	Combination	-193.9234	-3.51E-10	-3.147E-09	-7.544E-16	-2.017E-10	-2.25E-11	229-1
229	0.5	Gru1 Ult1.7	Combination	-193.1393	-3.51E-10	-3.147E-09	-7.544E-16	1.372E-09	1.53E-10	229-1
229	1	Gru1 Ult1.7	Combination	-192.3551	-3.51E-10	-3.147E-09	-7.544E-16	2.946E-09	3.285E-10	229-1
230	0	Grupo 1	Combination	-121.8123	3.022E-09	2.685E-08	-1.776E-15	1.721E-09	1.937E-10	230-1
230	0.5	Grupo 1	Combination	-121.2091	3.022E-09	2.685E-08	-1.776E-15	-1.17E-08	-1.317E-09	230-1
230	1	Grupo 1	Combination	-120.6059	3.022E-09	2.685E-08	-1.776E-15	-2.513E-08	-2.829E-09	230-1
230	0	Gru1 Ult1.7	Combination	-192.3551	5.127E-09	4.597E-08	-3.02E-15	2.946E-09	3.285E-10	230-1
230	0.5	Gru1 Ult1.7	Combination	-191.571	5.127E-09	4.597E-08	-3.02E-15	-2.004E-08	-2.235E-09	230-1
230	1	Gru1 Ult1.7	Combination	-190.7868	5.127E-09	4.597E-08	-3.02E-15	-4.302E-08	-4.798E-09	230-1
231	0	Grupo 1	Combination	-120.6059	-4.414E-08	-3.921E-07	-1.998E-15	-2.513E-08	-2.829E-09	231-1
231	0.5	Grupo 1	Combination	-120.0027	-4.414E-08	-3.921E-07	-1.998E-15	1.709E-07	1.924E-08	231-1
231	1	Grupo 1	Combination	-119.3995	-4.414E-08	-3.921E-07	-1.998E-15	0.000000367	4.131E-08	231-1
231	0	Gru1 Ult1.7	Combination	-190.7868	-7.487E-08	-6.713E-07	-3.397E-15	-4.302E-08	-4.798E-09	231-1
231	0.5	Gru1 Ult1.7	Combination	-190.0027	-7.487E-08	-6.713E-07	-3.397E-15	2.926E-07	3.264E-08	231-1
231	1	Gru1 Ult1.7	Combination	-189.2186	-7.487E-08	-6.713E-07	-3.397E-15	6.283E-07	7.007E-08	231-1
232	0	Grupo 1	Combination	-119.3995	6.446E-07	0.000005727	-2.216E-16	0.000000367	4.131E-08	232-1
232	0.5	Grupo 1	Combination	-118.7963	6.446E-07	0.000005727	-2.216E-16	-0.000002497	-0.000000281	232-1
232	1	Grupo 1	Combination	-118.1932	6.446E-07	0.000005727	-2.216E-16	-0.00000536	-6.033E-07	232-1
232	0	Gru1 Ult1.7	Combination	-189.2186	0.000001093	0.000009804	-3.769E-16	6.283E-07	7.007E-08	232-1
232	0.5	Gru1 Ult1.7	Combination	-188.4344	0.000001093	0.000009804	-3.769E-16	-0.000004274	-4.766E-07	232-1
232	1	Gru1 Ult1.7	Combination	-187.6503	0.000001093	0.000009804	-3.769E-16	-0.000009176	-0.000001023	232-1
233	0	Grupo 1	Combination	-118.1932	-0.00000942	-0.00008369	1.998E-15	-0.00000536	-6.033E-07	233-1
233	0.5	Grupo 1	Combination	-117.59	-0.00000942	-0.00008369	1.998E-15	0.00003649	0.000004107	233-1
233	1	Grupo 1	Combination	-116.9868	-0.00000942	-0.00008369	1.998E-15	0.00007833	0.000008817	233-1
233	0	Gru1 Ult1.7	Combination	-187.6503	-0.00001598	-0.0001433	3.397E-15	-0.000009176	-0.000001023	233-1
233	0.5	Gru1 Ult1.7	Combination	-186.8661	-0.00001598	-0.0001433	3.397E-15	0.00006246	0.000006966	233-1
233	1	Gru1 Ult1.7	Combination	-186.082	-0.00001598	-0.0001433	3.397E-15	0.00013	0.00001496	233-1
234	0	Grupo 1	Combination	-116.9868	0.0001377	0.0012	2.22E-15	0.00007833	0.000008817	234-1
234	0.5	Grupo 1	Combination	-116.3836	0.0001377	0.0012	2.22E-15	-0.00053	-0.00006002	234-1
234	1	Grupo 1	Combination	-115.7804	0.0001377	0.0012	2.22E-15	-0.00114	-0.00013	234-1
234	0	Gru1 Ult1.7	Combination	-186.082	0.0002335	0.0021	3.774E-15	0.00013	0.00001496	234-1
234	0.5	Gru1 Ult1.7	Combination	-185.2979	0.0002335	0.0021	3.774E-15	-0.00091	-0.0001	234-1
234	1	Gru1 Ult1.7	Combination	-184.5137	0.0002335	0.0021	3.774E-15	-0.00196	-0.00022	234-1
235	0	Grupo 1	Combination	-115.7804	-0.002	-0.0179	2.216E-16	-0.00114	-0.00013	235-1
235	0.5	Grupo 1	Combination	-115.1772	-0.002	-0.0179	2.216E-16	0.00779	0.00088	235-1
235	1	Grupo 1	Combination	-114.574	-0.002	-0.0179	2.216E-16	0.01673	0.00188	235-1
235	0	Gru1 Ult1.7	Combination	-184.5137	-0.0034	-0.0306	3.769E-16	-0.00196	-0.00022	235-1
235	0.5	Gru1 Ult1.7	Combination	-183.7296	-0.0034	-0.0306	3.769E-16	0.01334	0.00149	235-1
235	1	Gru1 Ult1.7	Combination	-182.9454	-0.0034	-0.0306	3.769E-16	0.02865	0.00319	235-1
236	0	Grupo 1	Combination	-114.574	0.0294	0.2613	3.774E-15	0.01673	0.00188	236-1
236	0.5	Grupo 1	Combination	-113.9709	0.0294	0.2613	3.774E-15	-0.11392	-0.01282	236-1
236	1	Grupo 1	Combination	-113.3677	0.0294	0.2613	3.774E-15	-0.24458	-0.02753	236-1
236	0	Gru1 Ult1.7	Combination	-182.9454	0.0499	0.4473	6.417E-15	0.02865	0.00319	236-1
236	0.5	Gru1 Ult1.7	Combination	-182.1613	0.0499	0.4473	6.417E-15	-0.19502	-0.02175	236-1
236	1	Gru1 Ult1.7	Combination	-181.3771	0.0499	0.4473	6.417E-15	-0.41869	-0.0467	236-1

237	0	Grupo 1	Combination	-113.3677	-0.4311	-3.8301	1.777E-15	-0.24458	-0.02753	237-1
237	0.5	Grupo 1	Combination	-112.7645	-0.4311	-3.8301	1.777E-15	1.67045	0.18802	237-1
237	1	Grupo 1	Combination	-112.1613	-0.4311	-3.8301	1.777E-15	3.58549	0.40356	237-1
237	0	Gru1 Ult1.7	Combination	-181.3771	-0.7312	-6.5567	3.021E-15	-0.41869	-0.0467	237-1
237	0.5	Gru1 Ult1.7	Combination	-180.593	-0.7312	-6.5567	3.021E-15	2.85967	0.31893	237-1
237	1	Gru1 Ult1.7	Combination	-179.8089	-0.7312	-6.5567	3.021E-15	6.13804	0.68455	237-1
238	0	Grupo 1	Combination	-112.1613	6.3008	55.9782	8.674E-19	3.58549	0.40356	238-1
238	0.5	Grupo 1	Combination	-111.5581	6.3008	55.9782	8.674E-19	-24.40359	-2.74683	238-1
238	1	Grupo 1	Combination	-110.9549	6.3008	55.9782	8.674E-19	-52.39267	-5.89722	238-1
238	0	Gru1 Ult1.7	Combination	-179.8089	10.6879	95.8295	1.128E-18	6.13804	0.68455	238-1
238	0.5	Gru1 Ult1.7	Combination	-179.0247	10.6879	95.8295	1.128E-18	-41.77673	-4.65941	238-1
238	1	Gru1 Ult1.7	Combination	-178.2406	10.6879	95.8295	1.128E-18	-89.6915	-10.00337	238-1
239	0	Grupo 1	Combination	-110.9549	-4.2073	-29.1751	1.301E-18	-52.39267	-5.89722	239-1
239	0.5	Grupo 1	Combination	-110.3517	-4.2073	-29.1751	1.301E-18	-37.8051	-3.79359	239-1
239	1	Grupo 1	Combination	-109.7486	-4.2073	-29.1751	1.301E-18	-23.21753	-1.68995	239-1
239	0	Gru1 Ult1.7	Combination	-178.2406	-7.1329	-49.3326	1.691E-18	-89.6915	-10.00337	239-1
239	0.5	Gru1 Ult1.7	Combination	-177.4564	-7.1329	-49.3326	1.691E-18	-65.02519	-6.4369	239-1
239	1	Gru1 Ult1.7	Combination	-176.6723	-7.1329	-49.3326	1.691E-18	-40.35887	-2.87043	239-1
240	0	Grupo 1	Combination	-109.7486	-4.2073	-29.1751	8.674E-19	-23.21753	-1.68995	240-1
240	0.5	Grupo 1	Combination	-109.1454	-4.2073	-29.1751	8.674E-19	-8.62996	0.41368	240-1
240	1	Grupo 1	Combination	-108.5422	-4.2073	-29.1751	8.674E-19	5.95761	2.51732	240-1
240	0	Gru1 Ult1.7	Combination	-176.6723	-7.1329	-49.3326	1.128E-18	-40.35887	-2.87043	240-1
240	0.5	Gru1 Ult1.7	Combination	-175.8882	-7.1329	-49.3326	1.128E-18	-15.69256	0.69604	240-1
240	1	Gru1 Ult1.7	Combination	-175.104	-7.1329	-49.3326	1.128E-18	8.97375	4.26251	240-1
241	0	Grupo 1	Combination	-108.5422	-4.2073	-29.1751	-3.997E-15	5.95761	2.51732	241-1
241	0.5	Grupo 1	Combination	-107.939	-4.2073	-29.1751	-3.997E-15	20.54518	4.62095	241-1
241	1	Grupo 1	Combination	-107.3358	-4.2073	-29.1751	-3.997E-15	35.13274	6.72459	241-1
241	0	Gru1 Ult1.7	Combination	-175.104	-7.1329	-49.3326	-6.795E-15	8.97375	4.26251	241-1
241	0.5	Gru1 Ult1.7	Combination	-174.3199	-7.1329	-49.3326	-6.795E-15	33.64006	7.82898	241-1
241	1	Gru1 Ult1.7	Combination	-173.5357	-7.1329	-49.3326	-6.795E-15	58.30637	11.39545	241-1
242	0	Grupo 1	Combination	-123.4362	0	-1.555E-16	0	0	0	242-1
242	0.5	Grupo 1	Combination	-122.833	0	-1.555E-16	0	7.775E-17	0	242-1
242	1	Grupo 1	Combination	-122.2299	0	-1.555E-16	0	1.555E-16	0	242-1
242	0	Gru1 Ult1.7	Combination	-191.7842	0	-2.665E-16	0	0	0	242-1
242	0.5	Gru1 Ult1.7	Combination	-191.0001	0	-2.665E-16	0	1.332E-16	0	242-1
242	1	Gru1 Ult1.7	Combination	-190.216	0	-2.665E-16	0	2.665E-16	0	242-1
243	0	Grupo 1	Combination	-122.2299	0	2.437E-15	0	1.555E-16	0	243-1
243	0.5	Grupo 1	Combination	-121.6267	0	2.437E-15	0	-1.063E-15	0	243-1
243	1	Grupo 1	Combination	-121.0235	0	2.437E-15	0	-2.282E-15	0	243-1
243	0	Gru1 Ult1.7	Combination	-190.216	0	4.176E-15	0	2.665E-16	0	243-1
243	0.5	Gru1 Ult1.7	Combination	-189.4318	0	4.176E-15	0	-1.822E-15	0	243-1
243	1	Gru1 Ult1.7	Combination	-188.6477	0	4.176E-15	0	-3.91E-15	0	243-1
244	0	Grupo 1	Combination	-121.0235	0	-3.561E-14	0	-2.282E-15	0	244-1
244	0.5	Grupo 1	Combination	-120.4203	0	-3.561E-14	0	1.552E-14	0	244-1
244	1	Grupo 1	Combination	-119.8171	0	-3.561E-14	0	3.332E-14	0	244-1

244	0	Gru1 Ult1.7	Combination	-188.6477	0	-6.101E-14	0	-3.91E-15	0	244-1
244	0.5	Gru1 Ult1.7	Combination	-187.8635	0	-6.101E-14	0	2.66E-14	0	244-1
244	1	Gru1 Ult1.7	Combination	-187.0794	0	-6.101E-14	0	5.71E-14	0	244-1
245	0	Grupo 1	Combination	-119.8171	0	5.2E-13	0	3.332E-14	0	245-1
245	0.5	Grupo 1	Combination	-119.2139	0	5.2E-13	0	-2.267E-13	0	245-1
245	1	Grupo 1	Combination	-118.6107	0	5.2E-13	0	-4.867E-13	0	245-1
245	0	Gru1 Ult1.7	Combination	-187.0794	0	8.911E-13	0	5.71E-14	0	245-1
245	0.5	Gru1 Ult1.7	Combination	-186.2953	0	8.911E-13	0	-3.884E-13	0	245-1
245	1	Gru1 Ult1.7	Combination	-185.5111	0	8.911E-13	0	-8.34E-13	0	245-1
246	0	Grupo 1	Combination	-118.6107	0	-7.594E-12	0	-4.867E-13	0	246-1
246	0.5	Grupo 1	Combination	-118.0076	0	-7.594E-12	0	3.311E-12	0	246-1
246	1	Grupo 1	Combination	-117.4044	0	-7.594E-12	0	7.108E-12	0	246-1
246	0	Gru1 Ult1.7	Combination	-185.5111	0	-1.301E-11	0	-8.34E-13	0	246-1
246	0.5	Gru1 Ult1.7	Combination	-184.727	0	-1.301E-11	0	5.673E-12	0	246-1
246	1	Gru1 Ult1.7	Combination	-183.9428	0	-1.301E-11	0	1.218E-11	0	246-1
247	0	Grupo 1	Combination	-117.4044	0	1.109E-10	0	7.108E-12	0	247-1
247	0.5	Grupo 1	Combination	-116.8012	0	1.109E-10	0	-4.835E-11	0	247-1
247	1	Grupo 1	Combination	-116.198	0	1.109E-10	0	-1.038E-10	0	247-1
247	0	Gru1 Ult1.7	Combination	-183.9428	0	1.901E-10	0	1.218E-11	0	247-1
247	0.5	Gru1 Ult1.7	Combination	-183.1587	0	1.901E-10	0	-8.285E-11	0	247-1
247	1	Gru1 Ult1.7	Combination	-182.3745	0	1.901E-10	0	-1.779E-10	0	247-1
248	0	Grupo 1	Combination	-116.198	0	-1.62E-09	0	-1.038E-10	0	248-1
248	0.5	Grupo 1	Combination	-115.5948	0	-1.62E-09	0	7.061E-10	0	248-1
248	1	Grupo 1	Combination	-114.9916	0	-1.62E-09	0	1.516E-09	0	248-1
248	0	Gru1 Ult1.7	Combination	-182.3745	0	-2.776E-09	0	-1.779E-10	0	248-1
248	0.5	Gru1 Ult1.7	Combination	-181.5904	0	-2.776E-09	0	1.21E-09	0	248-1
248	1	Gru1 Ult1.7	Combination	-180.8063	0	-2.776E-09	0	2.598E-09	0	248-1
249	0	Grupo 1	Combination	-114.9916	0	2.366E-08	0	1.516E-09	0	249-1
249	0.5	Grupo 1	Combination	-114.3884	0	2.366E-08	0	-1.031E-08	0	249-1
249	1	Grupo 1	Combination	-113.7853	0	2.366E-08	0	-2.214E-08	0	249-1
249	0	Gru1 Ult1.7	Combination	-180.8063	0	4.054E-08	0	2.598E-09	0	249-1
249	0.5	Gru1 Ult1.7	Combination	-180.0221	0	4.054E-08	0	-1.767E-08	0	249-1
249	1	Gru1 Ult1.7	Combination	-179.238	0	4.054E-08	0	-3.794E-08	0	249-1
250	0	Grupo 1	Combination	-113.7853	0	-3.455E-07	0	-2.214E-08	0	250-1
250	0.5	Grupo 1	Combination	-113.1821	0	-3.455E-07	0	1.506E-07	0	250-1
250	1	Grupo 1	Combination	-112.5789	0	-3.455E-07	0	3.233E-07	0	250-1
250	0	Gru1 Ult1.7	Combination	-179.238	0	-0.000000592	0	-3.794E-08	0	250-1
250	0.5	Gru1 Ult1.7	Combination	-178.4538	0	-0.000000592	0	2.581E-07	0	250-1
250	1	Gru1 Ult1.7	Combination	-177.6697	0	-0.000000592	0	5.541E-07	0	250-1
251	0	Grupo 1	Combination	-112.5789	-6.157E-20	0.000005046	0	3.233E-07	0	251-1
251	0.5	Grupo 1	Combination	-111.9757	-6.157E-20	0.000005046	0	-0.000002199	2.684E-20	251-1
251	1	Grupo 1	Combination	-111.3725	-6.157E-20	0.000005046	0	-0.000004722	5.762E-20	251-1
251	0	Gru1 Ult1.7	Combination	-177.6697	-7.16E-20	0.000008646	0	5.541E-07	0	251-1
251	0.5	Gru1 Ult1.7	Combination	-176.8856	-7.16E-20	0.000008646	0	-0.000003769	3.121E-20	251-1
251	1	Gru1 Ult1.7	Combination	-176.1014	-7.16E-20	0.000008646	0	-0.000008092	6.701E-20	251-1

252	0	Grupo 1	Combination	-111.3725	8.998E-19	-0.00007374	0	-0.000004722	5.762E-20	252-1
252	0.5	Grupo 1	Combination	-110.7693	8.998E-19	-0.00007374	0	0.00003215	-3.923E-19	252-1
252	1	Grupo 1	Combination	-110.1661	8.998E-19	-0.00007374	0	0.00006901	-8.421E-19	252-1
252	0	Gru1 Ult1.7	Combination	-176.1014	1.046E-18	-0.0001263	0	-0.000008092	6.701E-20	252-1
252	0.5	Gru1 Ult1.7	Combination	-175.3173	1.046E-18	-0.0001263	0	0.00005508	-4.562E-19	252-1
252	1	Gru1 Ult1.7	Combination	-174.5331	1.046E-18	-0.0001263	0	0.00012	-9.793E-19	252-1
253	0	Grupo 1	Combination	-110.1661	-1.315E-17	0.0011	0	0.00006901	-8.421E-19	253-1
253	0.5	Grupo 1	Combination	-109.563	-1.315E-17	0.0011	0	-0.00047	5.733E-18	253-1
253	1	Grupo 1	Combination	-108.9598	-1.315E-17	0.0011	0	-0.00101	1.231E-17	253-1
253	0	Gru1 Ult1.7	Combination	-174.5331	-1.529E-17	0.0018	0	0.00012	-9.793E-19	253-1
253	0.5	Gru1 Ult1.7	Combination	-173.749	-1.529E-17	0.0018	0	-0.00081	6.667E-18	253-1
253	1	Gru1 Ult1.7	Combination	-172.9649	-1.529E-17	0.0018	0	-0.00173	1.431E-17	253-1
254	0	Grupo 1	Combination	-108.9598	1.922E-16	-0.0158	0	-0.00101	1.231E-17	254-1
254	0.5	Grupo 1	Combination	-108.3566	1.922E-16	-0.0158	0	0.00687	-8.379E-17	254-1
254	1	Grupo 1	Combination	-107.7534	1.922E-16	-0.0158	0	0.01474	-1.799E-16	254-1
254	0	Gru1 Ult1.7	Combination	-172.9649	2.235E-16	-0.027	0	-0.00173	1.431E-17	254-1
254	0.5	Gru1 Ult1.7	Combination	-172.1807	2.235E-16	-0.027	0	0.01177	-9.745E-17	254-1
254	1	Gru1 Ult1.7	Combination	-171.3966	2.235E-16	-0.027	0	0.02526	-2.092E-16	254-1
255	0	Grupo 1	Combination	-107.7534	-2.809E-15	0.2302	0	0.01474	-1.799E-16	255-1
255	0.5	Grupo 1	Combination	-107.1502	-2.809E-15	0.2302	0	-0.10037	1.225E-15	255-1
255	1	Grupo 1	Combination	-106.547	-2.809E-15	0.2302	0	-0.21548	2.629E-15	255-1
255	0	Gru1 Ult1.7	Combination	-171.3966	-3.267E-15	0.3945	0	0.02526	-2.092E-16	255-1
255	0.5	Gru1 Ult1.7	Combination	-170.6124	-3.267E-15	0.3945	0	-0.17198	1.424E-15	255-1
255	1	Gru1 Ult1.7	Combination	-169.8283	-3.267E-15	0.3945	0	-0.36923	3.058E-15	255-1
256	0	Grupo 1	Combination	-106.547	4.118E-14	-3.3743	0	-0.21548	2.629E-15	256-1
256	0.5	Grupo 1	Combination	-105.9438	4.118E-14	-3.3743	0	1.4717	-1.796E-14	256-1
256	1	Grupo 1	Combination	-105.3407	4.118E-14	-3.3743	0	3.15887	-3.855E-14	256-1
256	0	Gru1 Ult1.7	Combination	-169.8283	4.788E-14	-5.7821	0	-0.36923	3.058E-15	256-1
256	0.5	Gru1 Ult1.7	Combination	-169.0441	4.788E-14	-5.7821	0	2.52182	-2.088E-14	256-1
256	1	Gru1 Ult1.7	Combination	-168.26	4.788E-14	-5.7821	0	5.41288	-4.483E-14	256-1
257	0	Grupo 1	Combination	-105.3407	-6.018E-13	49.3175	0	3.15887	-3.855E-14	257-1
257	0.5	Grupo 1	Combination	-104.7375	-6.018E-13	49.3175	0	-21.4999	2.623E-13	257-1
257	1	Grupo 1	Combination	-104.1343	-6.018E-13	49.3175	0	-46.15866	5.632E-13	257-1
257	0	Gru1 Ult1.7	Combination	-168.26	-6.998E-13	84.5079	0	5.41288	-4.483E-14	257-1
257	0.5	Gru1 Ult1.7	Combination	-167.4759	-6.998E-13	84.5079	0	-36.84109	3.051E-13	257-1
257	1	Gru1 Ult1.7	Combination	-166.6917	-6.998E-13	84.5079	0	-79.09506	6.55E-13	257-1
258	0	Grupo 1	Combination	-104.1343	1.327E-13	-25.4584	0	-46.15866	5.632E-13	258-1
258	0.5	Grupo 1	Combination	-103.5311	1.327E-13	-25.4584	0	-33.42947	4.968E-13	258-1
258	1	Grupo 1	Combination	-102.9279	1.327E-13	-25.4584	0	-20.70027	4.305E-13	258-1
258	0	Gru1 Ult1.7	Combination	-166.6917	1.172E-13	-43.0161	0	-79.09506	6.55E-13	258-1
258	0.5	Gru1 Ult1.7	Combination	-165.9076	1.172E-13	-43.0161	0	-57.58703	5.964E-13	258-1
258	1	Gru1 Ult1.7	Combination	-165.1234	1.172E-13	-43.0161	0	-36.079	5.378E-13	258-1
259	0	Grupo 1	Combination	-102.9279	1.327E-13	-25.4584	0	-20.70027	4.305E-13	259-1
259	0.5	Grupo 1	Combination	-102.3247	1.327E-13	-25.4584	0	-7.97108	3.641E-13	259-1
259	1	Grupo 1	Combination	-101.7215	1.327E-13	-25.4584	0	4.75811	2.978E-13	259-1

259	0	Gru1 Ult1.7	Combination	-165.1234	1.172E-13	-43.0161	0	-36.079	5.378E-13	259-1
259	0.5	Gru1 Ult1.7	Combination	-164.3393	1.172E-13	-43.0161	0	-14.57096	4.792E-13	259-1
259	1	Gru1 Ult1.7	Combination	-163.5552	1.172E-13	-43.0161	0	6.93707	4.206E-13	259-1
260	0	Grupo 1	Combination	-101.7215	1.327E-13	-25.4584	0	4.75811	2.978E-13	260-1
260	0.5	Grupo 1	Combination	-101.1184	1.327E-13	-25.4584	0	17.48731	2.314E-13	260-1
260	1	Grupo 1	Combination	-100.5152	1.327E-13	-25.4584	0	30.2165	1.651E-13	260-1
260	0	Gru1 Ult1.7	Combination	-163.5552	1.172E-13	-43.0161	0	6.93707	4.206E-13	260-1
260	0.5	Gru1 Ult1.7	Combination	-162.771	1.172E-13	-43.0161	0	28.4451	3.62E-13	260-1
260	1	Gru1 Ult1.7	Combination	-161.9869	1.172E-13	-43.0161	0	49.95314	3.035E-13	260-1
261	0	Grupo 1	Combination	-130.2569	1.987E-17	-1.765E-16	0	0	0	261-1
261	0.5	Grupo 1	Combination	-129.6537	1.987E-17	-1.765E-16	0	8.825E-17	-9.933E-18	261-1
261	1	Grupo 1	Combination	-129.0505	1.987E-17	-1.765E-16	0	1.765E-16	-1.987E-17	261-1
261	0	Gru1 Ult1.7	Combination	-203.3331	3.37E-17	-3.022E-16	0	0	0	261-1
261	0.5	Gru1 Ult1.7	Combination	-202.549	3.37E-17	-3.022E-16	0	1.511E-16	-1.685E-17	261-1
261	1	Gru1 Ult1.7	Combination	-201.7648	3.37E-17	-3.022E-16	0	3.022E-16	-3.37E-17	261-1
262	0	Grupo 1	Combination	-129.0505	-3.114E-16	2.766E-15	0	1.765E-16	-1.987E-17	262-1
262	0.5	Grupo 1	Combination	-128.4473	-3.114E-16	2.766E-15	0	-1.207E-15	1.358E-16	262-1
262	1	Grupo 1	Combination	-127.8441	-3.114E-16	2.766E-15	0	-2.59E-15	2.915E-16	262-1
262	0	Gru1 Ult1.7	Combination	-201.7648	-5.282E-16	4.736E-15	0	3.022E-16	-3.37E-17	262-1
262	0.5	Gru1 Ult1.7	Combination	-200.9807	-5.282E-16	4.736E-15	0	-2.066E-15	2.304E-16	262-1
262	1	Gru1 Ult1.7	Combination	-200.1965	-5.282E-16	4.736E-15	0	-4.434E-15	4.945E-16	262-1
263	0	Grupo 1	Combination	-127.8441	4.549E-15	-4.041E-14	-1.776E-15	-2.59E-15	2.915E-16	263-1
263	0.5	Grupo 1	Combination	-127.2409	4.549E-15	-4.041E-14	-1.776E-15	1.762E-14	-1.983E-15	263-1
263	1	Grupo 1	Combination	-126.6378	4.549E-15	-4.041E-14	-1.776E-15	3.782E-14	-4.257E-15	263-1
263	0	Gru1 Ult1.7	Combination	-200.1965	7.716E-15	-6.919E-14	-3.02E-15	-4.434E-15	4.945E-16	263-1
263	0.5	Gru1 Ult1.7	Combination	-199.4124	7.716E-15	-6.919E-14	-3.02E-15	3.016E-14	-3.364E-15	263-1
263	1	Gru1 Ult1.7	Combination	-198.6283	7.716E-15	-6.919E-14	-3.02E-15	6.475E-14	-7.222E-15	263-1
264	0	Grupo 1	Combination	-126.6378	-6.643E-14	5.902E-13	-4.437E-16	3.782E-14	-4.257E-15	264-1
264	0.5	Grupo 1	Combination	-126.0346	-6.643E-14	5.902E-13	-4.437E-16	-2.573E-13	2.896E-14	264-1
264	1	Grupo 1	Combination	-125.4314	-6.643E-14	5.902E-13	-4.437E-16	-5.524E-13	6.218E-14	264-1
264	0	Gru1 Ult1.7	Combination	-198.6283	-1.127E-13	1.01E-12	-7.544E-16	6.475E-14	-7.222E-15	264-1
264	0.5	Gru1 Ult1.7	Combination	-197.8441	-1.127E-13	1.01E-12	-7.544E-16	-4.405E-13	4.912E-14	264-1
264	1	Gru1 Ult1.7	Combination	-197.06	-1.127E-13	1.01E-12	-7.544E-16	-9.457E-13	1.055E-13	264-1
265	0	Grupo 1	Combination	-125.4314	9.702E-13	-8.62E-12	-2.216E-16	-5.524E-13	6.218E-14	265-1
265	0.5	Grupo 1	Combination	-124.8282	9.702E-13	-8.62E-12	-2.216E-16	3.758E-12	-4.229E-13	265-1
265	1	Grupo 1	Combination	-124.225	9.702E-13	-8.62E-12	-2.216E-16	8.068E-12	-9.08E-13	265-1
265	0	Gru1 Ult1.7	Combination	-197.06	1.646E-12	-1.476E-11	-3.769E-16	-9.457E-13	1.055E-13	265-1
265	0.5	Gru1 Ult1.7	Combination	-196.2758	1.646E-12	-1.476E-11	-3.769E-16	6.433E-12	-7.174E-13	265-1
265	1	Gru1 Ult1.7	Combination	-195.4917	1.646E-12	-1.476E-11	-3.769E-16	1.381E-11	-1.54E-12	265-1
266	0	Grupo 1	Combination	-124.225	-1.417E-11	1.259E-10	-1.776E-15	8.068E-12	-9.08E-13	266-1
266	0.5	Grupo 1	Combination	-123.6218	-1.417E-11	1.259E-10	-1.776E-15	-5.488E-11	6.177E-12	266-1
266	1	Grupo 1	Combination	-123.0186	-1.417E-11	1.259E-10	-1.776E-15	-1.178E-10	1.326E-11	266-1
266	0	Gru1 Ult1.7	Combination	-195.4917	-2.404E-11	2.155E-10	-3.02E-15	1.381E-11	-1.54E-12	266-1
266	0.5	Gru1 Ult1.7	Combination	-194.7075	-2.404E-11	2.155E-10	-3.02E-15	-9.395E-11	1.048E-11	266-1
266	1	Gru1 Ult1.7	Combination	-193.9234	-2.404E-11	2.155E-10	-3.02E-15	-2.017E-10	2.25E-11	266-1

267	0	Grupo 1	Combination	-123.0186	2.069E-10	-1.839E-09	1.998E-15	-1.178E-10	1.326E-11	267-1
267	0.5	Grupo 1	Combination	-122.4155	2.069E-10	-1.839E-09	1.998E-15	8.015E-10	-9.021E-11	267-1
267	1	Grupo 1	Combination	-121.8123	2.069E-10	-1.839E-09	1.998E-15	1.721E-09	-1.937E-10	267-1
267	0	Gru1 Ult1.7	Combination	-193.9234	3.51E-10	-3.147E-09	3.397E-15	-2.017E-10	2.25E-11	267-1
267	0.5	Gru1 Ult1.7	Combination	-193.1393	3.51E-10	-3.147E-09	3.397E-15	1.372E-09	-1.53E-10	267-1
267	1	Gru1 Ult1.7	Combination	-192.3551	3.51E-10	-3.147E-09	3.397E-15	2.946E-09	-3.285E-10	267-1
268	0	Grupo 1	Combination	-121.8123	-3.022E-09	2.685E-08	4.437E-16	1.721E-09	-1.937E-10	268-1
268	0.5	Grupo 1	Combination	-121.2091	-3.022E-09	2.685E-08	4.437E-16	-1.17E-08	1.317E-09	268-1
268	1	Grupo 1	Combination	-120.6059	-3.022E-09	2.685E-08	4.437E-16	-2.513E-08	2.829E-09	268-1
268	0	Gru1 Ult1.7	Combination	-192.3551	-5.127E-09	4.597E-08	7.544E-16	2.946E-09	-3.285E-10	268-1
268	0.5	Gru1 Ult1.7	Combination	-191.571	-5.127E-09	4.597E-08	7.544E-16	-2.004E-08	2.235E-09	268-1
268	1	Gru1 Ult1.7	Combination	-190.7868	-5.127E-09	4.597E-08	7.544E-16	-4.302E-08	4.798E-09	268-1
269	0	Grupo 1	Combination	-120.6059	4.414E-08	-3.921E-07	1.776E-15	-2.513E-08	2.829E-09	269-1
269	0.5	Grupo 1	Combination	-120.0027	4.414E-08	-3.921E-07	1.776E-15	1.709E-07	-1.924E-08	269-1
269	1	Grupo 1	Combination	-119.3995	4.414E-08	-3.921E-07	1.776E-15	0.000000367	-4.131E-08	269-1
269	0	Gru1 Ult1.7	Combination	-190.7868	7.487E-08	-6.713E-07	3.02E-15	-4.302E-08	4.798E-09	269-1
269	0.5	Gru1 Ult1.7	Combination	-190.0027	7.487E-08	-6.713E-07	3.02E-15	2.926E-07	-3.264E-08	269-1
269	1	Gru1 Ult1.7	Combination	-189.2186	7.487E-08	-6.713E-07	3.02E-15	6.283E-07	-7.007E-08	269-1
270	0	Grupo 1	Combination	-119.3995	-6.446E-07	0.000005727	1.998E-15	0.000000367	-4.131E-08	270-1
270	0.5	Grupo 1	Combination	-118.7963	-6.446E-07	0.000005727	1.998E-15	-0.000002497	0.000000281	270-1
270	1	Grupo 1	Combination	-118.1932	-6.446E-07	0.000005727	1.998E-15	-0.00000536	6.033E-07	270-1
270	0	Gru1 Ult1.7	Combination	-189.2186	-0.000001093	0.000009804	3.396E-15	6.283E-07	-7.007E-08	270-1
270	0.5	Gru1 Ult1.7	Combination	-188.4344	-0.000001093	0.000009804	3.396E-15	-0.000004274	4.766E-07	270-1
270	1	Gru1 Ult1.7	Combination	-187.6503	-0.000001093	0.000009804	3.396E-15	-0.000009176	0.000001023	270-1
271	0	Grupo 1	Combination	-118.1932	0.00000942	-0.00008369	-1.998E-15	-0.00000536	6.033E-07	271-1
271	0.5	Grupo 1	Combination	-117.59	0.00000942	-0.00008369	-1.998E-15	0.00003649	-0.000004107	271-1
271	1	Grupo 1	Combination	-116.9868	0.00000942	-0.00008369	-1.998E-15	0.00007833	-0.000008817	271-1
271	0	Gru1 Ult1.7	Combination	-187.6503	0.00001598	-0.0001433	-3.396E-15	-0.000009176	0.000001023	271-1
271	0.5	Gru1 Ult1.7	Combination	-186.8661	0.00001598	-0.0001433	-3.396E-15	0.00006246	-0.000006966	271-1
271	1	Gru1 Ult1.7	Combination	-186.082	0.00001598	-0.0001433	-3.396E-15	0.00013	-0.00001496	271-1
272	0	Grupo 1	Combination	-116.9868	-0.0001377	0.0012	-1.998E-15	0.00007833	-0.000008817	272-1
272	0.5	Grupo 1	Combination	-116.3836	-0.0001377	0.0012	-1.998E-15	-0.00053	0.00006002	272-1
272	1	Grupo 1	Combination	-115.7804	-0.0001377	0.0012	-1.998E-15	-0.00114	0.00013	272-1
272	0	Gru1 Ult1.7	Combination	-186.082	-0.0002335	0.0021	-3.397E-15	0.00013	-0.00001496	272-1
272	0.5	Gru1 Ult1.7	Combination	-185.2979	-0.0002335	0.0021	-3.397E-15	-0.00091	0.0001	272-1
272	1	Gru1 Ult1.7	Combination	-184.5137	-0.0002335	0.0021	-3.397E-15	-0.00196	0.00022	272-1
273	0	Grupo 1	Combination	-115.7804	0.002	-0.0179	-1.998E-15	-0.00114	0.00013	273-1
273	0.5	Grupo 1	Combination	-115.1772	0.002	-0.0179	-1.998E-15	0.00779	-0.00088	273-1
273	1	Grupo 1	Combination	-114.574	0.002	-0.0179	-1.998E-15	0.01673	-0.00188	273-1
273	0	Gru1 Ult1.7	Combination	-184.5137	0.0034	-0.0306	-3.397E-15	-0.00196	0.00022	273-1
273	0.5	Gru1 Ult1.7	Combination	-183.7296	0.0034	-0.0306	-3.397E-15	0.01334	-0.00149	273-1
273	1	Gru1 Ult1.7	Combination	-182.9454	0.0034	-0.0306	-3.397E-15	0.02865	-0.00319	273-1
274	0	Grupo 1	Combination	-114.574	-0.0294	0.2613	-1.998E-15	0.01673	-0.00188	274-1
274	0.5	Grupo 1	Combination	-113.9709	-0.0294	0.2613	-1.998E-15	-0.11392	0.01282	274-1
274	1	Grupo 1	Combination	-113.3677	-0.0294	0.2613	-1.998E-15	-0.24458	0.02753	274-1

274	0	Gru1 Ult1.7	Combination	-182.9454	-0.0499	0.4473	-3.397E-15	0.02865	-0.00319	274-1
274	0.5	Gru1 Ult1.7	Combination	-182.1613	-0.0499	0.4473	-3.397E-15	-0.19502	0.02175	274-1
274	1	Gru1 Ult1.7	Combination	-181.3771	-0.0499	0.4473	-3.397E-15	-0.41869	0.0467	274-1
275	0	Grupo 1	Combination	-113.3677	0.4311	-3.8301	2.216E-16	-0.24458	0.02753	275-1
275	0.5	Grupo 1	Combination	-112.7645	0.4311	-3.8301	2.216E-16	1.67045	-0.18802	275-1
275	1	Grupo 1	Combination	-112.1613	0.4311	-3.8301	2.216E-16	3.58549	-0.40356	275-1
275	0	Gru1 Ult1.7	Combination	-181.3771	0.7312	-6.5567	3.769E-16	-0.41869	0.0467	275-1
275	0.5	Gru1 Ult1.7	Combination	-180.593	0.7312	-6.5567	3.769E-16	2.85967	-0.31893	275-1
275	1	Gru1 Ult1.7	Combination	-179.8089	0.7312	-6.5567	3.769E-16	6.13804	-0.68455	275-1
276	0	Grupo 1	Combination	-112.1613	-6.3008	55.9782	-8.674E-19	3.58549	-0.40356	276-1
276	0.5	Grupo 1	Combination	-111.5581	-6.3008	55.9782	-8.674E-19	-24.40359	2.74683	276-1
276	1	Grupo 1	Combination	-110.9549	-6.3008	55.9782	-8.674E-19	-52.39267	5.89722	276-1
276	0	Gru1 Ult1.7	Combination	-179.8089	-10.6879	95.8295	-1.128E-18	6.13804	-0.68455	276-1
276	0.5	Gru1 Ult1.7	Combination	-179.0247	-10.6879	95.8295	-1.128E-18	-41.77673	4.65941	276-1
276	1	Gru1 Ult1.7	Combination	-178.2406	-10.6879	95.8295	-1.128E-18	-89.6915	10.00337	276-1
277	0	Grupo 1	Combination	-110.9549	4.2073	-29.1751	-4.337E-19	-52.39267	5.89722	277-1
277	0.5	Grupo 1	Combination	-110.3517	4.2073	-29.1751	-4.337E-19	-37.8051	3.79359	277-1
277	1	Grupo 1	Combination	-109.7486	4.2073	-29.1751	-4.337E-19	-23.21753	1.68995	277-1
277	0	Gru1 Ult1.7	Combination	-178.2406	7.1329	-49.3326	-5.638E-19	-89.6915	10.00337	277-1
277	0.5	Gru1 Ult1.7	Combination	-177.4564	7.1329	-49.3326	-5.638E-19	-65.02519	6.4369	277-1
277	1	Gru1 Ult1.7	Combination	-176.6723	7.1329	-49.3326	-5.638E-19	-40.35887	2.87043	277-1
278	0	Grupo 1	Combination	-109.7486	4.2073	-29.1751	-4.337E-19	-23.21753	1.68995	278-1
278	0.5	Grupo 1	Combination	-109.1454	4.2073	-29.1751	-4.337E-19	-8.62996	-0.41368	278-1
278	1	Grupo 1	Combination	-108.5422	4.2073	-29.1751	-4.337E-19	5.95761	-2.51732	278-1
278	0	Gru1 Ult1.7	Combination	-176.6723	7.1329	-49.3326	-5.638E-19	-40.35887	2.87043	278-1
278	0.5	Gru1 Ult1.7	Combination	-175.8882	7.1329	-49.3326	-5.638E-19	-15.69256	-0.69604	278-1
278	1	Gru1 Ult1.7	Combination	-175.104	7.1329	-49.3326	-5.638E-19	8.97375	-4.26251	278-1
279	0	Grupo 1	Combination	-108.5422	4.2073	-29.1751	2.217E-15	5.95761	-2.51732	279-1
279	0.5	Grupo 1	Combination	-107.939	4.2073	-29.1751	2.217E-15	20.54518	-4.62095	279-1
279	1	Grupo 1	Combination	-107.3358	4.2073	-29.1751	2.217E-15	35.13274	-6.72459	279-1
279	0	Gru1 Ult1.7	Combination	-175.104	7.1329	-49.3326	3.77E-15	8.97375	-4.26251	279-1
279	0.5	Gru1 Ult1.7	Combination	-174.3199	7.1329	-49.3326	3.77E-15	33.64006	-7.82898	279-1
279	1	Gru1 Ult1.7	Combination	-173.5357	7.1329	-49.3326	3.77E-15	58.30637	-11.39545	279-1
280	0	Grupo 1	Combination	17.3473	-1.95E-17	-1.733E-16	0	0	0	280-1
280	0.5	Grupo 1	Combination	17.9505	-1.95E-17	-1.733E-16	0	8.665E-17	9.749E-18	280-1
280	1	Grupo 1	Combination	18.5536	-1.95E-17	-1.733E-16	0	1.733E-16	1.95E-17	280-1
280	0	Gru1 Ult1.7	Combination	56.5506	-3.322E-17	-2.98E-16	0	0	0	280-1
280	0.5	Gru1 Ult1.7	Combination	57.3348	-3.322E-17	-2.98E-16	0	1.49E-16	1.661E-17	280-1
280	1	Gru1 Ult1.7	Combination	58.1189	-3.322E-17	-2.98E-16	0	2.98E-16	3.322E-17	280-1
281	0	Grupo 1	Combination	18.5536	3.056E-16	2.716E-15	0	1.733E-16	1.95E-17	281-1
281	0.5	Grupo 1	Combination	19.1568	3.056E-16	2.716E-15	0	-1.185E-15	-1.333E-16	281-1
281	1	Grupo 1	Combination	19.76	3.056E-16	2.716E-15	0	-2.543E-15	-2.861E-16	281-1
281	0	Gru1 Ult1.7	Combination	58.1189	5.207E-16	4.671E-15	0	2.98E-16	3.322E-17	281-1
281	0.5	Gru1 Ult1.7	Combination	58.9031	5.207E-16	4.671E-15	0	-2.037E-15	-2.271E-16	281-1
281	1	Gru1 Ult1.7	Combination	59.6872	5.207E-16	4.671E-15	0	-4.373E-15	-4.874E-16	281-1

282	0	Grupo 1	Combination	19.76	-4.464E-15	-3.968E-14	-4.337E-19	-2.543E-15	-2.861E-16	282-1
282	0.5	Grupo 1	Combination	20.3632	-4.464E-15	-3.968E-14	-4.337E-19	1.73E-14	1.946E-15	282-1
282	1	Grupo 1	Combination	20.9664	-4.464E-15	-3.968E-14	-4.337E-19	3.714E-14	4.178E-15	282-1
282	0	Gru1 Ult1.7	Combination	59.6872	-7.606E-15	-6.823E-14	-5.638E-19	-4.373E-15	-4.874E-16	282-1
282	0.5	Gru1 Ult1.7	Combination	60.4713	-7.606E-15	-6.823E-14	-5.638E-19	2.974E-14	3.316E-15	282-1
282	1	Gru1 Ult1.7	Combination	61.2555	-7.606E-15	-6.823E-14	-5.638E-19	6.386E-14	7.119E-15	282-1
283	0	Grupo 1	Combination	20.9664	6.52E-14	5.795E-13	-1.998E-15	3.714E-14	4.178E-15	283-1
283	0.5	Grupo 1	Combination	21.5696	6.52E-14	5.795E-13	-1.998E-15	-2.526E-13	-2.842E-14	283-1
283	1	Grupo 1	Combination	22.1728	6.52E-14	5.795E-13	-1.998E-15	-5.424E-13	-6.102E-14	283-1
283	0	Gru1 Ult1.7	Combination	61.2555	1.111E-13	9.965E-13	-3.397E-15	6.386E-14	7.119E-15	283-1
283	0.5	Gru1 Ult1.7	Combination	62.0396	1.111E-13	9.965E-13	-3.397E-15	-4.344E-13	-4.842E-14	283-1
283	1	Gru1 Ult1.7	Combination	62.8238	1.111E-13	9.965E-13	-3.397E-15	-9.327E-13	-1.04E-13	283-1
284	0	Grupo 1	Combination	22.1728	-9.522E-13	-8.464E-12	-1.999E-15	-5.424E-13	-6.102E-14	284-1
284	0.5	Grupo 1	Combination	22.7759	-9.522E-13	-8.464E-12	-1.999E-15	3.689E-12	4.151E-13	284-1
284	1	Grupo 1	Combination	23.3791	-9.522E-13	-8.464E-12	-1.999E-15	7.921E-12	8.912E-13	284-1
284	0	Gru1 Ult1.7	Combination	62.8238	-1.622E-12	-1.455E-11	-3.398E-15	-9.327E-13	-1.04E-13	284-1
284	0.5	Gru1 Ult1.7	Combination	63.6079	-1.622E-12	-1.455E-11	-3.398E-15	6.344E-12	7.072E-13	284-1
284	1	Gru1 Ult1.7	Combination	64.392	-1.622E-12	-1.455E-11	-3.398E-15	1.362E-11	1.518E-12	284-1
285	0	Grupo 1	Combination	23.3791	1.391E-11	1.236E-10	-3.998E-15	7.921E-12	8.912E-13	285-1
285	0.5	Grupo 1	Combination	23.9823	1.391E-11	1.236E-10	-3.998E-15	-5.388E-11	-6.062E-12	285-1
285	1	Grupo 1	Combination	24.5855	1.391E-11	1.236E-10	-3.998E-15	-1.157E-10	-1.302E-11	285-1
285	0	Gru1 Ult1.7	Combination	64.392	2.369E-11	2.125E-10	-6.796E-15	1.362E-11	1.518E-12	285-1
285	0.5	Gru1 Ult1.7	Combination	65.1762	2.369E-11	2.125E-10	-6.796E-15	-9.265E-11	-1.033E-11	285-1
285	1	Gru1 Ult1.7	Combination	65.9603	2.369E-11	2.125E-10	-6.796E-15	-1.989E-10	-2.217E-11	285-1
286	0	Grupo 1	Combination	24.5855	-2.031E-10	-1.805E-09	-2.443E-15	-1.157E-10	-1.302E-11	286-1
286	0.5	Grupo 1	Combination	25.1887	-2.031E-10	-1.805E-09	-2.443E-15	7.869E-10	8.853E-11	286-1
286	1	Grupo 1	Combination	25.7919	-2.031E-10	-1.805E-09	-2.443E-15	1.69E-09	1.901E-10	286-1
286	0	Gru1 Ult1.7	Combination	65.9603	-3.46E-10	-3.104E-09	-4.153E-15	-1.989E-10	-2.217E-11	286-1
286	0.5	Gru1 Ult1.7	Combination	66.7445	-3.46E-10	-3.104E-09	-4.153E-15	1.353E-09	1.508E-10	286-1
286	1	Gru1 Ult1.7	Combination	67.5286	-3.46E-10	-3.104E-09	-4.153E-15	2.905E-09	3.239E-10	286-1
287	0	Grupo 1	Combination	25.7919	2.966E-09	2.636E-08	-1.999E-15	1.69E-09	1.901E-10	287-1
287	0.5	Grupo 1	Combination	26.3951	2.966E-09	2.636E-08	-1.999E-15	-1.149E-08	-1.293E-09	287-1
287	1	Grupo 1	Combination	26.9982	2.966E-09	2.636E-08	-1.999E-15	-2.467E-08	-2.776E-09	287-1
287	0	Gru1 Ult1.7	Combination	67.5286	5.054E-09	4.533E-08	-3.398E-15	2.905E-09	3.239E-10	287-1
287	0.5	Gru1 Ult1.7	Combination	68.3127	5.054E-09	4.533E-08	-3.398E-15	-1.976E-08	-2.203E-09	287-1
287	1	Gru1 Ult1.7	Combination	69.0969	5.054E-09	4.533E-08	-3.398E-15	-4.243E-08	-4.73E-09	287-1
288	0	Grupo 1	Combination	26.9982	-4.332E-08	-0.000000385	0	-2.467E-08	-2.776E-09	288-1
288	0.5	Grupo 1	Combination	27.6014	-4.332E-08	-0.000000385	0	1.678E-07	1.888E-08	288-1
288	1	Grupo 1	Combination	28.2046	-4.332E-08	-0.000000385	0	3.604E-07	4.054E-08	288-1
288	0	Gru1 Ult1.7	Combination	69.0969	-7.38E-08	-6.621E-07	0	-4.243E-08	-4.73E-09	288-1
288	0.5	Gru1 Ult1.7	Combination	69.881	-7.38E-08	-6.621E-07	0	2.886E-07	3.217E-08	288-1
288	1	Gru1 Ult1.7	Combination	70.6652	-7.38E-08	-6.621E-07	0	6.196E-07	6.907E-08	288-1
289	0	Grupo 1	Combination	28.2046	6.326E-07	0.000005623	0	3.604E-07	4.054E-08	289-1
289	0.5	Grupo 1	Combination	28.8078	6.326E-07	0.000005623	0	-0.000002451	-2.758E-07	289-1
289	1	Grupo 1	Combination	29.411	6.326E-07	0.000005623	0	-0.000005263	-5.921E-07	289-1

289	0	Gru1 Ult1.7	Combination	70.6652	0.000001078	0.000009669	0	6.196E-07	6.907E-08	289-1
289	0.5	Gru1 Ult1.7	Combination	71.4493	0.000001078	0.000009669	0	-0.000004215	-4.699E-07	289-1
289	1	Gru1 Ult1.7	Combination	72.2335	0.000001078	0.000009669	0	-0.00000905	-0.000001009	289-1
290	0	Grupo 1	Combination	29.411	-0.000009245	-0.00008218	0	-0.000005263	-5.921E-07	290-1
290	0.5	Grupo 1	Combination	30.0142	-0.000009245	-0.00008218	0	0.00003583	0.00000403	290-1
290	1	Grupo 1	Combination	30.6174	-0.000009245	-0.00008218	0	0.00007691	0.000008653	290-1
290	0	Gru1 Ult1.7	Combination	72.2335	-0.00001575	-0.0001413	0	-0.00000905	-0.000001009	290-1
290	0.5	Gru1 Ult1.7	Combination	73.0176	-0.00001575	-0.0001413	0	0.0000616	0.000006867	290-1
290	1	Gru1 Ult1.7	Combination	73.8017	-0.00001575	-0.0001413	0	0.00013	0.00001474	290-1
291	0	Grupo 1	Combination	30.6174	0.0001351	0.0012	0	0.00007691	0.000008653	291-1
291	0.5	Grupo 1	Combination	31.2206	0.0001351	0.0012	0	-0.00052	-0.00005891	291-1
291	1	Grupo 1	Combination	31.8237	0.0001351	0.0012	0	-0.00112	-0.00013	291-1
291	0	Gru1 Ult1.7	Combination	73.8017	0.0002302	0.0021	0	0.00013	0.00001474	291-1
291	0.5	Gru1 Ult1.7	Combination	74.5859	0.0002302	0.0021	0	-0.0009	-0.0001	291-1
291	1	Gru1 Ult1.7	Combination	75.37	0.0002302	0.0021	0	-0.00193	-0.00022	291-1
292	0	Grupo 1	Combination	31.8237	-0.002	-0.0176	0	-0.00112	-0.00013	292-1
292	0.5	Grupo 1	Combination	32.4269	-0.002	-0.0176	0	0.00765	0.00086	292-1
292	1	Grupo 1	Combination	33.0301	-0.002	-0.0176	0	0.01643	0.00185	292-1
292	0	Gru1 Ult1.7	Combination	75.37	-0.0034	-0.0302	0	-0.00193	-0.00022	292-1
292	0.5	Gru1 Ult1.7	Combination	76.1542	-0.0034	-0.0302	0	0.01316	0.00147	292-1
292	1	Gru1 Ult1.7	Combination	76.9383	-0.0034	-0.0302	0	0.02825	0.00315	292-1
293	0	Grupo 1	Combination	33.0301	0.0289	0.2566	0	0.01643	0.00185	293-1
293	0.5	Grupo 1	Combination	33.6333	0.0289	0.2566	0	-0.11186	-0.01258	293-1
293	1	Grupo 1	Combination	34.2365	0.0289	0.2566	0	-0.24014	-0.02702	293-1
293	0	Gru1 Ult1.7	Combination	76.9383	0.0492	0.4412	0	0.02825	0.00315	293-1
293	0.5	Gru1 Ult1.7	Combination	77.7224	0.0492	0.4412	0	-0.19234	-0.02144	293-1
293	1	Gru1 Ult1.7	Combination	78.5066	0.0492	0.4412	0	-0.41293	-0.04603	293-1
294	0	Grupo 1	Combination	34.2365	-0.4231	-3.7606	0	-0.24014	-0.02702	294-1
294	0.5	Grupo 1	Combination	34.8397	-0.4231	-3.7606	0	1.64017	0.18452	294-1
294	1	Grupo 1	Combination	35.4429	-0.4231	-3.7606	0	3.52047	0.39606	294-1
294	0	Gru1 Ult1.7	Combination	78.5066	-0.7208	-6.4665	0	-0.41293	-0.04603	294-1
294	0.5	Gru1 Ult1.7	Combination	79.2907	-0.7208	-6.4665	0	2.8203	0.31439	294-1
294	1	Gru1 Ult1.7	Combination	80.0749	-0.7208	-6.4665	0	6.05352	0.67481	294-1
295	0	Grupo 1	Combination	35.4429	6.1837	54.963	0	3.52047	0.39606	295-1
295	0.5	Grupo 1	Combination	36.046	6.1837	54.963	0	-23.96101	-2.69581	295-1
295	1	Grupo 1	Combination	36.6492	6.1837	54.963	0	-51.4425	-5.78768	295-1
295	0	Gru1 Ult1.7	Combination	80.0749	10.5358	94.5098	0	6.05352	0.67481	295-1
295	0.5	Gru1 Ult1.7	Combination	80.859	10.5358	94.5098	0	-41.20138	-4.59308	295-1
295	1	Gru1 Ult1.7	Combination	81.6432	10.5358	94.5098	0	-88.45629	-9.86097	295-1
296	0	Grupo 1	Combination	36.6492	-4.1102	-27.8496	0	-51.4425	-5.78768	296-1
296	0.5	Grupo 1	Combination	37.2524	-4.1102	-27.8496	0	-37.51771	-3.73259	296-1
296	1	Grupo 1	Combination	37.8556	-4.1102	-27.8496	0	-23.59292	-1.67751	296-1
296	0	Gru1 Ult1.7	Combination	81.6432	-7.0067	-47.6094	0	-88.45629	-9.86097	296-1
296	0.5	Gru1 Ult1.7	Combination	82.4273	-7.0067	-47.6094	0	-64.65158	-6.35761	296-1
296	1	Gru1 Ult1.7	Combination	83.2114	-7.0067	-47.6094	0	-40.84688	-2.85425	296-1

297	0	Grupo 1	Combination	37.8556	-4.1102	-27.8496	2.22E-16	-23.59292	-1.67751	297-1
297	0.5	Grupo 1	Combination	38.4588	-4.1102	-27.8496	2.22E-16	-9.66812	0.37758	297-1
297	1	Grupo 1	Combination	39.062	-4.1102	-27.8496	2.22E-16	4.25667	2.43267	297-1
297	0	Gru1 Ult1.7	Combination	83.2114	-7.0067	-47.6094	3.775E-16	-40.84688	-2.85425	297-1
297	0.5	Gru1 Ult1.7	Combination	83.9956	-7.0067	-47.6094	3.775E-16	-17.04217	0.64911	297-1
297	1	Gru1 Ult1.7	Combination	84.7797	-7.0067	-47.6094	3.775E-16	6.76253	4.15247	297-1
298	0	Grupo 1	Combination	39.062	-4.1102	-27.8496	5.997E-15	4.25667	2.43267	298-1
298	0.5	Grupo 1	Combination	39.6652	-4.1102	-27.8496	5.997E-15	18.18147	4.48776	298-1
298	1	Grupo 1	Combination	40.2683	-4.1102	-27.8496	5.997E-15	32.10626	6.54285	298-1
298	0	Gru1 Ult1.7	Combination	84.7797	-7.0067	-47.6094	1.019E-14	6.76253	4.15247	298-1
298	0.5	Gru1 Ult1.7	Combination	85.5639	-7.0067	-47.6094	1.019E-14	30.56724	7.65583	298-1
298	1	Gru1 Ult1.7	Combination	86.348	-7.0067	-47.6094	1.019E-14	54.37194	11.15919	298-1
299	0	Grupo 1	Combination	10.7579	0	-1.523E-16	0	0	0	299-1
299	0.5	Grupo 1	Combination	11.3611	0	-1.523E-16	0	7.616E-17	0	299-1
299	1	Grupo 1	Combination	11.9642	0	-1.523E-16	0	1.523E-16	0	299-1
299	0	Gru1 Ult1.7	Combination	45.3024	0	-2.623E-16	0	0	0	299-1
299	0.5	Gru1 Ult1.7	Combination	46.0865	0	-2.623E-16	0	1.312E-16	0	299-1
299	1	Gru1 Ult1.7	Combination	46.8707	0	-2.623E-16	0	2.623E-16	0	299-1
300	0	Grupo 1	Combination	11.9642	0	2.387E-15	0	1.523E-16	0	300-1
300	0.5	Grupo 1	Combination	12.5674	0	2.387E-15	0	-1.041E-15	0	300-1
300	1	Grupo 1	Combination	13.1706	0	2.387E-15	0	-2.235E-15	0	300-1
300	0	Gru1 Ult1.7	Combination	46.8707	0	4.112E-15	0	2.623E-16	0	300-1
300	0.5	Gru1 Ult1.7	Combination	47.6548	0	4.112E-15	0	-1.793E-15	0	300-1
300	1	Gru1 Ult1.7	Combination	48.4389	0	4.112E-15	0	-3.849E-15	0	300-1
301	0	Grupo 1	Combination	13.1706	0	-3.488E-14	0	-2.235E-15	0	301-1
301	0.5	Grupo 1	Combination	13.7738	0	-3.488E-14	0	1.52E-14	0	301-1
301	1	Grupo 1	Combination	14.377	0	-3.488E-14	0	3.264E-14	0	301-1
301	0	Gru1 Ult1.7	Combination	48.4389	0	-6.007E-14	0	-3.849E-15	0	301-1
301	0.5	Gru1 Ult1.7	Combination	49.2231	0	-6.007E-14	0	2.618E-14	0	301-1
301	1	Gru1 Ult1.7	Combination	50.0072	0	-6.007E-14	0	5.622E-14	0	301-1
302	0	Grupo 1	Combination	14.377	0	5.094E-13	0	3.264E-14	0	302-1
302	0.5	Grupo 1	Combination	14.9802	0	5.094E-13	0	-2.22E-13	0	302-1
302	1	Grupo 1	Combination	15.5834	0	5.094E-13	0	-4.767E-13	0	302-1
302	0	Gru1 Ult1.7	Combination	50.0072	0	8.772E-13	0	5.622E-14	0	302-1
302	0.5	Gru1 Ult1.7	Combination	50.7914	0	8.772E-13	0	-3.824E-13	0	302-1
302	1	Gru1 Ult1.7	Combination	51.5755	0	8.772E-13	0	-8.21E-13	0	302-1
303	0	Grupo 1	Combination	15.5834	0	-7.439E-12	0	-4.767E-13	0	303-1
303	0.5	Grupo 1	Combination	16.1865	0	-7.439E-12	0	3.243E-12	0	303-1
303	1	Grupo 1	Combination	16.7897	0	-7.439E-12	0	6.962E-12	0	303-1
303	0	Gru1 Ult1.7	Combination	51.5755	0	-1.281E-11	0	-8.21E-13	0	303-1
303	0.5	Gru1 Ult1.7	Combination	52.3597	0	-1.281E-11	0	5.585E-12	0	303-1
303	1	Gru1 Ult1.7	Combination	53.1438	0	-1.281E-11	0	1.199E-11	0	303-1
304	0	Grupo 1	Combination	16.7897	0	1.086E-10	0	6.962E-12	0	304-1
304	0.5	Grupo 1	Combination	17.3929	0	1.086E-10	0	-4.736E-11	0	304-1
304	1	Grupo 1	Combination	17.9961	0	1.086E-10	0	-1.017E-10	0	304-1

304	0	Gru1 Ult1.7	Combination	53.1438	0	1.871E-10	0	1.199E-11	0	304-1
304	0.5	Gru1 Ult1.7	Combination	53.9279	0	1.871E-10	0	-8.156E-11	0	304-1
304	1	Gru1 Ult1.7	Combination	54.7121	0	1.871E-10	0	-1.751E-10	0	304-1
305	0	Grupo 1	Combination	17.9961	0	-1.587E-09	0	-1.017E-10	0	305-1
305	0.5	Grupo 1	Combination	18.5993	0	-1.587E-09	0	6.917E-10	0	305-1
305	1	Grupo 1	Combination	19.2025	0	-1.587E-09	0	1.485E-09	0	305-1
305	0	Gru1 Ult1.7	Combination	54.7121	0	-2.733E-09	0	-1.751E-10	0	305-1
305	0.5	Gru1 Ult1.7	Combination	55.4962	0	-2.733E-09	0	1.191E-09	0	305-1
305	1	Gru1 Ult1.7	Combination	56.2804	0	-2.733E-09	0	2.557E-09	0	305-1
306	0	Grupo 1	Combination	19.2025	0	2.317E-08	0	1.485E-09	0	306-1
306	0.5	Grupo 1	Combination	19.8057	0	2.317E-08	0	-1.01E-08	0	306-1
306	1	Grupo 1	Combination	20.4088	0	2.317E-08	0	-2.169E-08	0	306-1
306	0	Gru1 Ult1.7	Combination	56.2804	0	3.991E-08	0	2.557E-09	0	306-1
306	0.5	Gru1 Ult1.7	Combination	57.0645	0	3.991E-08	0	-1.74E-08	0	306-1
306	1	Gru1 Ult1.7	Combination	57.8486	0	3.991E-08	0	-3.735E-08	0	306-1
307	0	Grupo 1	Combination	20.4088	0	-3.384E-07	0	-2.169E-08	0	307-1
307	0.5	Grupo 1	Combination	21.012	0	-3.384E-07	0	1.475E-07	0	307-1
307	1	Grupo 1	Combination	21.6152	0	-3.384E-07	0	3.167E-07	0	307-1
307	0	Gru1 Ult1.7	Combination	57.8486	0	-5.828E-07	0	-3.735E-08	0	307-1
307	0.5	Gru1 Ult1.7	Combination	58.6328	0	-5.828E-07	0	2.541E-07	0	307-1
307	1	Gru1 Ult1.7	Combination	59.4169	0	-5.828E-07	0	5.455E-07	0	307-1
308	0	Grupo 1	Combination	21.6152	-1.044E-19	0.000004943	0	3.167E-07	0	308-1
308	0.5	Grupo 1	Combination	22.2184	-1.044E-19	0.000004943	0	-0.000002155	4.553E-20	308-1
308	1	Grupo 1	Combination	22.8216	-1.044E-19	0.000004943	0	-0.000004626	9.775E-20	308-1
308	0	Gru1 Ult1.7	Combination	59.4169	-1.429E-19	0.000008512	0	5.455E-07	0	308-1
308	0.5	Gru1 Ult1.7	Combination	60.2011	-1.429E-19	0.000008512	0	-0.00000371	6.229E-20	308-1
308	1	Gru1 Ult1.7	Combination	60.9852	-1.429E-19	0.000008512	0	-0.000007966	1.337E-19	308-1
309	0	Grupo 1	Combination	22.8216	1.526E-18	-0.00007223	0	-0.000004626	9.775E-20	309-1
309	0.5	Grupo 1	Combination	23.4248	1.526E-18	-0.00007223	0	0.00003149	-6.654E-19	309-1
309	1	Grupo 1	Combination	24.028	1.526E-18	-0.00007223	0	0.0000676	-1.429E-18	309-1
309	0	Gru1 Ult1.7	Combination	60.9852	2.088E-18	-0.0001244	0	-0.000007966	1.337E-19	309-1
309	0.5	Gru1 Ult1.7	Combination	61.7694	2.088E-18	-0.0001244	0	0.00005423	-9.103E-19	309-1
309	1	Gru1 Ult1.7	Combination	62.5535	2.088E-18	-0.0001244	0	0.00012	-1.954E-18	309-1
310	0	Grupo 1	Combination	24.028	-2.231E-17	0.0011	0	0.0000676	-1.429E-18	310-1
310	0.5	Grupo 1	Combination	24.6311	-2.231E-17	0.0011	0	-0.00046	9.726E-18	310-1
310	1	Grupo 1	Combination	25.2343	-2.231E-17	0.0011	0	-0.00099	2.088E-17	310-1
310	0	Gru1 Ult1.7	Combination	62.5535	-3.052E-17	0.0018	0	0.00012	-1.954E-18	310-1
310	0.5	Gru1 Ult1.7	Combination	63.3376	-3.052E-17	0.0018	0	-0.00079	1.33E-17	310-1
310	1	Gru1 Ult1.7	Combination	64.1218	-3.052E-17	0.0018	0	-0.0017	2.856E-17	310-1
311	0	Grupo 1	Combination	25.2343	3.261E-16	-0.0154	0	-0.00099	2.088E-17	311-1
311	0.5	Grupo 1	Combination	25.8375	3.261E-16	-0.0154	0	0.00673	-1.421E-16	311-1
311	1	Grupo 1	Combination	26.4407	3.261E-16	-0.0154	0	0.01444	-3.052E-16	311-1
311	0	Gru1 Ult1.7	Combination	64.1218	4.46E-16	-0.0266	0	-0.0017	2.856E-17	311-1
311	0.5	Gru1 Ult1.7	Combination	64.9059	4.46E-16	-0.0266	0	0.01158	-1.945E-16	311-1
311	1	Gru1 Ult1.7	Combination	65.6901	4.46E-16	-0.0266	0	0.02487	-4.175E-16	311-1

312	0	Grupo 1	Combination	26.4407	-4.766E-15	0.2255	0	0.01444	-3.052E-16	312-1
312	0.5	Grupo 1	Combination	27.0439	-4.766E-15	0.2255	0	-0.09832	2.078E-15	312-1
312	1	Grupo 1	Combination	27.6471	-4.766E-15	0.2255	0	-0.21107	4.46E-15	312-1
312	0	Gru1 Ult1.7	Combination	65.6901	-6.519E-15	0.3884	0	0.02487	-4.175E-16	312-1
312	0.5	Gru1 Ult1.7	Combination	66.4742	-6.519E-15	0.3884	0	-0.16932	2.842E-15	312-1
312	1	Gru1 Ult1.7	Combination	67.2583	-6.519E-15	0.3884	0	-0.3635	6.102E-15	312-1
313	0	Grupo 1	Combination	27.6471	6.985E-14	-3.3054	0	-0.21107	4.46E-15	313-1
313	0.5	Grupo 1	Combination	28.2503	6.985E-14	-3.3054	0	1.44163	-3.046E-14	313-1
313	1	Grupo 1	Combination	28.8534	6.985E-14	-3.3054	0	3.09433	-6.539E-14	313-1
313	0	Gru1 Ult1.7	Combination	67.2583	9.556E-14	-5.6925	0	-0.3635	6.102E-15	313-1
313	0.5	Gru1 Ult1.7	Combination	68.0425	9.556E-14	-5.6925	0	2.48273	-4.168E-14	313-1
313	1	Gru1 Ult1.7	Combination	68.8266	9.556E-14	-5.6925	0	5.32897	-8.945E-14	313-1
314	0	Grupo 1	Combination	28.8534	-1.021E-12	48.3097	0	3.09433	-6.539E-14	314-1
314	0.5	Grupo 1	Combination	29.4566	-1.021E-12	48.3097	0	-21.06052	4.45E-13	314-1
314	1	Grupo 1	Combination	30.0598	-1.021E-12	48.3097	0	-45.21538	9.555E-13	314-1
314	0	Gru1 Ult1.7	Combination	68.8266	-1.397E-12	83.1978	0	5.32897	-8.945E-14	314-1
314	0.5	Gru1 Ult1.7	Combination	69.6108	-1.397E-12	83.1978	0	-36.26991	6.088E-13	314-1
314	1	Gru1 Ult1.7	Combination	70.3949	-1.397E-12	83.1978	0	-77.86879	1.307E-12	314-1
315	0	Grupo 1	Combination	30.0598	4.119E-13	-24.1424	0	-45.21538	9.555E-13	315-1
315	0.5	Grupo 1	Combination	30.663	4.119E-13	-24.1424	0	-33.14416	7.495E-13	315-1
315	1	Grupo 1	Combination	31.2662	4.119E-13	-24.1424	0	-21.07294	5.435E-13	315-1
315	0	Gru1 Ult1.7	Combination	70.3949	5.814E-13	-41.3053	0	-77.86879	1.307E-12	315-1
315	0.5	Gru1 Ult1.7	Combination	71.1791	5.814E-13	-41.3053	0	-57.21613	1.016E-12	315-1
315	1	Gru1 Ult1.7	Combination	71.9632	5.814E-13	-41.3053	0	-36.56346	7.257E-13	315-1
316	0	Grupo 1	Combination	31.2662	4.119E-13	-24.1424	0	-21.07294	5.435E-13	316-1
316	0.5	Grupo 1	Combination	31.8694	4.119E-13	-24.1424	0	-9.00172	3.376E-13	316-1
316	1	Grupo 1	Combination	32.4726	4.119E-13	-24.1424	0	3.06949	1.316E-13	316-1
316	0	Gru1 Ult1.7	Combination	71.9632	5.814E-13	-41.3053	0	-36.56346	7.257E-13	316-1
316	0.5	Gru1 Ult1.7	Combination	72.7473	5.814E-13	-41.3053	0	-15.9108	4.351E-13	316-1
316	1	Gru1 Ult1.7	Combination	73.5315	5.814E-13	-41.3053	0	4.74186	1.444E-13	316-1
317	0	Grupo 1	Combination	32.4726	4.119E-13	-24.1424	0	3.06949	1.316E-13	317-1
317	0.5	Grupo 1	Combination	33.0757	4.119E-13	-24.1424	0	15.14071	-7.436E-14	317-1
317	1	Grupo 1	Combination	33.6789	4.119E-13	-24.1424	0	27.21193	-2.803E-13	317-1
317	0	Gru1 Ult1.7	Combination	73.5315	5.814E-13	-41.3053	0	4.74186	1.444E-13	317-1
317	0.5	Gru1 Ult1.7	Combination	74.3156	5.814E-13	-41.3053	0	25.39453	-1.463E-13	317-1
317	1	Gru1 Ult1.7	Combination	75.0998	5.814E-13	-41.3053	0	46.04719	-4.37E-13	317-1
318	0	Grupo 1	Combination	17.3473	1.95E-17	-1.733E-16	0	0	0	318-1
318	0.5	Grupo 1	Combination	17.9505	1.95E-17	-1.733E-16	0	8.665E-17	-9.749E-18	318-1
318	1	Grupo 1	Combination	18.5536	1.95E-17	-1.733E-16	0	1.733E-16	-1.95E-17	318-1
318	0	Gru1 Ult1.7	Combination	56.5506	3.322E-17	-2.98E-16	0	0	0	318-1
318	0.5	Gru1 Ult1.7	Combination	57.3348	3.322E-17	-2.98E-16	0	1.49E-16	-1.661E-17	318-1
318	1	Gru1 Ult1.7	Combination	58.1189	3.322E-17	-2.98E-16	0	2.98E-16	-3.322E-17	318-1
319	0	Grupo 1	Combination	18.5536	-3.056E-16	2.716E-15	0	1.733E-16	-1.95E-17	319-1
319	0.5	Grupo 1	Combination	19.1568	-3.056E-16	2.716E-15	0	-1.185E-15	1.333E-16	319-1
319	1	Grupo 1	Combination	19.76	-3.056E-16	2.716E-15	0	-2.543E-15	2.861E-16	319-1

319	0	Gru1 Ult1.7	Combination	58.1189	-5.207E-16	4.671E-15	0	2.98E-16	-3.322E-17	319-1
319	0.5	Gru1 Ult1.7	Combination	58.9031	-5.207E-16	4.671E-15	0	-2.037E-15	2.271E-16	319-1
319	1	Gru1 Ult1.7	Combination	59.6872	-5.207E-16	4.671E-15	0	-4.373E-15	4.874E-16	319-1
320	0	Grupo 1	Combination	19.76	4.464E-15	-3.968E-14	1.998E-15	-2.543E-15	2.861E-16	320-1
320	0.5	Grupo 1	Combination	20.3632	4.464E-15	-3.968E-14	1.998E-15	1.73E-14	-1.946E-15	320-1
320	1	Grupo 1	Combination	20.9664	4.464E-15	-3.968E-14	1.998E-15	3.714E-14	-4.178E-15	320-1
320	0	Gru1 Ult1.7	Combination	59.6872	7.606E-15	-6.823E-14	3.397E-15	-4.373E-15	4.874E-16	320-1
320	0.5	Gru1 Ult1.7	Combination	60.4713	7.606E-15	-6.823E-14	3.397E-15	2.974E-14	-3.316E-15	320-1
320	1	Gru1 Ult1.7	Combination	61.2555	7.606E-15	-6.823E-14	3.397E-15	6.386E-14	-7.119E-15	320-1
321	0	Grupo 1	Combination	20.9664	-6.52E-14	5.795E-13	4.337E-19	3.714E-14	-4.178E-15	321-1
321	0.5	Grupo 1	Combination	21.5696	-6.52E-14	5.795E-13	4.337E-19	-2.526E-13	2.842E-14	321-1
321	1	Grupo 1	Combination	22.1728	-6.52E-14	5.795E-13	4.337E-19	-5.424E-13	6.102E-14	321-1
321	0	Gru1 Ult1.7	Combination	61.2555	-1.111E-13	9.965E-13	5.638E-19	6.386E-14	-7.119E-15	321-1
321	0.5	Gru1 Ult1.7	Combination	62.0396	-1.111E-13	9.965E-13	5.638E-19	-4.344E-13	4.842E-14	321-1
321	1	Gru1 Ult1.7	Combination	62.8238	-1.111E-13	9.965E-13	5.638E-19	-9.327E-13	1.04E-13	321-1
322	0	Grupo 1	Combination	22.1728	9.522E-13	-8.464E-12	4.337E-19	-5.424E-13	6.102E-14	322-1
322	0.5	Grupo 1	Combination	22.7759	9.522E-13	-8.464E-12	4.337E-19	3.689E-12	-4.151E-13	322-1
322	1	Grupo 1	Combination	23.3791	9.522E-13	-8.464E-12	4.337E-19	7.921E-12	-8.912E-13	322-1
322	0	Gru1 Ult1.7	Combination	62.8238	1.622E-12	-1.455E-11	5.638E-19	-9.327E-13	1.04E-13	322-1
322	0.5	Gru1 Ult1.7	Combination	63.6079	1.622E-12	-1.455E-11	5.638E-19	6.344E-12	-7.072E-13	322-1
322	1	Gru1 Ult1.7	Combination	64.392	1.622E-12	-1.455E-11	5.638E-19	1.362E-11	-1.518E-12	322-1
323	0	Grupo 1	Combination	23.3791	-1.391E-11	1.236E-10	0	7.921E-12	-8.912E-13	323-1
323	0.5	Grupo 1	Combination	23.9823	-1.391E-11	1.236E-10	0	-5.388E-11	6.062E-12	323-1
323	1	Grupo 1	Combination	24.5855	-1.391E-11	1.236E-10	0	-1.157E-10	1.302E-11	323-1
323	0	Gru1 Ult1.7	Combination	64.392	-2.369E-11	2.125E-10	0	1.362E-11	-1.518E-12	323-1
323	0.5	Gru1 Ult1.7	Combination	65.1762	-2.369E-11	2.125E-10	0	-9.265E-11	1.033E-11	323-1
323	1	Gru1 Ult1.7	Combination	65.9603	-2.369E-11	2.125E-10	0	-1.989E-10	2.217E-11	323-1
324	0	Grupo 1	Combination	24.5855	2.031E-10	-1.805E-09	0	-1.157E-10	1.302E-11	324-1
324	0.5	Grupo 1	Combination	25.1887	2.031E-10	-1.805E-09	0	7.869E-10	-8.853E-11	324-1
324	1	Grupo 1	Combination	25.7919	2.031E-10	-1.805E-09	0	1.69E-09	-1.901E-10	324-1
324	0	Gru1 Ult1.7	Combination	65.9603	3.46E-10	-3.104E-09	0	-1.989E-10	2.217E-11	324-1
324	0.5	Gru1 Ult1.7	Combination	66.7445	3.46E-10	-3.104E-09	0	1.353E-09	-1.508E-10	324-1
324	1	Gru1 Ult1.7	Combination	67.5286	3.46E-10	-3.104E-09	0	2.905E-09	-3.239E-10	324-1
325	0	Grupo 1	Combination	25.7919	-2.966E-09	2.636E-08	2.22E-16	1.69E-09	-1.901E-10	325-1
325	0.5	Grupo 1	Combination	26.3951	-2.966E-09	2.636E-08	2.22E-16	-1.149E-08	1.293E-09	325-1
325	1	Grupo 1	Combination	26.9982	-2.966E-09	2.636E-08	2.22E-16	-2.467E-08	2.776E-09	325-1
325	0	Gru1 Ult1.7	Combination	67.5286	-5.054E-09	4.533E-08	3.775E-16	2.905E-09	-3.239E-10	325-1
325	0.5	Gru1 Ult1.7	Combination	68.3127	-5.054E-09	4.533E-08	3.775E-16	-1.976E-08	2.203E-09	325-1
325	1	Gru1 Ult1.7	Combination	69.0969	-5.054E-09	4.533E-08	3.775E-16	-4.243E-08	4.73E-09	325-1
326	0	Grupo 1	Combination	26.9982	4.332E-08	-0.000000385	2.22E-16	-2.467E-08	2.776E-09	326-1
326	0.5	Grupo 1	Combination	27.6014	4.332E-08	-0.000000385	2.22E-16	1.678E-07	-1.888E-08	326-1
326	1	Grupo 1	Combination	28.2046	4.332E-08	-0.000000385	2.22E-16	3.604E-07	-4.054E-08	326-1
326	0	Gru1 Ult1.7	Combination	69.0969	7.38E-08	-6.621E-07	3.775E-16	-4.243E-08	4.73E-09	326-1
326	0.5	Gru1 Ult1.7	Combination	69.881	7.38E-08	-6.621E-07	3.775E-16	2.886E-07	-3.217E-08	326-1
326	1	Gru1 Ult1.7	Combination	70.6652	7.38E-08	-6.621E-07	3.775E-16	6.196E-07	-6.907E-08	326-1

327	0	Grupo 1	Combination	28.2046	-6.326E-07	0.000005623	0	3.604E-07	-4.054E-08	327-1
327	0.5	Grupo 1	Combination	28.8078	-6.326E-07	0.000005623	0	-0.000002451	2.758E-07	327-1
327	1	Grupo 1	Combination	29.411	-6.326E-07	0.000005623	0	-0.000005263	5.921E-07	327-1
327	0	Gru1 Ult1.7	Combination	70.6652	-0.000001078	0.000009669	0	6.196E-07	-6.907E-08	327-1
327	0.5	Gru1 Ult1.7	Combination	71.4493	-0.000001078	0.000009669	0	-0.000004215	4.699E-07	327-1
327	1	Gru1 Ult1.7	Combination	72.2335	-0.000001078	0.000009669	0	-0.00000905	0.000001009	327-1
328	0	Grupo 1	Combination	29.411	0.000009245	-0.00008218	0	-0.000005263	5.921E-07	328-1
328	0.5	Grupo 1	Combination	30.0142	0.000009245	-0.00008218	0	0.00003583	-0.00000403	328-1
328	1	Grupo 1	Combination	30.6174	0.000009245	-0.00008218	0	0.00007691	-0.000008653	328-1
328	0	Gru1 Ult1.7	Combination	72.2335	0.00001575	-0.0001413	0	-0.00000905	0.000001009	328-1
328	0.5	Gru1 Ult1.7	Combination	73.0176	0.00001575	-0.0001413	0	0.0000616	-0.000006867	328-1
328	1	Gru1 Ult1.7	Combination	73.8017	0.00001575	-0.0001413	0	0.00013	-0.00001474	328-1
329	0	Grupo 1	Combination	30.6174	-0.0001351	0.0012	0	0.00007691	-0.000008653	329-1
329	0.5	Grupo 1	Combination	31.2206	-0.0001351	0.0012	0	-0.00052	0.00005891	329-1
329	1	Grupo 1	Combination	31.8237	-0.0001351	0.0012	0	-0.00112	0.00013	329-1
329	0	Gru1 Ult1.7	Combination	73.8017	-0.0002302	0.0021	0	0.00013	-0.00001474	329-1
329	0.5	Gru1 Ult1.7	Combination	74.5859	-0.0002302	0.0021	0	-0.0009	0.0001	329-1
329	1	Gru1 Ult1.7	Combination	75.37	-0.0002302	0.0021	0	-0.00193	0.00022	329-1
330	0	Grupo 1	Combination	31.8237	0.002	-0.0176	0	-0.00112	0.00013	330-1
330	0.5	Grupo 1	Combination	32.4269	0.002	-0.0176	0	0.00765	-0.00086	330-1
330	1	Grupo 1	Combination	33.0301	0.002	-0.0176	0	0.01643	-0.00185	330-1
330	0	Gru1 Ult1.7	Combination	75.37	0.0034	-0.0302	0	-0.00193	0.00022	330-1
330	0.5	Gru1 Ult1.7	Combination	76.1542	0.0034	-0.0302	0	0.01316	-0.00147	330-1
330	1	Gru1 Ult1.7	Combination	76.9383	0.0034	-0.0302	0	0.02825	-0.00315	330-1
331	0	Grupo 1	Combination	33.0301	-0.0289	0.2566	0	0.01643	-0.00185	331-1
331	0.5	Grupo 1	Combination	33.6333	-0.0289	0.2566	0	-0.11186	0.01258	331-1
331	1	Grupo 1	Combination	34.2365	-0.0289	0.2566	0	-0.24014	0.02702	331-1
331	0	Gru1 Ult1.7	Combination	76.9383	-0.0492	0.4412	0	0.02825	-0.00315	331-1
331	0.5	Gru1 Ult1.7	Combination	77.7224	-0.0492	0.4412	0	-0.19234	0.02144	331-1
331	1	Gru1 Ult1.7	Combination	78.5066	-0.0492	0.4412	0	-0.41293	0.04603	331-1
332	0	Grupo 1	Combination	34.2365	0.4231	-3.7606	0	-0.24014	0.02702	332-1
332	0.5	Grupo 1	Combination	34.8397	0.4231	-3.7606	0	1.64017	-0.18452	332-1
332	1	Grupo 1	Combination	35.4429	0.4231	-3.7606	0	3.52047	-0.39606	332-1
332	0	Gru1 Ult1.7	Combination	78.5066	0.7208	-6.4665	0	-0.41293	0.04603	332-1
332	0.5	Gru1 Ult1.7	Combination	79.2907	0.7208	-6.4665	0	2.8203	-0.31439	332-1
332	1	Gru1 Ult1.7	Combination	80.0749	0.7208	-6.4665	0	6.05352	-0.67481	332-1
333	0	Grupo 1	Combination	35.4429	-6.1837	54.963	0	3.52047	-0.39606	333-1
333	0.5	Grupo 1	Combination	36.046	-6.1837	54.963	0	-23.96101	2.69581	333-1
333	1	Grupo 1	Combination	36.6492	-6.1837	54.963	0	-51.4425	5.78768	333-1
333	0	Gru1 Ult1.7	Combination	80.0749	-10.5358	94.5098	0	6.05352	-0.67481	333-1
333	0.5	Gru1 Ult1.7	Combination	80.859	-10.5358	94.5098	0	-41.20138	4.59308	333-1
333	1	Gru1 Ult1.7	Combination	81.6432	-10.5358	94.5098	0	-88.45629	9.86097	333-1
334	0	Grupo 1	Combination	36.6492	4.1102	-27.8496	0	-51.4425	5.78768	334-1
334	0.5	Grupo 1	Combination	37.2524	4.1102	-27.8496	0	-37.51771	3.73259	334-1
334	1	Grupo 1	Combination	37.8556	4.1102	-27.8496	0	-23.59292	1.67751	334-1

334	0	Gru1 Ult1.7	Combination	81.6432	7.0067	-47.6094	0	-88.45629	9.86097	334-1
334	0.5	Gru1 Ult1.7	Combination	82.4273	7.0067	-47.6094	0	-64.65158	6.35761	334-1
334	1	Gru1 Ult1.7	Combination	83.2114	7.0067	-47.6094	0	-40.84688	2.85425	334-1
335	0	Grupo 1	Combination	37.8556	4.1102	-27.8496	-2.22E-15	-23.59292	1.67751	335-1
335	0.5	Grupo 1	Combination	38.4588	4.1102	-27.8496	-2.22E-15	-9.66812	-0.37758	335-1
335	1	Grupo 1	Combination	39.062	4.1102	-27.8496	-2.22E-15	4.25667	-2.43267	335-1
335	0	Gru1 Ult1.7	Combination	83.2114	7.0067	-47.6094	-3.775E-15	-40.84688	2.85425	335-1
335	0.5	Gru1 Ult1.7	Combination	83.9956	7.0067	-47.6094	-3.775E-15	-17.04217	-0.64911	335-1
335	1	Gru1 Ult1.7	Combination	84.7797	7.0067	-47.6094	-3.775E-15	6.76253	-4.15247	335-1
336	0	Grupo 1	Combination	39.062	4.1102	-27.8496	-6.219E-15	4.25667	-2.43267	336-1
336	0.5	Grupo 1	Combination	39.6652	4.1102	-27.8496	-6.219E-15	18.18147	-4.48776	336-1
336	1	Grupo 1	Combination	40.2683	4.1102	-27.8496	-6.219E-15	32.10626	-6.54285	336-1
336	0	Gru1 Ult1.7	Combination	84.7797	7.0067	-47.6094	-1.057E-14	6.76253	-4.15247	336-1
336	0.5	Gru1 Ult1.7	Combination	85.5639	7.0067	-47.6094	-1.057E-14	30.56724	-7.65583	336-1
336	1	Gru1 Ult1.7	Combination	86.348	7.0067	-47.6094	-1.057E-14	54.37194	-11.15919	336-1